



2022
ESG Report

CHINA TOWER CORPORATION LIMITED
中國鐵塔股份有限公司



ABOUT THE REPORT

Introduction

This Report seeks to disclose information regarding the environmental, social and governance (ESG) performance of China Tower Corporation Limited (hereinafter referred to as “China Tower”, “Company”, “we” or “us”) in 2022. This Report is prepared in accordance with Appendix 27 “Environmental, Social and Governance Reporting Guide” (“ESG Reporting Guide”) to the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (“Listing Rules”) to help stakeholders acquire a better understanding of China Tower.

Scope of Report

The organizations covered by this Report include China Tower Corporation Limited, as well as its subordinate companies. Compared with the ESG reports of the Company in previous years, this Report made no major adjustment to the scope of disclosure and used consistent statistical methods. The statistical scope of the data covered by the report is indicated herein, and the data calculation is performed according to national regulations or international standards. The amounts reported in this report are denominated in Renminbi unless otherwise specified.

Reporting Period

The reporting period of this Report is from 1 January 2022 to 31 December 2022 (hereinafter referred to as “This Year”). Certain information contained herein may concern events, etc. occurred before or after the reporting period to make this Report more relevant and complete.

Reference Guide

The content of this Report conforms to Appendix 27 “ESG Reporting Guide” to the Listing Rules issued by the Hong Kong Stock Exchange, and is compiled in accordance with the principles of materiality, quantification, balance and consistency, as indexed in the Appendix of this Report.

“Materiality” principle:



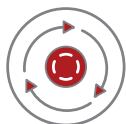
During the preparation of this Report, major stakeholders and ESG issues of concern have been identified, and targeted disclosures have been made in this Report according to the importance of their concerns.

“Quantitative” principle:



This Report uses quantitative data to present key performance indicators at the environmental and social level. The measurement standards, methods, assumptions and/or calculation tools for the key performance indicators in this Report, as well as the sources of conversion coefficients used have been explained correspondingly.

“Consistency” principle:



Unless otherwise stated, this Report applies the same statistical method with the 2021 Environmental, Social and Governance Report of the Company.

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Chairman's Statement >>



Zhang Zhiyong

Chairman of the Board

2022 was an important year for China Tower as we implemented the "14th Five-Year Plan", as well as the "Cyberpower", "Digital China" and "dual carbon" strategies. During the past year, we kept in mind the country's most fundamental interests, and took our role as a National Team in driving the country's wireless communications infrastructure and Main Force in 5G new infrastructure. With the implementation of new development philosophy in mind, we will faithfully fulfill our corporate social and economic responsibilities, deepening resource sharing, supporting the new infrastructure, transforming from "telecommunication towers" to "digital towers", and developing a specialized Energy business, while contributing to the "Cyberpower" and "Digital China" strategy and building a Beautiful China.

Continued to deepen resource sharing, laying a strong foundation for the "Cyberpower" strategy.

Through coordinating resources and constructions as well as deepening our sharing philosophy, we had cumulatively completed the constructions of over 3.6 million projects related to telecommunication towers, with the cumulative number of 5G base-stations reaching 1.761 million, as of the end of 2022. Our indoor distributed antenna systems (DAS) had covered high-speed railway tunnels and subways with a cumulative length of about 20,040.2 kilometers and buildings of 7,390 million square meters. Through these efforts, we supported China in building the world's largest and best-quality wireless broadband network and achieving global leadership in 5G coverage. We adhered to the principle of "prioritizing co-location and sticking to sharing philosophy in building up new sites", resulting in our site co-location rate increasing to 83% as of the end of 2022 from the lowest point of 14% in the history of our industry. With continuous efforts to create shared benefits through resource sharing, we managed to cut out 980,000 newly built towers, saving RMB176 billion in investment for the industry, and reducing land use by 55,000 mu and carbon emissions by nearly 26 million tons, further unleashing the benefits of resource sharing.

Developed digital towers to better support "Digital China".

We helped build the 5G network while moving beyond sharing within the industry to the social sharing of resources. We have been transforming "telecommunication towers" into "digital towers" and developing a unified and open Tower Monitoring platform in China centering visual sensor, data collection, information processing and other digital governance demands. By converting over 200,000 telecommunication towers into digital towers, we provided support for over 40 sectors including environment protection, meteorology, emergency service, public security and navigation etc., and contributed to the development of "Digital China" and the Internet of Everything.

Deepened energy sharing to support green and low-carbon transition.

In response to the requirements to achieve the nation's carbon peaking and carbon neutrality, we prioritized telecommunications infrastructure sharing, construction solution innovation, technological upgrades, product optimization, resource recycling and reuse, construction pollution control, and the building of clean energy-powered sites. By doing so, we continued to make progress in energy saving and carbon reduction. We utilized distributed power grids, distributed energy storage systems, and professional operating and maintenance capabilities to accelerate the application of smart battery exchange, power backup, power charging, and the cascade use of retired electric vehicles' batteries across the country. As of the end of 2022, we had deployed 57,000 battery exchange points across over 280 cities, providing battery exchange services over 900 million times for more than 900,000 food and parcel delivery drivers. Additionally, we had set up more than 1.5 million charging ports, providing secure and convenient electric bike charging for nearly 10 million residents.



Pursued innovation to unleash internal vitality and impetus.

With the goal of building a world-class enterprise with excellent products, distinguished brands, leading innovation, and modern governance, we continually benchmarked ourselves against the best enterprises in the world to improve our flat and efficient organizational structure and systems, and our Internet-based management model. Furthermore, we developed our own strategy to address the “14th Five-Year Plan” through technological innovation to facilitate more coordinated planning and achieve more breakthroughs in key technologies. As a result, we launched a series of innovative products and solutions, and created stronger momentum in our development into a technology- and innovation-focused enterprise. In addition, we integrated digitization into our entire production process and operations, making solid progress in key areas including intelligent operation and maintenance, one-code-for-all service, digital governance, and electronic billing, further enhancing our operating efficiency.

Committed to fulfilling corporate social responsibility.

By stepping up our efforts in developing the telecommunications infrastructure in remote areas and poor villages and towns, we collaborated with telecommunications service providers to construct around 60,000 universal service sites, helping to achieve over 99% 4G coverage in villages and narrowing the “Digital Divide” between the eastern and western regions for a more balanced communications network. We were aware of the dynamics between poverty eradication and rural revitalization strategies. Therefore, we remained focused on leveraging our resources, businesses, technology, and talent advantages, and on providing more support to 24 provinces and 98 counties (villages). This has resulted in better outcomes in rural revitalization. Additionally, we continued to actively fulfill our responsibility and obligation to provide secure communications for emergency rescues and major events. We have won wide recognition for providing reliable communications at significant events such as the 2022 Beijing Winter Olympics and Paralympics, the fifth China International Import Expo in Shanghai, and the World Internet Conference.

Established employee-oriented honorary system.

We took the initiative to enhance the sense of belonging, fulfilment, and happiness among our employees. Our people-oriented management philosophy places great emphasis on protecting the rights and interests of our employees, resolving their pressing issues and concerns, and allowing us to serve as an organization they can trust and rely on. We strive to create a fair, harmonious, healthy, and friendly work environment for our employees by implementing multiple measures to care for their physical and mental well-being. We have built a belief that “every employee is a valuable talent and has the potential to become even more valuable”. To this end, we have in place a rounded talent development program encompassing “Selection, Development, Deployment, and Retention”, and the program covers “Recruitment, Training, Management, and Deployment” for new employees. We have developed an honorary system to support employee growth and we provide employees with learning opportunities at our academy to enhance their theoretical knowledge, professional skills, and overall ability, helping them to continuously improve themselves.

This year we will fully, accurately, comprehensively implement the new development philosophy and build our new growth structure, with an aim to accelerate our transformation into a world-class enterprise. We will continue to deepen the “One Core and Two Wings” strategy. Our position as a “world-class information and communications infrastructure service provider, and a highly competitive information and new energy applications provider” will see us developing an operating system that is professional, intensive, delicate, efficient, and digitalized. We will use this to build an enterprise centered around sharing, service, innovation, technology, and value creation. In addition, we are committed to enhancing the Company’s environmental, social, and governance systems by setting detailed targets and implementing key tasks. We recognize the importance of fulfilling our social responsibility and enhancing our new momentum as we continue to grow. Our unwavering commitment to high-quality development will contribute to building a modern socialist country.



Zhang Zhiyong
Chairman of the Board

Statement of the Board

The Board of Directors of the Company has placed great emphasis on the ESG management and has established an ESG management system headed by the Board of Directors and led by the management, for cross-departmental and top-down collaboration. As the highest responsible and decision-making body for ESG matters, the Board of Directors of the Company is responsible for overseeing environmental, social and governance matters and holds at least one meeting a year to discuss management strategies of ESG and important matters.

The Company regularly evaluates the importance of environmental, social and governance concerns, and the specific evaluation process and results are detailed in the section headed “Stakeholder communication and substantive concerns analysis” of the annual ESG report and reviewed by the Board of Directors. The Audit Committee of the Board of Directors of the Company is responsible for overseeing the risk management and internal control system, including risks related to environmental, social and governance, as detailed in Corporate Governance Report of the Company’s Annual Report and reviewed by the Board of Directors on a regular basis.

During the Reporting Year, the Company has established environmental objectives associated with its business operations and conducted a review on the completion of the objectives set in the previous year, as detailed in the section headed “Firmly practicing green and low-carbon philosophy” of the annual ESG report and reviewed and discussed by the Board of Directors.

Detailed ESG-related matters are disclosed in this Report, which has been reviewed and approved by the Board of Directors on 2 March 2023.

◀◀ Walking into China Tower

China Tower Corporation Limited, a large state-owned enterprise that provides telecommunications infrastructure services, was founded with the support from the State Council, against the backdrop of implementing the Cyberpower strategy, and promoting the sharing of telecommunications infrastructure resources. The Company mainly engages in the construction, maintenance and operation of telecommunications towers and other ancillary facilities of base stations, public network coverage over high-speed railway tunnels and subways and large indoor DAS; the Company also leverages on its unique resources to provide the public with services featuring informatized applications and energy application services such as smart battery exchange and power backup, and serves as China's main force for the construction of wireless communications infrastructure and 5G infrastructure.

Incorporated on 15 July 2014 and headquartered in Beijing, the Company has established branches in 31 provinces and prefecture-level cities across China. After over eight years of operation, China Tower has developed into an international company with 2.055 million tower sites and assets of more than RMB300 billion, as well as the largest telecommunications infrastructure operator around the globe. On 8 August 2018, the Company was listed on the main board of the Hong Kong Stock Exchange (stock code: 0788.HK); in 2019, the Company was selected as one of the Fortune Global Future 50, enjoying a ranking of 22, and as one of the World's Top 100 Digital Companies, ranked 71st; from 2018 to 2020, the Company was titled "Listed Company with the Best Investment Value" by the China Securities Golden Bauhinia Awards for three consecutive years, and won the special award of "Listed Company with the Best Investment Value during the 14th Five-Year Plan Period" granted by the 11th China Securities Golden Bauhinia Awards, and won the "Listed Company with the Best ESG Practice" granted by the 12th China Securities Golden Bauhinia Awards.



Ranked **22**nd in
Fortune Global
Future 50



Ranked **71**st in
the World's Top 100
Digital Companies

Walking into China Tower

The Company practices the new development philosophy in all respects, gives full play to its core competitive advantages in low cost, high efficiency and quality services, and supports the development of such wireless communications infrastructure as 5G in an economical and efficient manner, to firmly prop up the construction of “Cyberpower” and “Digital China”. When devoting to building telecommunications infrastructure sharing and unified operations, the Company leverages on its unique resources to enlarge the sharing scope from intra-industry to the public. By establishing the wholly-owned subsidiaries, namely, Smart Tower Corporation Limited (鐵塔智聯技術有限公司) and Energy Tower Corporation Limited (鐵塔能源有限公司), the Company has formed a business layout featuring “One Core and Two Wings”, with TSP business as the core and the businesses operated by Smart Tower Corporation Limited and Energy Tower Corporation Limited as two wings. The Company is committed to becoming a world-class information and communications infrastructure service provider, as well as a service provider of informatized application and new energy application with core competitiveness. Smart Tower Corporation Limited tapped into its advantage in mid- and high-point resources characterized with numerous and wide-spread site coverage and high-point monitoring capacities to turn “telecommunication towers” to “digital towers”, and employed technologies including visual perception, data collection, image analysis, information processing, etc. to develop the product named Tower Monitoring which is serving over 40 industries such as environmental protection, meteorology, emergency response, public security and navigation. Energy Tower Corporation Limited relies on the power backup capacity of mature, distributed base stations and professional operation and maintenance teams to provide the communities with integrated new energy services such as battery exchange, charging, power backup, power security; it is the only pilot enterprise to recycle the retired electric vehicles’ batteries of new energy vehicles, which is specified in a document issued by seven ministries and committees including the Ministry of Industry and Information Technology, striving to become the main force for cascade use of retired electric vehicles’ batteries.

Awards and Honors 2022:



In March 2023, the project of “Innovation and Application of Low-carbon Energy Technology for Wireless Telecommunications Base Station” declared by the Company won the first prize of 2022 Science and Technology Award of China Institute of Communications.



In February 2023, the Company was awarded “The Asset ESG Titanium Award 2022” by The Asset.



In January 2023, the Company was awarded “ESG Hong Kong Stock Best Practice Award 2022 (Social)”, “ESG Hong Kong Stock Best Practice Award 2022 (Governance)”, “ESG Hong Kong Stock Industry Best Practice Award 2022 (Telecommunications Services)” by Wind.



In December 2022, the Company won the award of “Listed Enterprises of the Year” by Bloomberg Businessweek.

In December 2022, the Company won the “Listed Company with the Best ESG Practice” in the 2022 China Securities Golden Bauhinia Awards.



In November 2022, the Company’s Digital Construction of China Tower won the “Excellence Award of 2022 IDC China Future Enterprise Award”.



In September 2022, the Central Committee of the Communist Youth League and the Ministry of Human Resources and Social Security jointly issued the Decision on Awarding the 21st National Youth Job Competent Person. Ms. Wang Yi from Dalian Branch of China Tower was awarded the title of “21st National Youth Job Competent Person”.



In August 2022, the Company was listed in the Forbes 2022 China ESG 50.

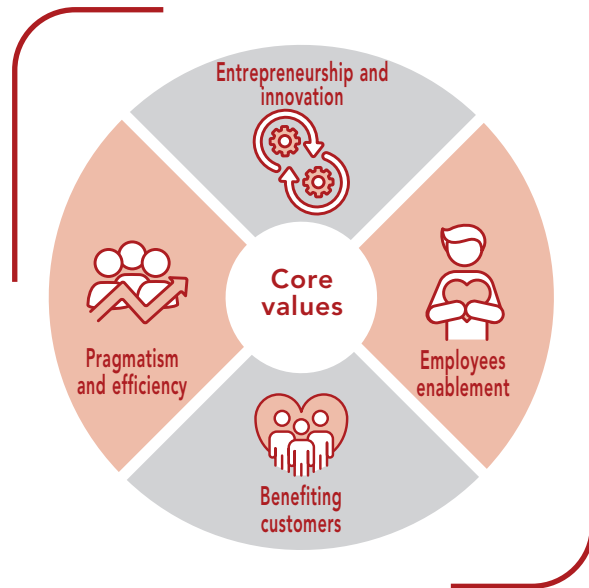


In January 2022, in the selection activity for enterprises with modernized and innovative management in the communication industry held by the China Association of Communication Enterprises, the Company’s “DevOps Digital Management Practice” honourably claimed the first achievement award, “Electronic Reconciliation of Electric Bill” honourably claimed the second achievement award and “Business Cooperation Platform and Digital Management of Supply Chain” honourably claimed the third achievement award.

Consolidating the Foundation of Sustainable Development

I. Environmental, social and governance philosophy

Adhering to the core values of “Entrepreneurship and innovation, pragmatism and efficiency, benefiting customers and employees enablement”, China Tower accelerated the enhancement of the new generation of information technology, new energy and other emerging industries in line with strategic plans made by the state of “Cyberpower”, “Digital China”, “5G infrastructure” and “dual carbon” to promote the healthy development of the sharing economy, the digital economy and the platform economy.



We effectively fulfill our environmental, social and governance responsibilities, incorporate the philosophy of sustainable development into corporate strategy and business operation and management, work hard to implement the United Nations’ Sustainable Development Goals (SDGs), and promote the construction of telecommunications infrastructure in China’s least developed regions, to significantly increase the penetration of communications networks and support network upgrades. The Company insists on taking resource sharing as our core, reduces redundant construction to save natural resources, works hard to reduce the impacts of the Company’s business operations on the environment, increases the use of renewable energy, and proactively promotes low-carbon and environment-friendly production methods. We are committed to supporting the healthy and sustainable development of the industry and enterprises and to jointly tackling the issues of climate change.





II. ESG governance structure










The Company has established an ESG management system headed by the Board of Directors and led by the management, for cross-departmental and top-down collaboration. The Board of Directors is responsible for the formulation of ESG strategies and goals, and the management takes charge of the practical implementation of such strategies and goals. Several departments in the headquarters work together as an ESG working group tasked with carrying out ESG operations within their fields of business, and each provincial branch performs local ESG tasks under the guidance of the ESG working group. The establishment of the ESG management system ensures that the environmental and social risks involved in various business lines are properly managed, and that the ESG philosophy and strategies are effectively implemented.

III. Stakeholder communication and substantive concerns analysis

With reference to the requirements of the Environmental, Social and Governance Reporting Guide of the Hong Kong Stock Exchange, the Company actively understood and responded to stakeholders' concerns on the ESG issues of the Company through questionnaires, reviews and summaries, and exchange meetings, identified and determined the importance of concerns of stakeholders, and took it as an important reference for the degree and boundary of issue disclosure. The key stakeholders that we have identified based on the characteristics of our business operations, their major ESG concerns, and the main communication channels are listed in the table below.



Consolidating the Foundation of Sustainable Development 


		
Main stakeholders	Key ESG issues	Main communications and responses
 Government and regulatory authorities	Legality and compliance Environmental protection Climate change	Meetings with government and regulatory authorities Disclosure of compliance reports Relevant conferences and forums
 Shareholders and investors	Legality and compliance Transparent governance Climate change	General meetings Annual reports and announcements Investor meetings
 Customers	Customer service Quality maintenance Customer complaints Privacy protection	Dedicated customer managers 10096 service hotline Customer complaint management mechanism WeChat service account Questionnaire
 Employees	Employee interests and benefits Remuneration system Labor standards Training and development Health and safety	Employee representative conferences Employee activities Employee training Performance review mechanism Employee appeal mechanism Questionnaire
 Communities	Rural vitalization Social welfare	Volunteer activities Rural vitalization activities
 Suppliers	Transparent procurement Equal competition Business ethics Win-win and mutual benefit	Procurement activities Supplier evaluation Supplier portals Supplier hotlines Questionnaire

 Consolidating the Foundation of Sustainable Development



The Company continued to communicate with various stakeholders to learn about their views and advice on issues related to the environment, social, governance and others. In light of its own strategy and business priorities, the Company performed materiality analysis on 12 aspects of ESG issues that were listed in the ESG Reporting Guide, and the analysis results are as follows:







The Company identified highly important topics, i.e. "B6-2 Product Responsibility – Customer Service", "B7 Anti-corruption", "B4 Labor Standards", "B6-3 Product Responsibility – Information Security", "B6-4 Product Responsibility – Product Innovation", "B2 Health and Safety", "B1 Employment" and "B3 Development and Training"; topics of moderate importance included "A2 Use of Resources", "B6-1 Product Responsibility – Brand and Intellectual Property", "B5 Supply Chain Management", "A3 The Environment and Natural Resources" and "A4 Climate Change"; relevant topics included "A1 Emissions" and "B8 Community Investment". The Company will elaborate on the above topics individually in respective chapter in this Report.

Consolidating the Foundation of Sustainable Development 


IV. Supporting the United Nations' sustainable development goals

 	<ul style="list-style-type: none"> • In 2022, the Company carried out poverty alleviation in 24 provinces and 98 counties (villages) across the country, and supported rural revitalization through various means such as contributing alleviation funds and purchasing and selling agricultural and sideline products. • In 2022, the Company continued to increase alleviation funds and actively purchased and sold various agricultural and sideline products for poverty-stricken areas in Baojing County, Hunan Province, Xuan'en County, Hubei Province and Hefeng County, Hubei Province.
	<ul style="list-style-type: none"> • The Company established a characteristic top-level planning and design for safety management – “0361” safety management system for tower captain system. The headquarters has signed the safety responsibility agreement with the provincial branches to carry out the identification and rectification of hidden dangers throughout the system to ensure safe production. • The Company strictly implemented various pandemic prevention measures to ensure the health of employees under the pandemic normalization. • The Company continues to standardize and strengthen the management of cooperative units and pays close attention to the construction of institutional mechanisms and the implementation of the responsibility system, to ensure the safety of lives and property of the personnel from the Company's cooperative units. • The Company established a comprehensive medical insurance system based on basic medical care and supported by supplementary medical insurance, critical illness insurance and personal accident insurance, covering employees and their family members.

 Consolidating the Foundation of Sustainable Development

	<ul style="list-style-type: none"> • The Company established a comprehensive and systematic training mechanism for all staff from fresh graduates to management personnel. • In 2022, the average training hours of the Company was 106.8 hours, increasing 60% as compared with that of 2021.
	<ul style="list-style-type: none"> • The Company guaranteed gender equality in recruitment, promotion, training and other stages. • The Company carried out activities such as caring for and consoling female employees, specially set up baby care rooms for female employees, and offered refrigerators, disinfection cabinets, sofas and other facilities. • In 2022, the percentage of female employees in the Company reached 27.2%.
	<ul style="list-style-type: none"> • The Company proactively promoted the full coverage of communications and the construction and application of video surveillance for water conservancy facilities. By the end of 2022, the Company has utilized sites to conduct monitoring and surveillance of more than 4,700 key rivers and lake areas, and more than 2,300 reservoirs, and solved the “four types of unlawful acts” in rivers and lakes waters and the occurrence of dangerous problems in reservoirs and dams.
	<ul style="list-style-type: none"> • The Company actively promoted the application of new energy base stations, accelerated the application of clean energy such as solar energy, deployed the base station energy storage system, built a new power system with “Power generation, Grid, Load and Storage”, and created an ecological network of green and smart energy. As of the end of 2022, the Company had 18,000 clean energy sites nationwide.

Consolidating the Foundation of Sustainable Development 

	<ul style="list-style-type: none"> • The Company continuously improved flexible and dynamic promotion mechanism, and encouraged multi-channel and all-round development of talents. • With post value as the basis, performance as the orientation, salary level in labor market as the reference and in combination with the economic benefits of enterprise, the Company established a remuneration incentive system in a reasonable manner, reflecting staff's work performance and substantive contribution and promoting them to make improvements through their remuneration. • The Company implemented the restricted share incentive scheme, covering the management and core technical talents who made positive contributions to the Company's overall performance and sustainable development.
	<ul style="list-style-type: none"> • The Company made an all-out effort to support constructing and developing 5G infrastructure. As of the end of 2022, an aggregate of over 3.6 million telecommunications tower construction projects had been completed, including 1.761 million 5G base station projects, which helped China build the world's largest mobile broadband network with the best quality.
	<ul style="list-style-type: none"> • The Company strengthened the construction of communication infrastructure in remote areas and poor villages and towns to effectively promote the construction of rural communication infrastructure. As of the end of 2022, it had undertaken 57,400 pilot projects of universal telecom services and 3,626 border sites to effectively eliminate the "Digital Divide".



Consolidating the Foundation of Sustainable Development






- The Company deployed **57,000** battery exchange sites nationwide, serving over **902,000** users, providing over **900** million times of accumulated battery exchange services, and driving electric vehicles for over **70** billion kilometers, which is equivalent to reducing carbon emissions by over **2.35** million tons.
- The Company utilized the high and medium altitude video surveillance and monitoring technology to serve the ecological and environmental conservation governance through scenarios such as the ban on straw burning, water source protection, black and odorous water, sea drifting garbage monitoring and carbon monitoring.



- In 2022, the TSP business achieved a rate of **99.9%** in terms of power outage and network exit duration standard in different cities and operators and **100%** compliance rate was achieved among **30** provinces except for Guangdong province.
- The Company implemented the client service representative and dedicated customer service agent systems and implemented routinized communication mechanism both among the leaders and employees to ensure prompt response to and resolution of client requests.
- The Smart Tower business of the Company continued to deepen the “companion services” and rooted in customer business processes to promptly respond to customers, and build multi-directional service operation capabilities and network security capabilities.

Consolidating the Foundation of Sustainable Development 

	<ul style="list-style-type: none"> • In response to the national strategy of “carbon peaking and carbon neutrality”, the Company contributed to the realization of the “dual carbon” goal through shared green development, technological innovation-driven development, and expansion of energy services, etc. • The Company regularly calculated and disclosed the data on emissions of greenhouse gases to evaluate the impact of our business activities on climate change.
	<ul style="list-style-type: none"> • The Company built nearly 5,000 video monitoring points and nearly 300 radar surveillance points on the shared telecommunication towers in Hubei, Hunan and other regions, covering key waters in more than 300 districts and counties in the Yangtze River Basin, which effectively improved the efficiency of fishery law enforcement in the Yangtze River Basin and reduced the occurrence of illegal activities such as fish theft, stealing and electrofishing.
	<ul style="list-style-type: none"> • The Company expanded the service capability of the tower surveillance platform by serving the information construction of 51 nature reserves and 37 wetland reserves in China in combination with more than ten types of wildlife monitoring equipment to support the protection of biological habitat.

 Consolidating the Foundation of Sustainable Development



- The Company continued to improve its internal supervisory mechanism and strengthen the disciplinary inspection-related petitions and reporting.
- The Company carried out a comprehensive investigation of operating an enterprise among all contract employees.
- The Company required that the Integrity Assurance Contract must be signed before entering into a business contract with a supplier and a partner.
- The Company strengthened the educational activities on business integrity to enhance the employees' awareness of integrity.



- The Company was dedicated to building a supplier management system to ensure win-win collaboration and orderly competition, strengthened the management of debt projects, optimized the supplier access scheme, and implemented the post-assessment of suppliers to jointly create a healthy and sustainable business development model.

Data Presentation of China Tower >>

Our power

The aggregate number of telecommunication towers construction projects: over **3.6** million, including the 5G base station projects: **1.761** million, tenancy ratio: **1.74**



The number of battery exchange outlets deployed under energy business: **57,000**, serving users: **902,000**



Total headcount: **21,906**



Transformation of "telecommunication towers" into "digital towers": over **200,000**



The number of industries served by Smart Tower: over **40**

Our responsibilities



Percentage of female employees: **27.2%**, representing an increase of **0.9** percentage point compared to that of 2021



Average training hours per employee: **106.8** hours, representing an increase of **60%** compared to that of 2021

Pilot projects of universal telecom services undertook: **57,400**, border sites: **3,626**

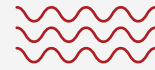
Support personnel for emergency relief and important activities throughout the year: **712,000**, vehicles: **358,400**, diesel engines: **598,000**, patrol inspections at the stations: **95,000**, power generation: **128,000**



163 youth volunteer organizations were registered and **962** volunteer service activities carried out throughout the year

Our value

The total number of towers spared from the building by the Company through co-development: **980,000**, resulting in a saving of land: **55,000** mu, and steel: **4.38** million tons, reduction of carbon emissions: **25.98** million tons



The number of key river and lake areas monitored by the Company through its sites: over **4,700**, and reservoirs: over **2,300**



The number of information construction projects serving nature reserves nationwide: **51**, wetland reserves: **37**

The aggregate number of times of battery exchange services under energy business: over **900** million, equivalent to a reduction in carbon emissions: over **2.35** million tons



Area of nationwide farmland monitored online in real-time by the Company: over **70** million mu



The total number of the Company's clean energy sites nationwide: **18,000**

The number of video monitoring points for straw burning on farmland: over **30,000**, area of farmland served: nearly **450** million mu



The number of general earthquake monitoring stations constructed by the Company using site resource: **10,349**



The number of forestry fire prevention and warning service points: over **50,000**

The number of tower video monitoring points for fishery ban on the Yangtze River: nearly **5,000**

Special Topics

Topic I Full implementation of the rural revitalization strategy

In 2022, China Tower adhered to the standards of “Making rural areas to equip with prosperous industries, livable ecology, civilized village style, effective governance and wealthy life (產業興旺、生態宜居、鄉風文明、治理有效、生活富裕)”, fully capitalized on the advantage of business, technology and resource, fully integrated into the development layout of the assisted areas, further fulfilled the mission of state-owned enterprise, contributed strength of state-owned enterprise, and demonstrated responsibility of state-owned enterprise in promoting overall revitalization of rural areas. The Company continued to increase the investment in assistance capital for three designated assistance counties (Baojing County in Hunan Province, Xuan'en County and Hefeng County in Hubei Province), proactively purchased and sold various agricultural and sideline products, organized training for county and rural primary-level cadres and rural revitalization leaders, etc., and was well appraised by the three designated assistance counties. Furthermore, the Company's branches at each level carried out assistance work in 24 provinces and 98 counties (villages) nationwide, and assisted rural revitalization through various means such as contributing assistance capital and purchasing and selling agricultural and sideline products.

(I) Scientific and technological revitalization

China Tower comprehensively implemented the national strategy of “new infrastructure construction” and technology and innovation development to perform inclusive services, continuously strengthened the construction of communication infrastructure in remote areas and poor villages and towns, vigorously promoted the construction of rural telecommunications infrastructure and helped various rural industries flourish. The Company took advantages of its resources of the extensive network of tower sites at high location to build an intelligent management platform, focusing on smart villages, safe villages and the construction of ecological villages. The platform was used for epidemic prevention and control, forest fire prevention, village management, disaster prevention and emergency response and other public affairs, to improve the level of rural digital construction and strengthen rural grassroots governance capabilities. In 2022, the Company undertook 5,210 pilot projects of universal telecom services and 505 border sites, providing a strong support of information and communications infrastructure for rural revitalization and helping rural areas across the country to fully open up an information highway and effectively eliminate the Digital Divide.



In 2022, the Company undertook
5,210 pilot projects of
universal telecom services.



505 border sites

Case: Construction of telecom universal service projects to help win the battle against poverty



▲ Universal telecommunications services project site: Longjing Village, Zhijin County (織金縣龍井村)

▲ Universal telecommunications services project site: Zengjiashai Group, Nayong County (納雍縣曾家寨組)

On the way of rural revitalization and development, the Company deeply promoted the telecom popularization services and helped construct harmony and beautiful villages which were suitable for living and working. In order to win the battle against poverty and help poor counties to get rid of poverty in Bijie, Guizhou, the Company actively organized operators and cooperative units to select sites for poor villages and groups for many times, including Longjing Village and Zengjiashai Group, and took initiative to improve communications network coverage. At the same time, based on local actual situation, the Company compared and analyzed a variety of construction schemes and adopted the optimum way, which achieved the full coverage of network signal in each village and group and provided stable network services for thousands of households. The Company vigorously practised the aim of universal services that “affordable for all and available everywhere”.

Case: Base station construction helping revitalize islands

The Company fully recognized that 5G network construction was significant for Zhoushan, a city consisting of islands in Zhejiang Province, to develop its marine economy and that 5G network will patently boost the islands’ achievement of common prosperity. Working with the government authorities and three telecoms operators, the Company promptly set up a special team for 5G construction under the islands’ common prosperity initiative named “Hola Islets (小島你好)”. The team examined the 5G signal coverage of the first 12 islands and their surrounding waterways and anchorages, and given that there was no fresh water, electricity or transmission on such uninhabited islands, the Company adopted the innovative technologies for 5G base station to construct the station sites on a case by case basis. For example, the 5G base station on the Shengsihua Reef in Zhoushan sent both 4G and 5G signals, which completely solved the problem of weak signal coverage for the nearby docks and shipping lanes and met the 5G communication needs of the crew and fishermen travelling in the surrounding waters, waterways and anchorages. This special project serves not only as China Tower’s practice under “Hola Islets (小島你好)”, Zhoushan’s common prosperity initiative, but also as a demonstration of China Tower’s commitment to helping revitalize the islands, which brings out the best in the islands.



▲ Uninhabited island base station in Zhoushan



▲ Shengsihua Reef base station in Zhoushan



Case: Construction of base station on the Butterfly Island to ensure full coverage of communications



▲ Aerial view of the new materials tower



▲ Solar panel and machine room

In Guangxi, the Company actively undertook the universal services projects on the Butterfly Island. The base station is located to the south of Qisha Peninsula, Fangchenggang city, Guangxi. Although it has abundant tourism resources, there are no communications and electric supply infrastructures on the island. The Company adopted innovative solutions to solve the difficulties in the construction of the Butterfly Island station. The 30-meter-high tower of the base station employed polyurethane fiberglass, with advantages of light weight and easy installation; the machine rooms used brick-concrete ventilation structure to ensure natural volatilization of methanol fuel; and the base station was powered by photohydrogen stored energy which mainly relied on hydrogen energy, supplemented by light energy. While achieving zero emission, it can save more than 8,000 kWh of electricity per annum, contributing to solve the communication difficulties on the island.

(II) Industry revitalization

Focusing on industrial development and promoting industrial prosperity is an effective means for the Company to promote rural revitalization. The Company has helped expand the industrial scale of gold tea, Chinese bee and farm chicken in Zhongxi Village, Baojing County, Hunan Province, improved the infrastructures of fungus cultivation in Mayangzhai Village, Xuan'en County, Hubei Province, and expanded the tea factories in Mawang Village, Hefeng County, Hubei Province. Meanwhile, the Company helped villages accelerate the development of characteristic industry and carried out "Chain Extension Project" around local advantageous industries, representing extension from single production link to the whole industrial chain economy integrating production, packaging and sales to improve the added values of products to increase farmer's income. For example, relying on rural supply and marketing cooperatives, the Company helped create the whole industrial chain economy of production, supply and marketing integrating the supply of agricultural materials, planting of agricultural products, production and packaging and sales of products such as tea and honey in Mawang Village, Hefeng County, Hubei Province. The Company helped improve the whole industrial chain of toadstool breeding, planting, processing and sales in Mayangzhai Village, Xuan'en County, Hubei Province, and achieved an obvious effect of increasing the income of local farmers.

Case: Opening up channels for the production, supply and marketing of agriculture products to improve the development of local agriculture

To effectively solve the pain points and difficult problems for farmers in production, sales and supply practically, the Company innovated the ideas of assistance and cooperated with the Supply and Marketing Cooperative of Enshi Prefecture in Hubei Province and the Bureau of Forestry of Enshi Prefecture to build the “Mawang Village Supply and Marketing Cooperative” in Hefeng, Hubei Province. Based on the fundamental purpose of “serving agriculture, being engaged in agriculture and agriculture-based”, the Company enabled supply and marketing cooperatives to become a link connecting the village collective, farmers and merchants, and a bridge running through the supply of agricultural materials, agricultural production and sales of agricultural products by the organization structure of “village collectives + farmers + merchants”. Opening less than 4 months since the end of July 2022, the “Mawang Village Supply and Marketing Cooperative” achieved the sales revenue of RMB480,000; 15 villagers joined the cooperative and provided 25 jobs, and its services covered 3 villages and benefited more than 2,600 villagers. The project not only provides a reliable guarantee for the production, acquisition, processing, storage and sales of agricultural and sideline products in Mawang Village and its surrounding areas, but also promotes the diversified division of labor and industry for villagers, and realizes the outward radiation and extension of agricultural and sideline products, and opens up the “last 100 meters” of serving “agriculture, rural areas and farmers”.



▲ The “Mawang Village Supply and Marketing Cooperative” of Enshi in Hubei Province

Special Topics 

Case: Building the whole industry chain of morchella (羊肚菌) to accelerate the pace of industrial development

Focusing on the local industrial development plan, the Company accelerated the development of morchella industry in Mayangzhai Village (麻陽寨村), Xuan'en, Hubei Province, focusing on helping to improve the hardware facilities, built a morchella breeding center of 3,300 square meter, 40 mushroom and vegetable greenhouses and equipped with workshops for drying and packing, so as to build a modern ecological agriculture demonstration site. Meanwhile, the Company actively helped to attract investment, introduce the operating entities of the whole industry chain, build the operation mode of "Market entity + Village collective economy + Grower", continuously expand the industrial scale, thus realizing a whole industry chain economic system of morchella integrating breeding, planting, drying, packaging and sales. This initiative is expected to create more than 300 seasonal work opportunities for farmers each year, so that the average revenue growth of each grower could achieve RMB20,000 and the collective income of Mayangzhai village will increase by more than RMB100,000.



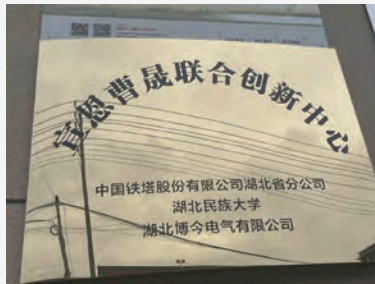
▲ Morchella Breeding Center and Packaging Workshops



The average revenue growth of each grower could achieve **RMB20,000**



Case: Supporting leading enterprises to intensify industrial revitalization efforts



▲ Hubei Xuan'en Industry Assistance Achievements Display

The Company fully leveraged its technological advantages to support Hubei Bojin Electric Co. Ltd. (湖北博今电气有限公司), the local leading enterprise in Xuan'en, Hubei Province, and jointly set up "Dr. Cao Sheng Workstation (曹晟博士工作站)" to jointly complete the technical achievements such as "Research and Application of Key Technologies of 5G Intelligent Electrical Equipment".

(III) Consumption revitalization

Consumption assistance (消费帮扶) is an effective way for the Company to promote rural revitalization and help farmers out of poverty and get rich. The Company innovated the idea of alleviation and assistance, and promoted the driving power of consumption through the construction of sales channels, striving to increase farmers' income, and promote their life prosperity. The Company guided merchants to establish Internet thought, focused on building dual online and offline marketing channels, introduced 12 high-quality enterprises from three counties, i.e., Baojing (保靖), Hunan Province, Xuan'en (宣恩), Hubei Province, and Hefeng (鹤峰), Hubei Province, into the "Central Enterprise Consumption Assistance (央企消费帮扶)" e-commerce platform, and built China Tower Assistance Product Pavilion (中国铁塔帮扶产品馆), which has driven nearly RMB7 million of commodity sales. In addition, the Company carried out internal "New Year's Day and Spring Festival to Send Blessings (元旦春节送祝福)", "May Day and Dragon Boat Festival to Send Cool (五一端午送清凉)", "Farmer's Harvest Festival to Send Harvest (农民丰收节送收穫)", "Mid-Autumn Festival and National Day to Send Warmth (中秋十一送温暖)" and other theme consumption assistance activities, further expanding the effectiveness of consumption assistance.



Special Topics **(IV) Talent revitalization**

People are key to rural revitalization. The Company actively participated in the cultivation of rural revitalization talents and strengthened the construction of rural social work workforce. While focusing on the cultivation of high-quality rural talents, the Company carried out various forms of activities such as selecting typical, praising advanced, supporting farmers and helping farmers, vigorously carried forward the traditional virtues of helping others, filial piety and affection for the relatives, diligence and frugality, and continued to promote the cultural construction of civilized village style, good family style and honest folk style. For example, in Zhongxi Village (中溪村), Baojing, Hunan Province, the Company organized the award party of “Beautiful Zhongxi·Harmonious Zhongxi·Filial Piety and Good Deeds” to reward the constructors of beautiful villages, leaders of industrial prosperity and practitioners of filial piety and good deeds. In Mawang Village (麻旺村), Hefeng, Hubei Province, the Company selected and commended the most beautiful families, the most beautiful Mawang people and the most beautiful entrepreneurs and so on through the village-level art show and commendation conference. In Mayangzhai Village, Xuan'en, Hubei Province, the Company organized the selection of projects such as “Civilized Family (文明家庭)” and “Beautiful Garden (美丽庭院)”.

Case: Comprehensively building the talent team and strengthening the cultivation of rural talents

The Company continued to strengthen the building of talent team, paid close attention to the needs of assistance, and coordinated closely with government authorities. The Company provided training for grass-roots cadres, leaders in getting rich, practical technical talents, specialized households and farmers through special training, village night study, field drills and other ways. In 2022, the Company assisted in organizing training for 3,669 rural talents of all types, including 1,789 rural grass-roots cadres, 503 rural revitalization leaders, and 1,377 professional and technical talents, further strengthening the talent support for rural revitalization.



▲ Rural high-quality talent training project site



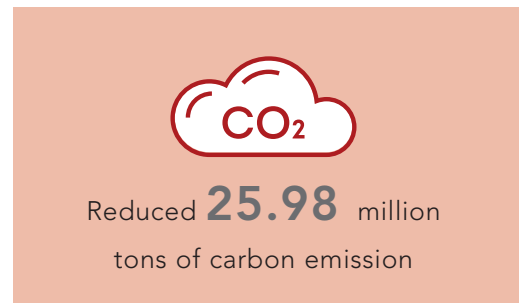
The Company trained **3,669**
rural talents of all types.

Topic II Empowering green and low-carbon development multi-dimensionally

China Tower actively implemented the national strategy of “dual carbon”, deeply implemented the Company’s green development ideas, continued to deepen the co-construction and sharing of communication infrastructure, boosted energy conservation and emission reduction in network facilities, promoted the green transformation of the energy structure of communication base stations, actively explored intelligent operation and maintenance, and comprehensively improved the Company’s green and low-carbon development level.

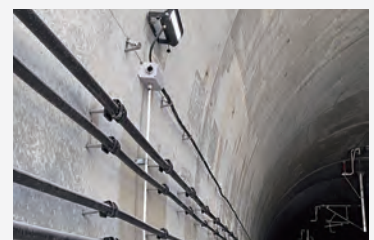
(I) Resource sharing and green energy consumption

By deepening coordination and resources sharing, the Company constructed in a more intensive and efficient way. The Company adhered to the principle of “prioritizing co-location and building up new sites based on our sharing philosophy” to effectively reduced the industry redundant investment construction and resources waste. As of the end of 2022, with co-construction and sharing, the Company managed to cut out a total number of 980,000 newly built towers, saved 55,000 mu of land and 4.38 million tons of steel, reduced 25.98 million tons of carbon emission and saved RMB176.0 billion in investment.



Case: Improving the sharing rate of the towers and vigorously promoting resource saving

The total length of Chongqing Section of Zhengzhou-Wanzhou High Speed Railway is 183.86 kilometers, including 28 tunnels with a length of 169.7 kilometers, accounting for 92.3% of the total length, which is difficult to construct and has high technical requirements. The Company targeted at the establishment of the high-quality information network, adhered to the principle of co-construction and sharing and gave full play to its coordinating role to integrate all kinds of railway transmission pipeline, power introduction, tunnel walls and cabinets and other resources. The Company has completed the laying of leaky cables of about 700 kilometers of the entire tunnels and has built 87 telecommunication towers along high-speed railway and 355 communication base stations in the tunnel in only 130 days, while the three TSPs share 100% of the communication infrastructure, which effectively realized resource saving.



▲ The joint-construction of base stations and leaky cables in the tunnel of Zhengzhou-Wanzhou High Speed Railway

Special Topics 

Under the guidance of the national policy of promoting clean and low-carbon energy transformation, in order to promote the application of new energy technologies and services, and improve the green energy consumption level of base stations, the Company took into full account the distribution of renewable resources in different regions, actively promoted the application of new energy base stations, accelerated the application of clean energy such as solar energy, deployed the base station energy storage system, built a new power system with "Power generation source, Grid, Load and Storage" capabilities, and created an ecological network of green and smart energy. As of the end of 2022, the Company had 18,000 clean energy sites nationwide.

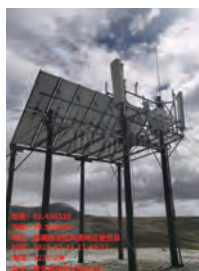
In Tibet, Xinjiang, Inner Mongolia and other regions where the city grids were not accessible and unstable, the Company used photovoltaic power supply as a safeguard power supply, and at the same time, conducted pilot projects of photovoltaic complementary systems in Shandong, Jiangsu, Zhejiang and other provinces. When photovoltaic power generation is sufficient, solar photovoltaic power supply is directly applied to the base station shelters as clean energy, and redundant power is stored by energy storage batteries. When photovoltaic power generation is insufficient, it is powered by batteries or city grids to maximize the use of solar energy resources and reduce carbon emissions. At the same time, the Company actively promoted the market-oriented trading of base station electricity and green electricity trading. Shandong Tower became one of the first 26 market entities to participate in the declaration of green electricity trading in Shandong Province, and purchased a total of 4.8 million kWh of green electricity.



The Company had
18,000
clean energy sites nationwide.



Purchased a total of
4.8 million kWh
of green electricity.



▲ Solar photovoltaic power supply for base station

Case: Construction of base station integrating solar energy, diesel, wind and storage, innovative application of clean energy



▲ The base station integrating solar energy, diesel, wind and storage in Putuo Mountain

On the Zhuzishan uninhabited island in Putuo Mountain, the Company adopted the innovative solution of integrating solar energy, diesel, wind and storage to solve the power supply supporting construction of the base station, and newly built facilities such as diesel engine room, civil engineering foundation, solar power generation system, fixed diesel engine power generation system, integrated energy cabinet, MIMO intelligent power dispatching cabinet, etc., supplied power to the base station in the order of solar power generation, battery power supply and diesel engine power supply. The innovative integrated design of solar energy, diesel, wind and storage ensured the power supply of the base station while minimizing the consumption of fossil energy and giving priority to the use of local wind and solar energy, thus greatly promoting the green and clean transformation of the energy consumption structure of the base station.

Case: Communication base station integrating solar energy and storage with direct power generation to support the green construction of 5G

In Zhejiang, the Company has started the construction of green base stations to make use of photovoltaic power generation and battery storage, and built a distributed intelligent energy mode based on base stations through the mode of self-generation and self-consumption, thus improved the ability of power supply guarantee for stable operation of base station, reduced the consumption of public electric energy, which is in line with the Company’s basic route of green energy saving, and achieves cost reduction and efficiency improvement for the industry and customers, as well as helps the industry to better implement the “dual carbon” strategy.



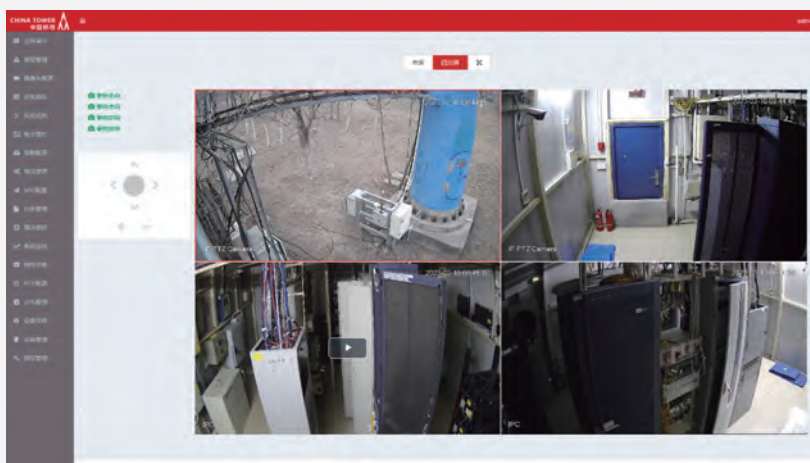
▲ The energy storage equipment in the station and photovoltaic equipment on the top of the station

Special Topics **(II) Energy saving and consumption reduction with technological innovation**

The company vigorously carries out technological innovation, adheres to the development concept of specialization, digitalization and intelligence, constantly expands the technical boundary of intelligent operation and maintenance, promotes the refined management of air conditioning energy consumption at base stations, innovatively applies energy-saving power supply equipment and new energy base station construction methods, and is committed to continuously make breakthroughs in energy saving and consumption reduction in all production and operation links, and reduce greenhouse gas emissions.

Case: Promoting operation and maintenance intelligence level and saving manual operation costs

By adopting the terminal-edge-cloud technology of "terminal video capture + edge AI computing + cloud AI computing", the Company realized the whole process connection of business functions including intelligent inspection, intelligent station access and intelligent capital management through the effective collaboration of cameras, edge gateways and system platforms, and explored and expanded the functions of power generation audit, safety disclosure, emergency communication support, remote fault handling support and remote on-job acceptance. In addition, the Company strengthened the leading role of production and coordination in the provincial network operation center, improved the intensification of production monitoring and coordination, changed the production operation models such as manual inspection, manual cooperation operation on station access and manual verification of resources and assets among commissioned partners, improved the efficiency of maintenance production operations and management, and reduced energy consumption in the operation and maintenance process.



▲ Real-time video surveillance for Single Station



**Terminal-edge-cloud
technology**

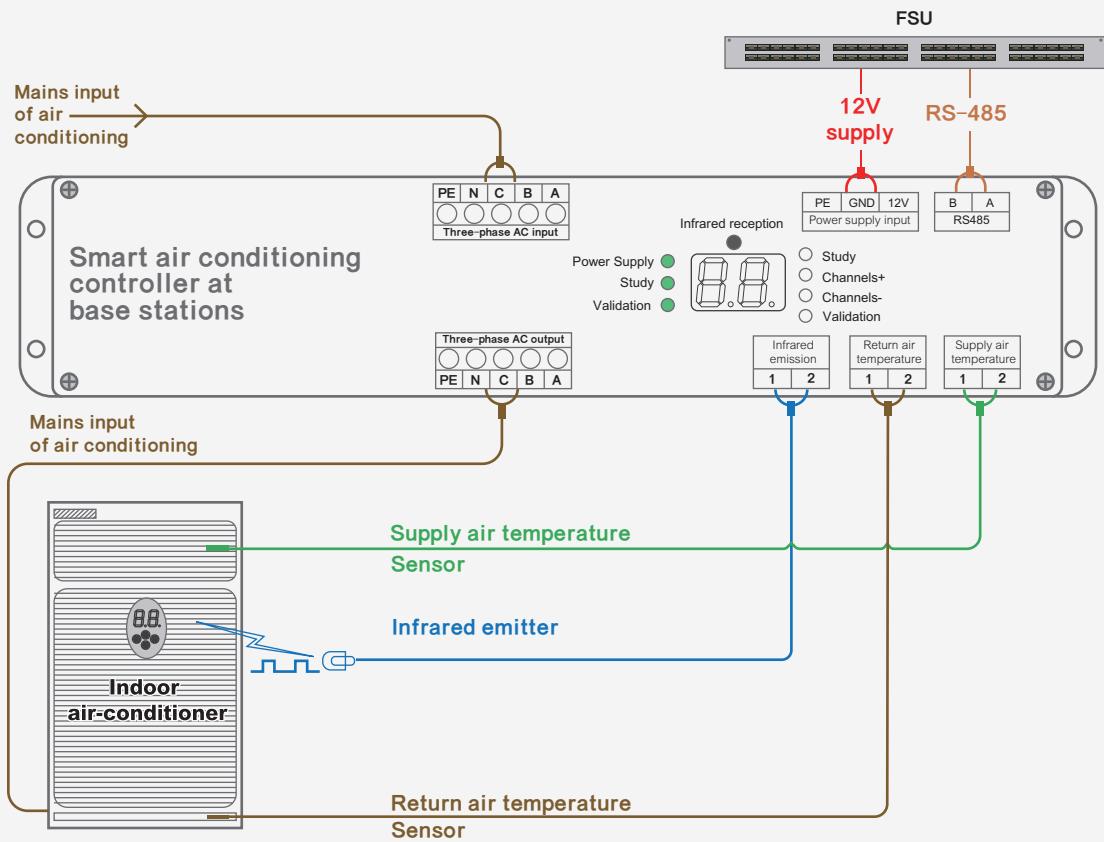
Terminal video
capture
+
Edge AI computing
+
Cloud AI computing

Case: Energy saving and emission reduction in network facilities to improve the energy efficiency of communication base stations

The Company actively promoted the refined management of energy consumption of air conditioners at base stations, and invested a total of RMB380 million to carry out intelligent transformation of 725,000 wall-mounted and cabinet air conditioners in the network, and developed AI energy-saving algorithm by itself. By implementing refined management and control on energy consumption of air conditioners, each air conditioner can save 2.43 kWh per day during its operation, reaching an energy-saving rate of 26.2% and saving approximately 268 million kWh per year.



Energy saved by each air conditioner was **2.43** kWh per day during its operation, energy-saving rate of an air conditioner reached **26.2%**.



▲ Smart air conditioning controller at base stations

Special Topics 

Case: Application of new outdoor power supply to reduce power resources consumption



▲ Application of new outdoor power supply in Shanghai

In Shanghai, according to the actual situation, the Company replaced supporting facilities such as outdoor integrated cabinets and air conditioners with new outdoor power supplies in the construction of the new tower sites, and installed a total of more than 500 new outdoor power supplies throughout the year, which can save 609.12 square meters of land resources and was expected to save 1,482,200 kWh of electricity consumption, thereby effectively reducing the use of land resources and power resources.

Case: Innovating and reforming the construction methods of solar power base stations to reduce electricity consumption

In Tibet, the Company's base stations were located in remote places that most of the city grid failed to reach. In order to speed up the construction efficiency of communications base stations, reduce engineering costs and solve the difficulties in electricity introduction, transportation and construction of mobile base stations in plateau areas, the Company optimized the construction method of traditional solar energy, effectively reduced the transportation difficulties for cement poles and the maintenance risks for maintenance personnel. While effectively guaranteeing the power supply of base stations, each station can save 1,350 kWh of electricity per year comparing with the introduction of city grid.



▲ Construction of solar base stations in Tibet

(III) China Tower battery exchange for green travel

The Company actively implements the "dual carbon" strategy, adheres to path of green development, and forward-looking layout of energy business. The Company extended our capabilities of providing power backup based on telecommunications base station to society, providing diversified smart energy services such as battery exchange and backup power to achieve resource sharing, empowering society and serving people's livelihood.



The battery exchange network covers over **280** cities in **31** provinces

The Company has deployed a battery exchange network across China and has become the nation's largest battery exchange operator for light electric vehicle. The battery exchange network covers over 280 cities in 31 provinces, deploying 57,000 battery exchange sites, and serving over 902,000 users; provided 2.00 million times of battery exchange services for users every day, and the accumulated battery exchange services exceeded 900 million times, driving electric vehicles for over 70.0 billion kilometers, which is equivalent to reducing carbon emissions by over 2.35 million tons.

Special Topics



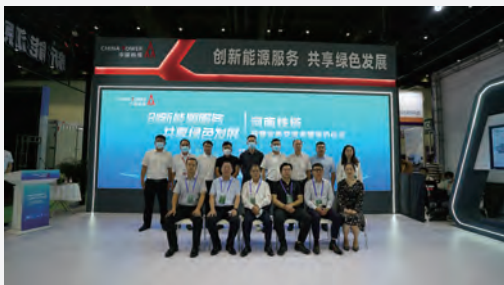
Case: Laying out new battery exchange business, responding to national policy and serving people's livelihood

In Anhui Province, the Company actively responds to national policies and relies on its own advantages to build a new type of smart green energy infrastructure which has a smart battery exchange network covers 16 prefecture-level cities in the whole province, deploys 2,600 battery exchange cabinets and puts in 90,000 sets of battery exchange, providing 7×24 hours professional service guarantee for 60,000 users in the whole province. Since the launch of the battery exchange business in 2019, the working mode of takeaway riders and couriers who use lead-acid batteries or fuel as power has been changed. The Company's accumulated battery exchange services have exceeded 45 million times, and the accumulated mileage has exceeded 3.7 billion kilometers, which is equivalent to reducing carbon emissions by over 120,000 tons.



▲ The couriers use battery exchange service of China Tower

Case: Strategic cooperation to help the energy transformation of the logistics and express industry



▲ New energy business signing ceremony for the logistics and express industry

In Henan Province, the Company successfully held the smart energy business exchange meeting with the theme of "Innovate Energy Services to Share Green Development" in September 2022, and signed strategic cooperation agreements with a number of express companies, new energy logistics vehicle companies and new energy facility providers on the spot. We strived to fully support the high-quality development of hundreds of thousands of industries in Henan on the track of new energy, provide new energy solutions to the industries through join hands of eco-industry, and fully assist them to achieve green and low-carbon transformation and upgrading.

Topic III **Developing a picturesque ecosystem by digitalization and intelligence**

"Harmonious coexistence between human and nature" is the strategic task of the ecological civilization construction of China in the New Era. While promoting the construction of 5G networks, the Company is diligently promoting the transformation from "telecommunication towers" to "digital towers", promoting communication base station facilities to become an important part of computing infrastructure, strengthening the foundation of and empowering the development of smart interconnection and digital intelligence, and become the strong force for supporting the environmental protection in China, and endeavor to protect our blue skies, clear waters and clean lands.



"Harmonious coexistence between human and nature"

is the strategic task of the ecological civilization construction of China in the New Era.

(I) Constructing smart water conservancy to protect water ecology



The Company proactively promoted the full coverage of communications and the construction and application of video surveillance for water conservancy facilities, and facilitate the modernization of water conservancy governance systems and governance capacity. By the end of 2022, the Company has utilized over 10,000 sites along rivers, lakes and reservoirs to conduct monitoring and surveillance of more than 4,700 key rivers and lakes areas, and more than 2,300 reservoirs, and solved the "four types of unlawful acts" in rivers and lakes waters and the occurrence of dangerous problems in reservoirs and dams. It also provided repair and maintenance of hydrological observation equipment, sharing of underlying resources and facilities and other service for 57 hydrological observation points in 9 provinces nationwide, providing real-time forecast, projection and early warning and serving smart water conservancy construction.



Case: Digital watershed construction project, supporting digitalization and intelligence of river and lake management

In Chuzhou, Anhui Province, the Company fully utilized high-point mount of towers along the lake and power resources of the computer rooms in Minghu Lake, to build a three-dimensional all-factor monitoring system that integrated the "space, sky, ground and human" to realize information control for the whole watershed. The digital baseboard and twin system of the Minghu Lake watershed would be completed upon completion of the project, which could conduct intelligent simulation for water conservancy governance and management activities, and provide simulation and emulation function for digital twin watersheds, which effectively contributed to the construction of felicitic rivers and lakes, and realized the digitalization, refinement and intelligence of river and lake management.

Case: Constructing water monitoring system to protect the ecological environment of Dianchi Lake



▲ Dianchi Lake and wetland monitoring system

The Company shared the use of 13 towers with a height of over 35 meters around Dianchi Lake, and installed high-precision dual-spectral monitoring equipment and AI algorithm, to realize all-weather visual monitoring of Dianchi Lake without dead corners, which could promptly detect ecological and environmental problems such as green algae flooding and sewage discharge in the waters of Dianchi, monitoring a water area of 330 square kilometers. The system improved the law enforcement monitoring experience and command efficiency, enhanced the management capability of illegal sewage discharge in the lake area, and promoted the ecological protection of Dianchi Lake.

(II) Monitoring forest fire prevention to guard lucid waters and lush mountains



The Company contacted with the national nature reserve, state-owned and local forest farms, national parks and other areas regarding site



By the end of 2022, the Company shared and utilized more than **50,000** towers and computer rooms construction monitoring points around the forest areas.

planning. By the end of 2022, the Company shared and utilized more than 50,000 towers and computer rooms construction monitoring points around the forest areas, providing forest and grass fire prevention early warning services for 270 prefecture-level cities in 31 provinces. In addition, the Company extended the service capacity of the tower monitoring platform, combined with more than ten types of wildlife monitoring equipment to serve the informatization construction of 51 nature reserves and 37 wetland reserves nationwide.

Case: Forest intelligence monitoring to prevent fire hazards

In Huanggang, Hubei Province, the Company planned to share more than 695 sites, first phase of construction involved 94 command centers, 434 video monitoring points and 542 intelligent cloud broadcast, and built forest front-end perception, high-point video communication and intelligent early warning platform for forest fire prevention.



▲ Huanggang forest fire prevention and early warning command system

Therefore, a complete system of forest fire prevention, fire-fighting and protection had been formed, which greatly improved the local forest fire prevention and early warning level. The Company provided the basic guarantees for the modernization of forest fire prevention and control, regularization of management work, professionalization of team building, standardization of fire-fighting equipment as well as scientification of fire-fighting work.



Case: Smart forestry service project to protect the ecological system in an all-round way

In order to protect the precious ecosystem resources in Xishuangbanna, the Company built 398 video monitoring points and 23 sets of business system platforms in the forest area of Xishuangbanna, forming a comprehensive management and service platform for forest resources data, and integrating forest land management, forest rights management, biodiversity, Asian elephant dynamic supervision, forest fire prevention, old and valuable trees, forester management, pest control and other functions. Since the operation of the project, a total of 9,347 effective alerts had been triggered, and the city's forest rangers inspected more than 61,000 times through the patrol APP, with a patrol distance of more than 923,000 kilometers, and reported 44,370 patrol events. The implementation of the project greatly improved the comprehensive management capacity of local forestry authorities for the ecological environment in the forest region and the effectiveness of forestry post-disaster early warning. Therefore, the illegal use of fire in the wild, such as burning leaves and straws, burning garbage, etc., were stopped in time, finally achieving 0 fire throughout the year in 2022.

(III) Deploying the monitoring system for fishery ban and assisting in ecological restoration

In the past two years since the implementation of the comprehensive fishery ban in the Yangtze River, the Company built nearly 5,000 video monitoring points and nearly 300 radar surveillance points on the shared telecommunication towers in Hubei, Hunan and other regions, covering key waters in more than 300 districts and counties in the Yangtze River Basin, which effectively improved the efficiency of fishery law enforcement in the Yangtze River Basin, deterred offenders, and reduced the occurrence of illegal activities such as fish theft, stealing and electrofishing.

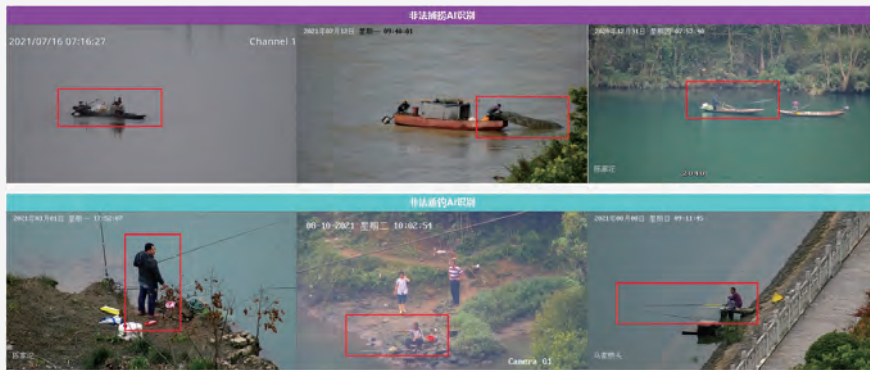


Built nearly **5,000** video monitoring points and nearly **300** radar surveillance points in more than **300** districts and counties in the Yangtze River Basin.



Case: Serving the ten-year fishery ban, protecting the clear water of the Yangtze River valley

In Hunan Province, the Company shared existing telecommunication towers and built 1,351 video monitoring points and 102 radar surveillance points for ministries of agricultural and rural affairs at all levels in the main stream of the Yangtze River, the Xiangjiang River, Zijiang River, Yuanjiang River, Lishui River systems, and along the Dongting Lake, covering key waters relating to fishery ban in 73 districts and counties, thus making important contributions to the implementation of the fishery ban in the Yangtze River and the stability of the Yangtze River ecosystem.



▲ Identification of illegal fishing and illegal angling on fishery law enforcement supervision platform of Tower Monitoring





Case: Real-time monitoring and supervision to protect aquatic organisms

In Jingzhou, Hubei Province, the fishery ban waters of the Yangtze River include 483 kilometers of the main stream of the Yangtze River, 93 kilometers of the ancient course of Yangtze River and 22 aquatic life protection areas. The Company takes advantage of the mid and high-point site resources, stable power supply and convenient transmission and communication conditions of the communication tower along the river, and mounts high-definition cameras and radars on the communication tower, relying on the Company's Internet of Vision platform of Tower to integrate the AI intelligent algorithm, to monitor and supervise illegal fishing and angling, which has better solved the problems of insufficient law enforcement personnel, difficulty in finding and obtaining evidence for illegal acts, and imperfect supporting procedures, providing strong support for the "ten-year fishery ban" of the Yangtze River.



▲ Tower high-definition camera real-time monitoring screen

(IV) Monitoring with high-level towers to serve prevention and control of pollution

The Company gives full play to the advantages of tower monitoring operation and tower site resources; using the mid- and high-point video surveillance and providing services for ecological and environmental conservation governance around scenarios such as the ban on straw burning, water source protection, black and odorous water, sea drifting garbage monitoring and carbon monitoring; providing strong support for modern ecological environment monitoring system construction, winning the tough battle against prevention and control of pollution, constructing a protective barrier for ecological environment and ecological civilization construction.



Modern

ecological environment
monitoring system construction

Case: Supervising straw burning activities, making contribution to prevention and control of air pollution

In 2022, the Company has carried out real-time supervision of straw burning on nearly 0.45 billion mu of farmland nationwide through more than 30,000 video monitoring points in 24 provinces across the country. In Hainan, the Company uses tower high site point, through visible light + thermal imaging camera infrared monitoring + fireworks AI intelligent analysis 24-hour uninterrupted monitoring to achieve all-weather, seamless supervision of key areas. By the end of 2022, straw burning prohibition high-definition intelligent high altitude video surveillance had covered 26,209.94 square kilometres of farmland and 3,367.95 square kilometres of key areas in the province, sensing and alarming the fireworks points for straw burning and betel nut roasting a total number of 29,293, with a disposal rate of nearly 90%, and the number of daily alarms gradually decreasing from over 1,000 in the early stage to current average of less than 10, and environmental conservation governance has achieved notable successes. In addition, the system is also superimposed on the two violations of land, construction site dust monitoring, monitoring stealing trees and river sand, fishery ban during the fishing moratorium and other intelligent algorithms, providing all-round and multi-angle service for ecological environmental protection and prevention and control of pollution, and making contribution to protecting clear water and blue skies.



The Company has carried out real-time supervision of straw burning on nearly **0.45 billion** mu of farmland nationwide through more than **30,000** video monitoring points in **24** provinces across the country.



▲ Hainan straw burning prohibition supervision project



Case: Centralized supervision of drinking water sources, protecting a corner of clear water

In Jiangxi, the Company relies on towers around water source region to build the high-altitude video surveillance systems and high-point video surveillance around reservoirs to weave a full-coverage video surveillance network for water source region, and through video + AI algorithms to realize real-time supervision and intelligent warning of phenomena such as flotsam, illegal intrusion of boats, illegal construction, illegal fishing, and rubbish dumping. In 2022, in Shangrao, Jiangxi, the Company used video surveillance network to effectively monitor the Da'ao Reservoir with a catchment area of 390 square kilometres and reservoir capacity of 275.7 million cubic metres, which meets the water demand of 1 million people. The Company is fully committed to protecting safety and hygiene of the drinking water sources.



▲ Aerial view of the high-altitude video surveillance of Jiangxi Da'ao Reservoir



(V) Intelligent and integrated governance to build a beautiful countryside



The Company relies on internet of vision platform to integrate AI algorithms, combining with satellite remote sensing technology, the sensor technology of Internet of Things, to achieve the digitalization and intellectualization for governance means of straw incineration ban in the countryside, forest fires prevention, river and reservoir monitoring, soil pollution regulation, safe emergency response, encroachment on farmland supervision, rubbish dumping regulation and other scenarios, improving the comprehensive digital governance for rural areas.



Improving the comprehensive **digital** governance for rural areas



Special Topics 

Case: Sharing digital towers and building digital countryside

In Liushanhu town, Xianning, Hubei, the Company shared telecommunications tower within an area of 32 square kilometres and mounted 12 high-definition cameras, to achieve intelligent supervision of straw incineration ban in all regions, forest fires prevention, rubbish dumping, illegal occupation of farmland and rural residence land, etc. as well as live broadcast of rural scenery with local characteristics and folk customs. In addition, the Company mounted 20 cloud broadcasts to publicize agricultural information, policies and regulations, as well as warn of extreme weather and evacuate, and integrate data of remote sensing monitoring, land ownership, three land investigations and geological disasters within the township area to realize various functions such as crop growth trend analysis, crop harvest evaluation, crop pest monitoring and geological disaster risk warning, providing town governments with a regular, visualized and intelligent comprehensive governance plan to protect the beautiful rural ecological environment.

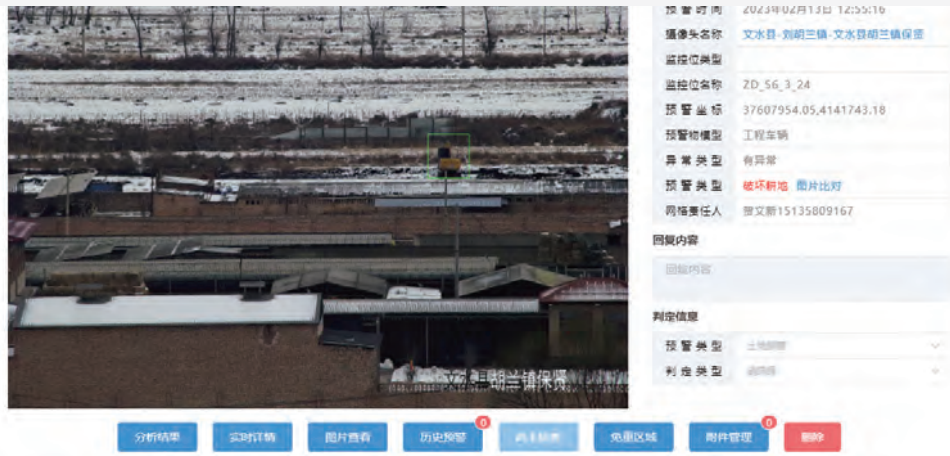


▲ Digital village platform of Liushanhu town



Case: The smart supervision project to protect natural resources

In Lvliang, Shanxi Province, the Company utilizes 726 tower sites to build high-point monitoring points, realizing real-time video monitoring of key areas such as districts, counties, towns, densely populated areas, natural resources concentration areas and cultural scenic spots in Lvliang City, so as to improve the efficiency of handling offences such as destruction of farmland, illegal utilization of land and illegal mining.



▲ Real-time video monitoring in Lvliang





An aerial photograph of terraced tea fields, showing a series of curved, wavy rows of green tea plants on a hillside. The fields are densely packed and follow the contours of the land, creating a rhythmic, undulating pattern. The color is a vibrant green, with some darker patches of soil or stone visible between the rows. The overall scene is lush and scenic, typical of a tea plantation in a mountainous region.

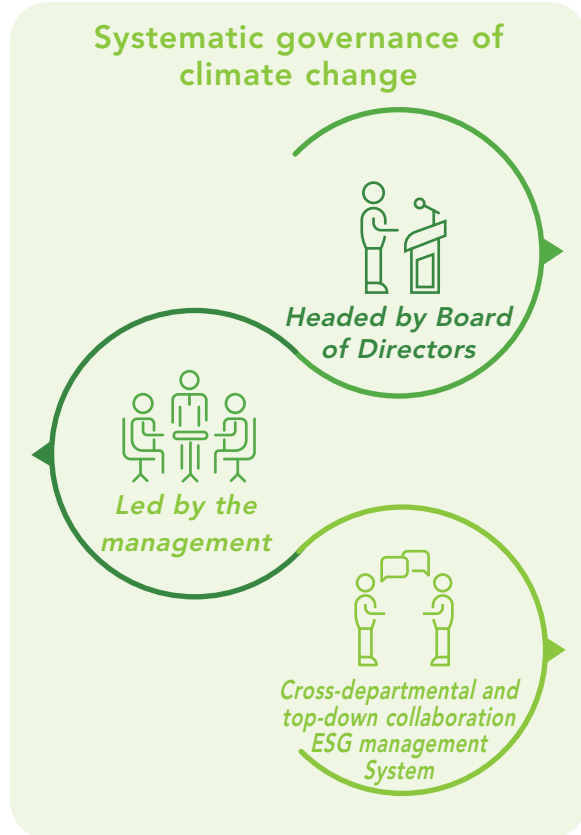
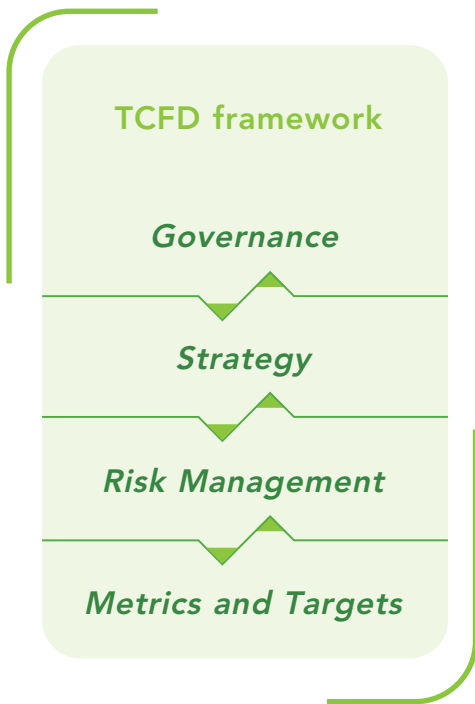
Environment

- 50 I. Firmly practicing green and low-carbon philosophy
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Environment >>

I. Firmly practicing green and low-carbon philosophy

In addition to changing and affecting the global ecosystem and natural environment, climate change also has a profound impact on social and economic development and enterprise development. China Tower is committed to minimizing the impact of its businesses on the environment and climate change through more systematic governance, more comprehensive strategies, better risk management and clearer objectives. In 2022, according to the disclosure framework recommended by TCFD, the Company carried out relevant work and disclosed climate-related information from four perspectives: "Governance", "Strategy", "Risk Management" and "Metrics and Targets".



(I) Governance




The Company has established an ESG management system headed by the Board of Directors and led by the management, for cross-departmental and top-down collaboration to improve climate change management comprehensively. The Board of Directors is responsible for the formulation of climate change strategies and goals, and the management is responsible for the practical implementation of such strategies and goals. Several departments in the headquarters work together as an ESG working group tasked with carrying out specific climate change risk management and response operations within their respective fields of business. Meanwhile, the Company has set up a leading group of carbon peaking and carbon



neutrality for China Tower to deepen the implementation of the Company’s green development concepts, and promote the implementation of climate change related tasks. Each provincial branch performs local climate change related tasks under the guidance of the ESG working group and the leading group of carbon peaking and carbon neutrality. The establishment of the above management system ensures that the climate change risks involved in various business are properly managed, and that the climate change concepts and strategies are effectively implemented.

(II) Strategy

The Company actively implemented the national strategy of “dual carbon”, deepened the implementation of the Company’s green development concepts, focused on shared green development, technological innovation driver, and new energy application services, etc., comprehensively improved the Company’s green and low-carbon development level.

 <p>Adhered to shared green development</p> <p>By coordinating resources, intensive construction, deepening sharing, optimizing energy structure, promoting the green transformation of the energy consumption structure of communication base stations, and promoting the cascade utilization of batteries, the reduction in carbon emission got support in an effective manner.</p>	 <p>Strengthened the technological and innovation</p> <p>Carrying out technology and product innovation in the fields of towers, DAS, and energy, etc., the Company saved resource consumption from the source, actively explored intelligent operation and maintenance and improved deployment efficiency.</p>	 <p>Expanded new energy application services</p> <p>The Company focused on new energy mobility services, accelerated the battery exchanging and charging infrastructure layout in an economic and efficient manner, strived to build a livelihood project, and led the public to green travel and safe charging. It specialized in power backup services, promoting the “Power Backup + Power Generation + Monitoring + Maintenance” four-in-one solution to improve the level of urban emergency power security. The Company actively explored integrated energy services, implementing the national strategy of “dual carbon”.</p>
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Environment

(III) Risk management

The Company has established an analysis and assessment mechanism for climate change risks and opportunities, analyzing the possible impact on the Company's business development due to the risks and opportunities related to climate change, and formulated targeted countermeasures in conjunction with the identification and assessment results.

In 2022, the Company fully identified the risks and opportunities of climate change from the perspectives of strategy, market, finance, operation, technology, law and policy, and actively took countermeasures.



Types of Risks and Opportunities	Risk and Opportunity Description	Countermeasures
Acute risk	Extreme weather may damage infrastructure such as tower sites, battery cabinets and computer rooms, resulting in loss of fixed assets and pollution of the surrounding environment.	The infrastructure is designed to be weather-resistant during the design phase. According to the frequency and scale of natural disasters in that year, timely assess their impact on asset loss and pollution of the environment.
	Extreme weather may lead to disruption in construction, longer construction period and increased investment.	In the early stage of the project, fully consider the local climate factors, and include the cost of work delay resulting from extreme weather in the investment accounting during the construction cost stage.
	Extreme weather may damage the health and safety of construction and operation personnel.	Develop emergency plans for extreme weather in the construction plan and operation and maintenance program documents, and provide staff with complete labor protection measures.



Types of Risks and Opportunities	Risk and Opportunity Description	Countermeasures
Chronic risk	<p>Global warming will lead to an increase in the energy consumption of air conditioning and an increase in the Company's operating costs.</p>	<p>Regularly evaluate and monitor the use time and energy consumption of air conditioners at sites, computer rooms, and offices, adjust regulations on air conditioning use in a timely manner, and evaluate the financial impact of increased energy consumption costs.</p>
Transition risk	<p>In terms of science and technology, with the development of 5G technology, the communication infrastructure will be more densely distributed and energy consumption will increase, and enterprises will face greater challenges in the research and development of low-carbon technologies.</p> <p>In terms of laws and regulations, relevant agencies will have higher requirements for energy consumption and environmental protection during the construction and operation.</p> <p>In terms of the market, with the promotion of 5G technology, the scale of mobile networks has surged, resulting in an increase in the demand for tower construction, which may have an impact on the Company's overall energy consumption and greenhouse gas emissions.</p>	<p>Eliminate energy-intensive facilities in a timely manner. Cooperate with value chain partners to research how to improve energy efficiency of equipment and hardware to save energy and reduce carbon emissions.</p> <p>Strictly abide by the procedural requirements of environmental impact assessment, energy conservation assessment, water resource assessment in the preliminary stage of the project, and continuously improve the enterprise's environmental and energy management system.</p> <p>Regularly formulate and improve energy consumption plans to control the impact of the surge in infrastructure scale on the Company's overall energy consumption and greenhouse gas emissions.</p>

Environment 

Types of Risks and Opportunities	Risk and Opportunity Description	Countermeasures
Product/service opportunities	<p>With the increasing consumption of resources, the market has a more noticeable inclination towards the shared service model and the intelligent operation model.</p>	<p>The tower co-construction and sharing mode effectively enhances the efficiency of resource utilization, and intelligent operation and maintenance methods effectively reduce operating costs.</p> <p>The Company deploys battery exchange networks across China, which generates considerable carbon reduction benefits.</p>
	<p>With the strengthening of the greenhouse effect and the rise in energy costs, the market has a stronger preference for reuse, low energy consumption, new energy and other types of products.</p>	<p>The cascade utilization of waste batteries reduces the cost of power backup and waste emissions, which helps achieve efficient deployment of 5G base stations with low energy consumption.</p> <p>Research and use more energy solutions like the cascade utilization of batteries, to enhance the available life cycle of the batteries and have batteries feature economic, environmental and social benefits.</p> <p>Research and develop various methods of renewable energy site, use the natural conditions of the location of the sites (such as solar and wind energy) to supply power to the sites so as to reduce power consumption from the grid and reduce greenhouse gas emissions.</p>



(IV) Metrics and targets

While deploying and implementing the work of “dual carbon”, the Company has formulated a series of environmental targets related to climate change based on its own business situation, including energy and resource conservation and greenhouse gas emission reduction targets, and evaluates the progress of the targets every year.



Formulated a series of **environmental targets related to climate change**

Category	Targets for 2022	Targets achieved	Targets for 2023
Energy conservation	In 2022, the automatic energy-saving management and control rate of air conditioners in the Company’s base stations will reach 80%.	In 2022, the automatic energy-saving management and control rate of air conditioners in the Company’s base stations reached 81.69%.	In 2023, the automatic energy-saving management and control rate of air conditioners in the Company’s base stations will reach 85%.
	Based on 2021, by the end of 2022, the power consumption per capita of the Tower Industrial Park will be reduced by 3%.	By the end of 2022, the power consumption per capita of the Tower Industrial Park was reduced by 5.48% year-on-year.	Based on 2022, by the end of 2023, the energy consumption per capita of 31 provinces in China will be reduced by 2%; Based on 2022, by the end of 2023, the power consumption per capita of 31 provinces in China will be reduced by 2%; Based on 2022, by the end of 2023, the power consumption per capita of the Tower Industrial Park will be reduced by 3%.

Environment 

Category	Targets for 2022	Targets achieved	Targets for 2023
Other resource conservation and greenhouse gas emissions reduction	<p>The Company planned to continue to promote the joint-construction model in 2022 to achieve the following resource saving targets:</p> <ul style="list-style-type: none"> • 260,000 tons of steel used in towers • 2.08 million tons of concrete • 3.84 million A of switching power • Equivalent to a reduction of 1.41 million tons of greenhouse gas emissions 	<p>By the end of 2022, the Company saved the industry from building 63,000 new base stations through joint construction and shared access, and achieved the following resource savings:</p> <ul style="list-style-type: none"> • 299,000 tons of steel used in towers • 2.39 million tons of concrete • 6.9 million A of switching power • Equivalent to a reduction of 1.673 million tons of carbon dioxide emissions 	<p>In 2023, the Company planned to save the industry from building 60,000 new base stations through co-development and shared benefits to achieve the following resource saving targets:</p> <ul style="list-style-type: none"> • 273,000 tons of steel used in towers • 2.18 million tons of concrete • 6.55 million A of switching power • Equivalent to a reduction of 1.532 million tons of carbon dioxide emissions

II. Vigorously advocating energy saving and environmental protection

In addition to deepening resource sharing, restructuring energy, driving energy conservation through innovation, and expanding energy services in the business sector, China Tower continued to promote the cascade utilization of batteries, strengthened materials recycling, and implemented green transformation in the field of office and procurement to maximize the Company's green development potential and fulfill the responsibility of green development.



(I) Deepening the recycling of resources

In order to effectively promote the implementation of the national strategy of “dual carbon”, the Company substituted cascade batteries for original lead-acid batteries, leading to a great reduce of emissions from waste batteries; it also gradually improved the cascade battery industrial chain by virtue of the demand for large-scale application of base stations, actively participated in the construction of the whole life cycle industrial chain of cascade batteries and established cooperation mechanisms with upstream and downstream enterprises separately to maximize the use of products and recycling value. At present, the Company has developed a business model of large-scale application driven by standardized cascade battery products, which will not only help the Company strengthen the cascade utilization of batteries and deepen the recycling of resources, but also enable the Company to better safeguard the network operation of telecommunications enterprises and promote the healthy and sustainable development of the Company while fully fulfilling its social responsibilities.

On the basis of the construction of standardized cascade battery products, the Company developed cascade battery products for special scenarios, including scenarios for electricity utilization of base stations in low temperature, high-altitude, mountainous areas, and fields far away from residential areas and difficult to transmit electricity. Different cascade batteries backup systems were adopted to resolve the problem of unstable power supply of base stations in areas with poor power grid infrastructure. In addition, the Company developed standardized products under special working conditions and established enterprise-level technical specifications, which filled in the gap of application of cascade batteries under special working conditions and further deepened the cascade recycling of battery resources.

As of the end of 2022, the Company has used an aggregate of 510,000 sets of cascade batteries in approximately 250,000 telecommunication base stations in 31 provinces nationwide, totaling 3GWh.



Case: Promotion of cascade batteries in high altitude and cold regions to meet the demand for low-temperature power backup

In order to resolve the problem of service disruption in the base stations in high altitude and cold areas, the Company has carried out cascade battery promotion in Shigatse, Tibet since 2020, exploring the experience of using low-cost batteries in ultra-low temperature scenarios at high altitudes. The base stations in Shigatse, Tibet are mainly pure solar power stations and solar + mains supply power stations. With external ambient temperatures of around -25°C , the base stations have poor-quality power supply and serious low temperature problems. The Company has accumulatively used 598 sets of 150AH cascade lithium iron phosphate batteries in combination with flexible film heating and graphene heating, having addressed the battery needs of 137 sites. All batteries are in good working conditions and the service disruption of base stations has been greatly improved, fully meeting the demand for new energy and large capacity power backup of special sites in high altitude and cold regions.

Case: Development of cascade battery products for small scenarios to resolve the problem of multi-scenario power consumption

In order to resolve the difficulties in power access in some areas, the Company developed cascade battery products for small scenarios in Guangxi. Constrained by the terrain, the Company used a large number of radio remote units (hereinafter referred to as "RRU remote stations") in Guangxi to meet the demand for signal coverage. However, due to its narrow coverage and limited investment, no backup power supply was deployed for remote stations in the early stage. In addition, as the flood season of Guangxi is long and power outages occurred frequently, while the remote stations were basically built in the high mountains and cannot generate electricity after power outage, there were frequent service disruptions in the base stations after power outage, which seriously affected the normal life of local residents. Since 2020, the Company has undertaken the enduring charging guarantee services of mobile RRU remote stations by adopting cascade batteries and integrated intelligent communications & power backup cabinets for power backup to monitor data feedback and ensure the smooth operation of power backup equipment and cascade batteries, which effectively resolved the problem of application of cascade batteries in the scenarios of frequent power outages and difficult maintenance.



▲ Integrated intelligent communications & power backup cabinet



In order to strengthen the recycling of dismantled materials, the Company has initially established relevant work processes to accelerate the development of circular economy. In practical application, the Company firstly identifies the dismantled materials, and after they are identified to be qualified, information of the materials will be simultaneously entered into the project management system, which is convenient for subsequent new projects to know the situation of the dismantled materials in time and to use them based on needs. As of the end of 2022, the Company has completed the identification of more than 15,000 dismantled materials for recycling, and has used more than 4,000 dismantled materials, accounting for more than 25%.



The Company has completed the identification of more than **15,000** dismantled materials for recycling, and has used more than **4,000** dismantled materials, accounting for more than **25%**.

Case: Reuse of idle assets to support energy saving and environmental protection operations

In Yantai City, Shandong Province, the Company actively promoted the utilization of idle assets through the idle asset processing process, and continuously improved the level of green and low-carbon development. The Company has saved investments of more than RMB3 million in total this year, combined economic and environmental benefits, and effectively turned dismantled materials into resources and exchanges stock for increments.



Saved investments of more than RMB **3 million** in total this year.



▲ Recycling site of dismantled materials

Environment

(II) Reinforcing the concept of green office



The Company strictly abided by the Law of the People's Republic of China on Energy Conservation (《中華人民共和國節約能源法》), the Water Law of the People's Republic of China (《中華人民共和國水法》) and other relevant laws and regulations, issued the "Notice on Building a Conservation-oriented Enterprise and Carrying out the 'Five Ones' Activities of Diligence and Thrift" (《關於建設節約型企業，開展勤儉節約「五個一」活動的通知》), continued to improve the internal green office management system, and carried out a number of environmental protection measures, such as energy saving, water saving, waste management and paperless office, in all office areas with the goals of building a smart, green and safe park.

In 2022, the Company had no material problems in sourcing water that was fit for purpose.

Carried out a number of environmental protection measures in all office areas with the goals of building a **smart, green** and **safe** park.

In addition, the Company promoted the concept and knowledge of energy saving and emission reduction among employees through various ways, systematically promoted energy saving and consumption reduction. The Company helped construct a green office environment and fulfilled the concept of green and sustained development of the Company.

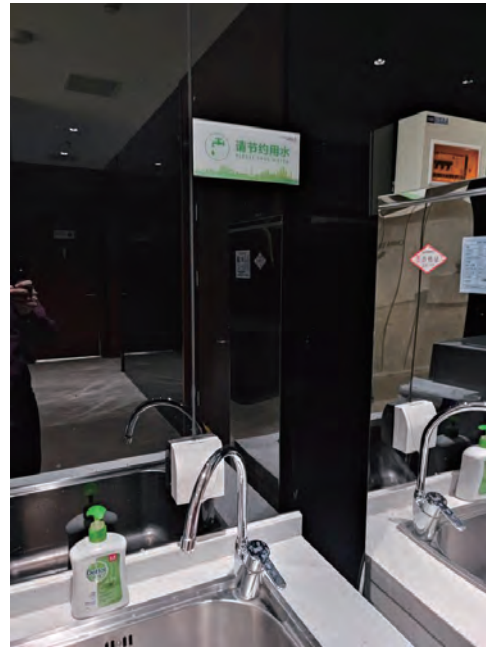
Green office initiatives

In order to improve employees' awareness of electricity saving, the Company has posted energy saving and emission reduction signs in all major office areas and large-scale electrical equipment, and strengthened the supervision of employees' electricity consumption in daily work, so as to require employees to actively respond to and cooperate with a number of energy-saving measures formulated by the Company. For example, the Company requires employees to "Turn off lights and computers immediately when you leave (人走燈滅、人走機關)", and turn off the power of lamps, air conditioners, water dispensers and office equipment (such as computers, printers) in time after getting off work. The Company requires employees to set the temperature of the air conditioner reasonably, do not turn on the air conditioner in the areas where the temperature is suitable, set the temperature of the air conditioner to not lower than 26°C in summer, not higher than 24°C in winter, and close the doors and windows when the air conditioner is turned on.



▲ Post energy saving signs and advocate green office

In order to avoid wasting of water resources, the Company strengthens the daily maintenance and management of water equipment, regularly overhauls faucets, etc., and eliminates the phenomenon of “running water”. In addition, the internal rules and regulations formulated by the Company also clarified specific measures to save water resources, including: remind employees to control the flow of water from valves and faucets; turn off in time when dripping water is found, report of repairs in time when the leakage is found, and prevents leakage and dripping. It is advocated to wash tableware, rags and mops, etc. without excessive water, reuse water, and effectively reduce water consumption. In the meantime, the Company strives to improve employees’ awareness of water saving, posts water saving signs at water equipment, and advocates employees to jointly fulfill the green concept of saving water resources.



▲ Post water saving signs at water switch

Paperless office is also an important part of the Company’s green office concept. In terms of paperless promotion, the Company advocates employees to make full use of electronic equipment, such as computers, projectors and LCD televisions to reduce paper consumption. In terms of advocating the concept of saving paper, the Company has posted signs of “Please save paper” in various paper scenes in the workplace, calling on employees to take practical actions to save paper resources.



The Company has posted signs of **“Please save paper”** in various paper scenes in the workplace, calling on employees to take practical actions to save paper resources.



▲ Paper-saving signs

Environment

Green management of the park

Based on actively publicizing the concept of energy conservation, the Company was committed to improving the overall power consumption efficiency of the park and decreasing waste of energy. In view of the actuality of the low utilization rate of the parking lot in the park during non-working hours, the Company replaced all lighting fixtures with radar sensor energy-saving lamps, which were dark light with low energy consumption when no one passed by, and switched to the normal lighting mode when someone passed by, so as to reasonably reduce power consumption while fully satisfying lighting needs. In 2022, the Company saved more than RMB63,000 in electricity costs for parking lot lighting during the year. The above measure has effectively strengthened the Company's efforts in energy-saving and consumption reduction, fully reflecting the Company's firm determination to save electricity and reduce energy consumption.

In terms of sewage discharge management, the Company invites nationally certified professional environmental assessment agency to test the sewage discharge in the park, check various indicators, analyze the causes and put forward relevant advice and opinions. According to the inspection results, the Company cleaned and treated the sewage pipelines in the park, strived to meet the national standards, fully guaranteed the safety and effectiveness of sewage treatment, and fulfilled the corporate responsibility of environmental protection.



▲ Radar sensor energy-saving lamp in the parking lot of the park



▲ Normalization of sewage discharge and purification treatment





In addition, the Company actively promoted the digital transformation of park services and management, and built a paperless office environment. In 2022, the Company launched the construction project for park service management system according to the on-site conditions and demands of the headquarters park. In mid-November, the Company's new service system was fully launched, and system improvement and module upgrades were gradually carried out. Through the new system, the Company can accurately and timely obtain the administrative service demands of various departments and employees, effectively optimize the office paper process, and thus achieve the goal of a paperless office.

In 2022, while implementing the "dual carbon" work and deploying energy consumption and greenhouse gas emission targets, the Company set environmental targets for water resource conservation and waste disposal in light of its own green office work, and evaluated the progress of the targets every year.

The Company actively promoted the **digital transformation of park services and management**, and **built a paperless** office environment.



▲ Park Service Management System



Environment 

Scope	Targets for 2022	Targets achieved	Targets for 2023
Water resource conservation	Based on 2021, by the end of 2022, the water consumption per capita of the Tower Industrial Park will be reduced by 3%.	By the end of 2022, the water consumption per capita of the Tower Industrial Park was reduced by 16.76% year-on-year.	Based on 2022, by the end of 2023, the Company's water consumption per capita in 31 provinces nationwide will be reduced by 2%; Based on 2022, by the end of 2023, the water consumption per capita of the Tower Industrial Park will be reduced by 3%.
Waste emissions	In 2022, the Company plans to transfer 100% of the sorted and stored waste in a separate manner in the industrial park within 24 hours.	In 2022, the sorted and stored waste in the Tower Industrial Park had been transferred 100% within 24 hours.	In the future, the Company will continue to ensure 100% disposal of hazardous waste in compliance with regulations, and the Tower Industrial Park will continue to adhere to the classification and storage of garbage to ensure transfer 100% within 24 hours.





(III) Implementation of green procurement

In order to implement the strategy of green operation and sustainable development, the Company actively implemented the work of green procurement, further promoted a paperless electronic procurement platform, comprehensively monitored carbon emissions of major products, actively paid attention to environmental risks in the supply chain, and continued to increase the intensity of green procurement.

The new outdoor power supply supporting equipment purchased by the Company included outdoor power supplies and outdoor batteries, which adopted natural heat dissipation and didn't need cabinets (boxes), air conditioning temperature control and other facilities required by traditional power supply supporting equipment. The overall conversion efficiency of the system was high, and at the same time, it adapted to the customer's C-RAN site construction strategy in a more green and environment-friendly way, which was in line with the national green, low-carbon, energy-saving and emission-reducing development concepts. This year, the Company had cumulatively purchased a total of 12,000 sets of new outdoor power supply equipment across the country, including about 7,000 sets of outdoor power supplies and about 5,000 sets of outdoor batteries.

During this year, the Company continued to promote paperless procurement. Based on the original paperless operation of publishing announcement, offering procurement documents, bidding response, remote bid opening, and document clarification, the Company further achieved electronic review by optimizing the function of electronic bidding platform, which saved a total use of paper approximately 342,780.

The Company actively cooperated with suppliers this year and took the initiative to monitor the carbon emissions of tower building materials, battery equipment and other procurement projects throughout their life cycle, providing a statistical basis for the implementation of green procurement and the achievement of carbon reduction targets.



Environment

III. Jointly constructing a green and beautiful ecology

China Tower is committed to implementing the national green development principles and policies, establishes the concept of environment-friendly construction ecology in the process of construction, continuously accelerates the transformation of green development, and assists in the optimization of social energy structure and green and low-carbon development.

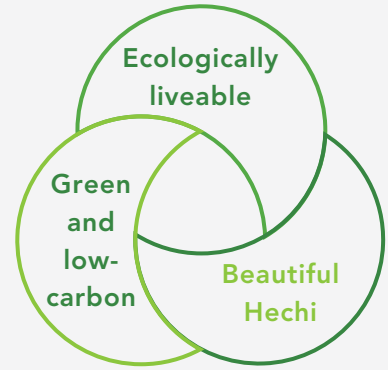
In terms of site selection, the Company actively adopted measures such as the use of clean energy at sites, tower co-construction and sharing, asset recycling, the cascade utilization of batteries, and intelligent operation and maintenance to maximize energy savings and protect surrounding environmental facilities. When building the new station site, the Company combined local municipal planning, key project planning, environmental protection requirements, coordinated and communicated with relevant departments such as municipal planning, and met the site location, height and other control planning requirements and other municipal environmental management requirements by relevant units.

In terms of construction, the Company paid great attention to the impact of the construction of towers and computer rooms on the environment, and strived to achieve a harmonious integration of construction and ecological environment through the plan upgrade and technology advancement; in accordance with the relevant national and industry standards, the Company made full efforts to prevent and control pollution in the process of construction, reduced the impact on the external environment and contributed to the construction of a Beautiful China.



Case: "Planting" tree with beauty, creating a harmonious ecological environment

In Hechi, Guangxi Province, in response to the call of Hechi Municipal Government, the Company comprehensively established "A beautiful Hechi city with livable ecology, green and low-carbon". The Company fully performed the ecological protection of the construction of telecommunications base stations, and built a number of new bionic tree telecom towers for scenic areas and key environmental protection zones, so that telecommunication infrastructure such as 5G towers could be better integrated into the surrounding environment.



▲ Bionic tree base station in Bama Changshou Village coexists harmoniously with the surrounding environment







Society

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Society >>

I. Sharing and striving for a digital and smart future

China Tower has always fully, accurately and comprehensively implemented the new development philosophy, deeply implemented the innovation-driven development strategy, and constantly deepened resource sharing. By supporting the 5G infrastructure, building digital towers, and deepening the sharing of energy applications, the Company is taking practical actions to empower a wide range of industries, assist in the achievement of the "dual carbon" goal in China, and contribute its Tower Power to the construction of Cyberpower, Digital China and Beautiful China.

(I) Supporting 5G infrastructure by intensive sharing

Information and communication infrastructure is the foundation for the development of 5G industry. Since its inception, the Company has taken on the mission of "deepening the joint construction and sharing of information and communication infrastructure to push forward the implementation of the strategies of Cyberpower and Digital China". As the "national team" for the construction of information and communication infrastructure and the main force for 5G infrastructure, the Company has actively played the role of strategic support for the state-owned economy, always practiced the new development philosophy, adhered to shared development, and fully supported the development of 5G construction.



Tenancy ratio

1.70 ▶ 1.74
2021 2022

"Deepening the joint construction and sharing of communication infrastructure to push forward the implementation of the strategies of Cyberpower and Digital China"



5G infrastructure construction

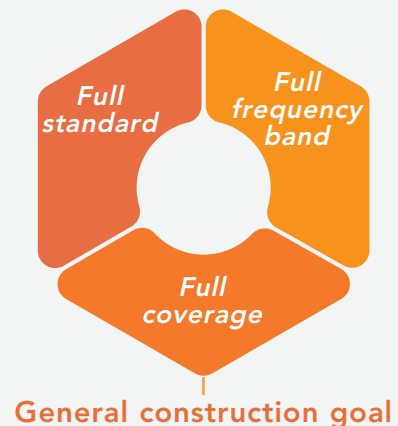
Leveraging advantages in resource coordination, the Company adopted intensive construction, deepened sharing, worked with telecommunications enterprises to create a high-quality 5G network, and improved the co-location rate of newly-built towers, to enhance the economic and efficient deployment of China’s 5G networks. The Company continued to innovate its construction model and meet network construction needs at low cost and high efficiency during the ongoing improvement of site co-location. As of the end of 2022, the Company accumulatively completed over 3.6 million telecommunication tower construction projects and undertook an aggregate of 1.761 million 5G base station projects, with the tenancy ratio increasing from 1.70 in late 2021 to 1.74, which helped China quickly build the world’s largest mobile broadband network with the best quality and achieve a leading position in the world in terms of 5G.

Case: Securing network communication for the Asian Games and strengthening sharing to save resources

In order to meet the comprehensive communication coverage requirements of the 19th Asian Games, the Company set the general construction goal of “full standard, full frequency band, and full coverage” to build a comprehensive coverage plan. The Company has completed the indoor DAS covering an area of over 5.30 million square meters, more than 560 tower base stations, with the site location sharing rate reaching 98%, the construction land reducing by 4.64 mu, the annual electricity consumption saving by 2.79 million kWh, thus saved investments of more than RMB12 million for the telecom industry. Based on the communication requirements of event, the Company innovatively adopted shaped antennas with multi-frequency, multi-mode and ultra-narrow beam, addressed the challenges of ultra-high capacity and ultra-diversified business during the Asian Games with ultra-dense networking solutions, explored the limitation of network performance in high-capacity and strong interfering scenarios, and ensured the synchronous sharing of information resource inside and outside the stadiums, which had provided advanced experience for the high-density scenarios of the same kind. Construction plan for this 5G event venues can fully meet the needs of intensive personnel and centralized data telephone traffic in the venues during the event. The audience can experience the athletes’ training and competition in an all-round and immersive way through various terminals such as mobile phones and VR glasses.



▲ Main Venue of Hangzhou Asian Games



Society 

Case: Creating a new infrastructure that perfectly integrates 5G and high-speed rail in construction of Hangzhou West Railway Station

Hangzhou West Railway Station is an important node project of the “Yangtze River Delta on Rails” and an important transportation supporting project for the Hangzhou Asian Games. In the implementation of the construction plan, the design of the 5G communication network of the Hangzhou West Railway Station fully combines the design characteristics of the “station-city integration” of the Hangzhou West Railway Station, and perfectly integrates the high-speed, ultra-reliability, and low-latency characteristics of the 5G network with the Hangzhou West Railway Station, and for the first time, antenna equipment is integrated into the station platform, which greatly improves the coverage effect as compared with that of Hangzhou East Railway Station serviced by the original operator.



▲ Hangzhou West Railway Station 5G communication network design



Perfectly integrated the **high-speed, ultra-reliability** and **low-latency characteristics** of the 5G network with the Hangzhou West Railway Station.



Case: Coordinating and upgrading the subway network to achieve shared and efficient 5G coverage

The Hangzhou-Huzhou Railway (湖杭鐵路) is an important transportation guarantee project for the Hangzhou Asian Games. In the construction of the public network coverage project of the Hangzhou-Huzhou Railway, the Company has always prioritized co-location and stuck to sharing philosophy in building up new site. The TSPs side fully share wireless, transmission, power and other related resources, and the railway side reserves resources such as caverns, machine rooms, power, channels in advance through joint design and shared information. The three TSPs fully share wireless, power and transmission equipment, especially to jointly build one optical cable and share one set of equipment to further increase the sharing rate to save resources.



▲ Hangzhou-Huzhou Railway public network coverage project



Society



Case: Carrying out 5G network actions to empower Beijing's high-quality 5G networks

In order to solve the problems of difficult site selection, difficult access to site, high site rent and high proportion of power supply transfer in key areas of Beijing, the Company has given full play to its coordinating role and implemented the construction mode of "government-led, China Tower coordination, industry collaboration, social support, co-construction and sharing", and efficiently completed the full coverage of 5G networks in major national ministries, key universities, tertiary hospitals, cultural and tourism venues, transportation hubs and other important places. In 2022, the Company has built a total of 250 communication base stations and 131 sites for DAS systems, with the overall sharing rate of infrastructure over 65%, further enhancing Beijing's 5G networks coverage and consolidating the base of the digital economy, which was the icing on the cake for the creation of Beijing's "first strong network".



The Company has built a total of **250** communication base stations and **131** sites for DAS systems, with the overall sharing rate of infrastructure over **65%**.



▲ Exterior of the Ministry of Finance



▲ Exterior of the National Theater

Product and Technology Innovation

In 2022, the Company continued to carry out technology and product innovation around the 5G network, continued to increase investment in scientific and technological innovation and intensify efforts in tackling key problems, forged independent core innovation capabilities in an all-round way, and empowered the Company's high-quality development with scientific and technological innovation achievements.

5G DAS sharing

In 2022, the Company continued to strengthen technical research, created a batch of stable and durable DAS products with excellent performance, and proposed a series of simple, feasible, economical and shared solutions.

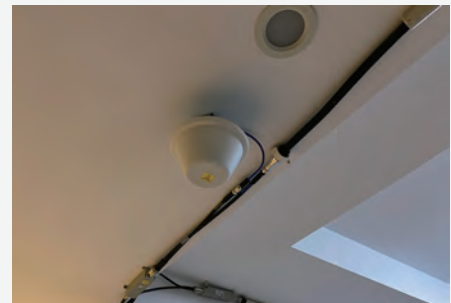


Full frequency passive DAS quick-installation products

Focusing on the problem that when multiple communication systems feed into the same DAS system, it is easy to cause the deterioration of system indicators, in 2022, the Company innovated and developed full frequency passive DAS quick-installation products, mainly including quick-installation connectors, bundled cables and passive device. The quick-installation connector adopts plug-in connection with features of easy installation and stable connection, with which the intermodulation suppression index of the system can be improved by 21% after each construction; based on the design of overlapping upper and lower channels and bundling the input and output ports of the quick-installation passive device, as well as the use of quick-installation bundled cables, the balance of the dual-branch system can be improved by 17%.

Case: Application of Passive DAS Quick-installation Products

In 2022, the passive DAS quick-installation products developed by the Company had been applied to different scenarios and different types of DAS projects across the country successively. In Shanxi, the quick-installation products were applied to new construction projects relating to the single-branch DAS system of apartments, which greatly enhanced the construction efficiency; in Jiangsu, the quick-installation products were applied to new construction projects relating to the double-branch DAS system of shopping malls, which effectively improved the system performance indicators; in Shanghai, the quick-installation products were applied to renovation projects relating to the original DAS system of office buildings, which saved the space occupied by the system and improved the aesthetics of the system.



▲ Example of passive DAS quick-installation products application

Society **Single-cable dual-stream MIMO innovative solution**

In order to solve the application problem of MIMO¹ technology in DAS scenarios with limited space, such as tunnels, the Company innovatively researched and applied single-cable dual-stream MIMO technology in 2022, which provided an idea for the construction and transformation of DAS scenarios with limited space.

Case: Single-cable dual-stream/dual-cable four-stream/four-cable eight-stream, twice the result with half the effort

The single-cable dual-stream MIMO solution researched and developed by the Company uses the SFN cell combining technology to upgrade the radio frequency signal in a single leaky coaxial cable from single-stream to dual-stream, thereby realizing the MIMO effect of the single-cable dual-stream. The solution is simple in construction and low cost in deployment. After the transformation of the single-cable scenario, the average download rate increased by 53% compared with that before the transformation, increased by 15% in the dual-cable scenario, and increased by 10% in the four-cable scenario, achieving the effect of increasing the speed and capacity of 5G networks without additional investment. At present, this solution has been applied in Zhengzhou subway tunnel.



▲ Example of four-cable scenario transformation solution application



The average download rate increased by **53%** compared with that before the transformation, increased by **15%** in the dual-cable scenario, and increased by **10%** in the four-cable scenario.

¹ MIMO technology refers to the technology that can multiply the capacity and spectrum utilization of the communication system without widening the bandwidth.



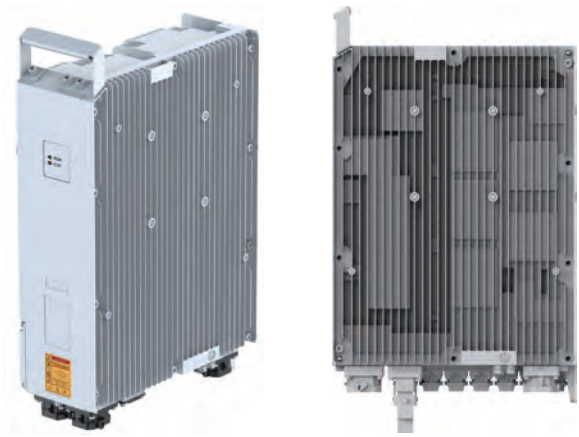
5G Power Products

To meet the new demand for 5G construction, the Company has focused on creating various special power supplies and ancillary facilities and continuously improved the level of green, digital, and high-efficiency products.

Outdoor integrated power supply standard products

In 2022, the Company researched and developed outdoor integrated power supply standard products, which are divided into three categories: 2kW, 3kW, and 6kW, and unified the size specifications of the products. In addition, the Company unified the stipulations on the shell structure, indicator lights, label marks, and installation hole positions of the outdoor integrated power supply, supporting the superimposed installation of equipment from different manufacturers and the parallel operation of power supplies with different capacities, which is convenient for maintenance and expansion installation; on the basis of the original 485 serial port, a network port, and a wireless communication interface are newly added, so that the upgrade time is less than 10 minutes, which greatly improves the upgrade rate of software.

Continuously improved
*the level of green,
digital, and
high-efficiency
products.*



▲ Outdoor integrated power supply standard products

Society **Modular 750V DC remote supply solution and product**

To adapt to the trend of C-RAN network construction of operators, reduce the construction investment of power supply supporting facilities of 5G base stations and create products more suitable for “centralized power supply and distributed power consumption”, the Company researched and developed modular 750V DC remote supply solution and product in 2022. The product adopts modular structure, its power module capacity has two specifications of 3.5kW and 5kW, with a variety of system configuration



▲ Modular 750V DC Remote Supply Product

options; the remote supply system equipment capacity has two specifications of 2kW and 4kW, and the equipment supports parallel machines to meet a variety of remote supply scenarios. The design of the modular structure made the system more flexible and avoided configuration redundancies, thus saving construction investment; it strengthened the safety performance of the system, added the output current limit, output short circuit, over temperature, insulation abnormalities and other protection functions to ensure safe and reliable operation and personal safety; it improved and unified the communication protocols of the equipment, supplemented the input status, system parameters, alarm status and other key signal amounts of the system, and completed the docking with the operation, maintenance and monitoring platform to facilitate the unified monitoring of equipment.



DC air conditioning products for photovoltaic base stations

To solve the problem of high power consumption of air conditioners at base stations, the Company actively promoted the green energy-saving construction of 5G base stations, developed a DC air conditioning product for photovoltaic base stations in 2022, and formulated a unified monitoring protocol to facilitate monitoring access and intelligent control. The product system could directly consume -48V DC photovoltaic power generation by adopting a full DC 48V power supply system, which can significantly increase the proportion of photovoltaic consumption. When the photovoltaic being insufficient, the product can be powered by switching power supply, in the meantime, it has the monitoring function for mains electricity, thus the air conditioner stops running when the photovoltaic is insufficient and power outage of mains electricity. Currently, the product has a seasonal energy efficiency ratio up to 5.2 during the cooling season, representing an increase of 10.6% compared to AC air conditioning products.

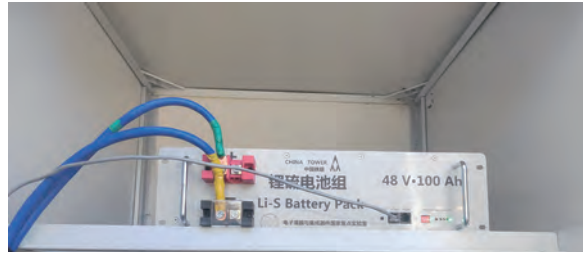


▲ DC air conditioning products for photovoltaic base stations



Society **Research and development of lithium-sulfur batteries technology and products for power backup in base stations**

Currently, due to the theoretical value of the battery material limitations of, it is difficult for lithium iron phosphate and lead-acid batteries to meet the base stations' requirements of high-power density and the trend of miniaturisation. There is a critical need to explore the higher energy density of battery products. In this regard, the Company carried out the research and development of lithium-sulfur batteries technology and products for power backup in base stations in 2022. And the products mentioned above are featured with high energy density, cheap price and cycle stability. In terms of the development of battery cells, the Company improved the electrochemical performance and safety performance of the products, and the energy density of the battery cell samples reached 355Wh/kg, representing twice as much as 170Wh/kg of lithium iron phosphate; in terms of PACK (lithium-ion battery pack), the Company fully drew on the experience and requirements of its own existing lithium iron phosphate batteries products, making improvement and optimization for the structure of lithium-sulfur batteries; in terms of BMS (Battery Management System), the Company optimized and improved the battery management parameters and alarming control of lithium-sulfur batteries one by one in a targeted manner, completed the development of the lithium-sulfur battery BMS prototype, achieved effective management of the pilot lithium-sulfur batteries. It can realize the Company's monitoring access to achieve real-time monitoring of the various performance parameters of the pilot batteries at the same time.



▲ Lithium-sulfur battery packs for power backup in base stations





Stacked light technology solutions and standardized products for base stations

To implement the national strategic goals of “Carbon Peaking” and “Carbon Neutrality”, the Company continued to improve the proportion of green power in base stations, and carried out research on the stacked light technology solutions and standardized products for base stations. The Company has formulated standardized solutions, standardized drawings and other selection designs and standard telecommunication protocols; the addition of an optimizer made a shielding-to-reduce-loss solution controlled by a single module possible, enabled effective reduction of power losses caused by shading in certain scenarios and improved power generation capacity by 16% to 51%; the measurement of the economic and social benefits from the DC stacked light project was conducted, and the cost of photovoltaic electricity in the pilot cities ranged from RMB0.39 to RMB0.57 per kWh, with a static investment payback period of 7-11 years in the pilot cities. The stacked light technology solutions for base stations effectively enhanced the core technical ability of green energy applications and promoted the construction of green base stations.



▲ Standardized products under the stacked light technology for base stations



Society **Innovation of Tower Structure**

To further improve the competitiveness of the Company's products and extend the low-cost construction coverage scenarios, the Company launched an innovative Cost-effective Technical Solutions for Building Surface Beautification Covers based on the Cost-effective Tower Standard Atlas V2.0, by systematic analysis of traditional building surface beautification products, research and selection of new materials, optimization of product structure and other initiatives. Compared with traditional building surface beautification products, the new beautification solution is more intensive and lightweight, reducing construction costs by 10%-20% under the same height and wind pressure, which can effectively meet the construction needs of building surface beautification covers projects under the urban beautification scenarios.



Reducing construction costs by
10%-20%

Case: Applying the innovative solutions for building surface beautification covers to reduce project construction costs

The innovative cost-effective technical solutions for building surface beautification covers researched and developed by the Company can meet the demand for environmental integration, reduce the cost of beautification covers and steel structure, and effectively enhance the competitiveness of building surface beautification products. In 2022, the Cost-effective Technical Solutions for Building Surface Beautification Covers has been piloted in Beijing, Guangdong, Jiangsu and other places.



▲ Application examples of cost-effective building surface beautification covers



(II) Empowering a wide range of industries by digital towers

The Company actively promoted high-quality development, accelerated digital transformation, and continued to build scientific and technological innovation and independent control capabilities. The Company actively grasped the opportunities for the development of the digital economy, and utilized its own core competitive advantages such as medium and high-point resources, a deep understanding of customers, a national unified monitoring platform, an industry-leading AI algorithm warehouse, integrated and shared big data, and perfect network information security protection, to constantly provide customers with digital services and promote the transformation from “telecommunication towers” to “digital towers”, fully supporting the construction of Digital China.

Tower Monitoring

The Company closely focused on the strategies of “Cyberpower” and “Digital China”, and fully leveraged resource advantages of “our extensive site coverage combining the strengths of various types of site and monitoring capabilities”. At present, the scale of the Company’s sites has reached 2.055 million all over the country. There are 5G on the telecommunication tower, optical cables below, shelters in the middle and uninterrupted power supply, forming a unique resource endowment. In recent years, while serving the industry, the Company has made full use of this resource endowment and professional operation advantages to create a unified and open national tower monitoring platform

around the digital needs of visual perception, data collection, and information processing, thus developing the “Tower Monitoring” product. The Company has installed “Thousand-Mile Eye (千里眼)”, “Fair-Wind Ear (順風耳)” and “Smart Brain (智慧腦)” for more than 40 industries through the tower infrastructure, 5G telecommunication network technology and AI algorithm analysis capabilities for application scenarios. More than 200,000 “telecommunication towers” have been transformed into “digital towers”, serving digital governance and empowering a wide range of industries.



Society 

As an internet product, “Tower Monitoring” focused on customer needs, with the characteristics of rapid iteration, data-driving, and experience-orientation. It has access to multiple-source data such as IoT devices, radar devices, satellite fire alarm data and meteorological data, becoming the first platform to achieve simultaneous access to multi-source data such as video, sensor devices, radar and satellite data. In 2022, “Tower Monitoring” continued to be iteratively optimized to support richer access and more professional application functions. According to the professionalism and universality of algorithm services, the newly introduced algorithms are divided into professional scene algorithms and universal scene algorithms, with a total of 122 types and 30 types, respectively.

The Company continued to create industry application products for monitoring. The company-level artificial intelligence key laboratory was based on neural network technology, adopted the PyTorch deep learning framework, used the unique medium and high point video surveillance large sample training set, built the algorithm sample library with the characteristics of the tower, independently developed and trained smoke and fire recognition, human, vehicles, boats and other behavior recognition algorithms. In 2022, the monitoring platform launched two self-developed industry application products, forestry and grassland and straw burning prohibition, and continued to create 10 cooperative industry application products such as environmental protection, land, fishery, emergency, transportation, etc., supporting a total of 24 key provinces and cities projects, and strived to better serve the national economy and people’s livelihoods and social governance. At the same time, facing digital needs such as visual perception and data collection, the Company launched customized edge gateway products with independent intellectual property rights, high cost performance, and strong scalability, which integrated functions such as network, computing and storage, performed local intelligent computing and processing of the accessed video streams close to the business site or at the edge of the network to avoid uploading non-essential data to the cloud platform, thereby reducing the consumption of network bandwidth and cloud storage resources, reducing business service costs and improving business response speed and data security, which could meet the digital upgrade and transformation needs of customers in different industries.



Independently developed and trained **smoke and fire recognition, human, vehicles, boats and other behavior recognition** algorithms.



Case: Smoke and fire recognition algorithm for accurate fire monitoring

The outdoor smoke and fire recognition algorithm based on medium and high points independently developed by the company-level artificial intelligence key laboratory has been integrated into the two self-developed monitoring applications of straw burning prohibition and forestry and grassland fire prevention. In the field of forestry and grassland fire prevention, this algorithm can save national inspection personnel and achieve early detection, early treatment and early prevention of fires. In the field of straw burning prohibition, this algorithm can realize accurate monitoring, positioning and timely processing of straw burning, helping the grassroots to win the blue sky defense war. This algorithm is designed for five categories of common smoke, chimney smoke, black smoke, fire and house smoke. The alarm category can be set according to the different needs of different users, fully meeting the needs of front-line customers for mid-high point monitoring and intelligent identification. By the end of 2022, the Company's smoke and fire recognition algorithm has been applied to about 5,000 cameras for production purpose. This algorithm is not only applied to outdoor smoke and fire recognition, but also has universal applicability to other small target recognition algorithms, which greatly reducing the requirements for algorithm models and the cost of algorithm ecological cooperation.



▲ Analysis of self-developed smoke and fire recognition algorithm



By the end of 2022, the Company's smoke and fire recognition algorithm has been applied to about **5,000** cameras for production purpose.



Society 

Case: Edge gateways customized products and solutions support digital transformation

For large bandwidth video streaming data and large connection IoT data, the Company uses its self-developed edge gateway, combines customer business scenarios, and flexibly loads intelligent AI algorithms to achieve local intelligent processing and fast response and improve the business experience, which currently has been applied to pilot projects such as prevention of forest fire, smart water conservancy, Yangtze River fishery ban, township comprehensive governance, and smart community in 8 prefecture-level cities in 7 provinces including Shandong, Henan, Hebei, Hubei, Sichuan, Jiangsu and Anhui.



▲ Customized edge gateways with proprietary intellectual property rights

Thoroughly complying with the requirements of national policy about farmland protection, the Company conducted real-time online monitoring towards over 70 million mu of farmland in 18 provinces (autonomous regions and municipalities) throughout the country, provided technical means for intelligent management and services of farmland protection, and helped supervisory departments to accurately and timely identify “non-agriculturalization” behaviors such as building houses, digging sand, mining and extracting soil on farmland, as well as the “non-food” behaviors such as planting trees, digging ponds, building plants and breeding facilities, making early identification and early prevention feasible. By the end of 2022, the Company had nearly 40,000 towers in total serving farmland protection, covering 80 prefecture-level cities in 18 provinces (including Hebei, Hunan, Anhui and Zhejiang), and assisted regulatory departments in finding more than 1,000 violations.



The Company had nearly **40,000** towers in total serving farmland protection.



Case: Project of smart protection of farmland to achieve zero violation in relation to farmland

In Zhejiang Province, relying on aerial monitoring points deployed throughout the province and the industry-leading AI recognition algorithms of more than 20 kind of natural resources for early warning, the Company created the natural resources business layer, carried out the whole process of the “farmland chief scheme (田长制)”, fully realizing supervision on farmland protection featuring all-weather, full real-time and high-efficiency, and solving the customer’s difficulties in identification, obtaining evidence and enforcement. At present, 14,892 points have been built in Zhejiang, covering more than 80% of the farmland area in 11 prefecture-level cities in the province, providing technical support and guarantee for the realization of zero violation in relation to farmland.



▲ Supervision on Zhejiang farmland protection

In addition, the Company established a homestead supervision platform through tower sharing, built a database for homestead qualification rights holders and land planning information, made intelligent comparison of application use qualifications, realized intelligent approval for homestead, and served the construction of digital villages in all aspects.



Society **Case: Sharing digital towers and building digital villages**

In Ganzhou, Jiangxi Province, the Company shared 65 communication towers to establish a homestead supervision platform, which covered more than 95% of villages in Dayu county and realized digital supervision for rural homestead usage. The platform combined with big data analysis automatic discrimination and automatic early warning, automatically analysed and alerted the machinery operations and building materials stacking involved in use of homestead. After receiving the early warning information, village cadres can discover the land use situation at the first time, carry out verification immediately, stop and investigate illegal behaviours immediately, in order to serve the construction of the digital villages.



▲ Digital supervision for rural homestead usage





Sharing smart towers

The core development concept of the Company’s Smart Tower business is “Sharing”. The sharing of Smart Tower business includes site resource sharing, professional capacity sharing, platform capacity sharing, industrial resource sharing and data sharing. The Company always adheres to the principle that “the Sharing of Resources and Capabilities is Limited, While the Sharing Space of Information and Data is Infinite”, and vigorously develops the sharing business of information and data.

The Company promoted advanced technologies such as Internet of Things and artificial intelligence in railway supervision, shipping supervision, civil aviation informatization and other fields, and helped to build a safe, convenient, efficient, green and economical intelligent transportation system in transportation industry. On a national scale, leveraging 1,191 site resources such as the sites along with provincial roads and national roads, the Company monitored 480 key road sections of 2,200 km roads by adopting 18 algorithms such as vehicle identification, road traffic time identification, traffic jam monitoring, parking incidents identification, pedestrian intrusion incidents identification, which has greatly solved the problems such as untimely monitoring and early warning and difficulties in comprehensive management of key road sections, key bridges and tunnels, geological disasters, dangerous slopes and road network operation conditions nationwide.

The Sharing of Resources and Capabilities is Limited, While the Sharing Space of Information and Data is Infinite





Case: Focused on monitoring and early warning and empowered by “intelligent solutions” to facilitate long-term effectiveness

At present, the Company has promoted the “intelligent solutions” in various regions across the country, helping local transportation competent authorities to build an intelligent management platform, which could make full use of the advantages on tower resource “sharing” to contribute to the construction of expressways, national and provincial trunk highways and rural roads and the improvement of the long-term management mechanism in an intelligent manner. In Jilin Province, for example, the Company entered into a comprehensive strategic agreement on informatization cooperation with the provincial Department of Transportation since 2020 to participate in the construction of “Internet + transportation regulation and service system” of Jilin Province and build the road network operation monitoring and integrated management system of normal national and provincial trunk highway of Jilin Province. Focusing on monitoring and early warning, the platform system realizes a range of functions including traffic event statistics, traffic event alarms and video network management for road ice and snow, spills and congestion. Figures are converted into charts through the integrated management platform, providing a data visualization service so that the trends of road changes are visible. The platform also fully leverages technologies such as wireless communication and others, integrates systems such as Beidou (北斗), GPS, GIS and image acquisition access and combines with various emergency command business system to realize the integrated mobile application of multi-terminal, multi-data and multi-business, which improves the efficiency of emergency office and response.



▲ Intelligent Road



Case: Timely response to railway emergencies with unique algorithm advantages

In August 2022, the Company provided Chengdu Railway Bureau with video monitoring technology service for high-speed railway key risk points and flood control points which applied the unique scenario intelligent perception algorithm to automatically perceive the scenario around the railway for AI intelligent analysis, timely detect the phenomenon of people, vehicles, foreign objects intruding the tracks and send an alarm immediately, so as to effectively reduce the risk of accidents. Furthermore, based on the research on the related needs of the current railway video monitoring, the Company built a smart railway platform integrating audio and video services, video AI intelligent analysis, alarm management, security management, IoT gateway management, client management and other functions and designed various data transmission network methods between different road sections and competent department of transportation, which can tailor the best solutions for users according to their needs, and formed intelligent and refined railway AI rapid empowerment mechanism to assist the security construction of railway road protection and inspection.



It can tailor the best solutions for users according to their needs, and form ***intelligent and refined*** railway AI rapid empowerment mechanism.



Society **Emergency Management**

The Company served emergency departments nationwide, and helped the early warning of disaster prevention and mitigation and the supervision of production safety. With the data from 20,000 machine shelters nationwide, the Company can analyze the data on service disruption, offline and power failure of towers, and further study and judge the severity level of various disasters such as floods and earthquakes and communications damage in these areas. By utilizing site resources to build 10,349 general earthquake monitoring stations nationwide, the Company assisted the China Earthquake Administration to build the “National Three-dimensional Earthquake Monitoring Networks”, formed high-quality earthquake early warning capabilities and intensity alerts capabilities based on actual township measured value in key areas such as the North China seismic belt, the coastal southeast China, the middle section of the Tianshan Mountains in Xinjiang, and Lhasa in Tibet, which provided protection for national earthquake prevention and disasters mitigation, emergency command and rapid rescue.



Utilizing site resources to build **10,349** general earthquake monitoring stations nationwide.

Case: Serving emergency rescue, ensuring people’s livelihood and security

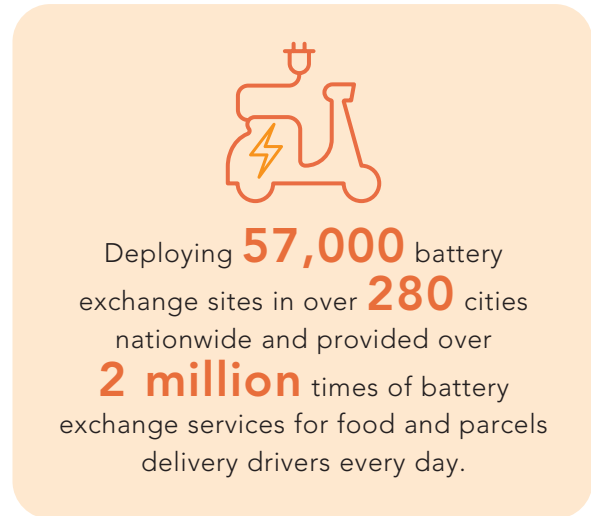
In Siming District, Xiamen City, Fujian Province, the Company has successively participated in the building of forest fire monitoring and early warning system supported by “12+7” road video in accordance with local requirements and combined with the characteristics of the Siming forest areas. Siming District has effectively realized the task objective of “Early Warning, Early Arrival and Early Disposal” by building a new pattern of “Intelligent Forest Fire Prevention”, strongly ensured the commitment of rapid response, constantly improved the level of comprehensive forest fire prevention and control, and resolutely guarded the people’s life and property security and urban ecological security with forest fire safety.



(III) Serving for people's livelihoods with smart energy

In order to deepen the sharing of energy applications and help to achieve the "dual carbon" goal, the Company actively responded to the government's requirements on prudently promoted the carbon peaking and carbon neutrality, and deployed 57,000 battery exchange sites in over 280 cities nationwide and provided over 2 million times of battery exchange services for food and parcels delivery drivers every day; deployed over 1.5293 million charging couplers and provided safe and convenient motorcycle charging services for nearly 10 million

residents; actively built the industry benchmark for power backup business, accumulatively served over 64,000 points in key industries such as communications, finance, public security, medical care and education, provided power assurance for important events and important social and economic activities, improved the level of urban emergency power assurance, and continuously enhanced the sense of security and happiness of the people.



Serving society with battery exchange business

Relying on its rich site resources, the smart monitoring platform which is "visible, manageable and controllable", and mature ancillary service systems in territories, the Company created the smart battery exchange service for the takeaway and the logistic industries. Battery exchange networks were deployed in the riders' hot spots to replace the traditional battery charging with a brand-new battery exchange mode, which significantly improved the charging efficiency for riders and addressed the safety concerns over battery charging effectively.

The Company practiced the new development philosophy consistently, accelerated the battery exchanging and charging infrastructures layout in an economic and efficient manner, and actively fulfilled its duty as a state-owned enterprise to do more practical work for the broad masses whole-heartedly. As of the end of 2022, over 350 "Riders' Homes" were set up in over 280 cities nationwide by the Company, 57,000 battery exchange outlets were deployed and over 3 million users registered on our platform, 902,000 food delivery riders and couriers were served by us, and more than 2 million times of battery exchange services per day were provided by us, enabling us being the largest battery exchange operator for light electric vehicles across China.

Society



Case: Building battery exchange outlets for outdoor laborers to do more practical work for the masses whole-heartedly

In Zhejiang Province, the Company actively participated in the practical activities under the theme of "I do more practical work for the public benefit". For the individuals employed in new forms such as riders in the logistics and the food delivery industries, we provided them with battery exchange services for low-speed electric vehicles, assisting them to address pain points like slow charging, lack of safety and short battery duration, to serve society and public well-being. As of the end of 2022, the Company built 4,300 battery exchange stations in 11 prefecture-level cities across Zhejiang Province in total, serving 50,000 food delivery riders in total, with more than 130,000 times of battery exchange per day.

At the same time, the Company actively cooperated with administrative and corporate entities of all levels across Zhejiang Province to incorporate battery exchange cabinets into the ancillary facilities of the "Urban Post", and assisted in creating the iconic brand of "Urban Post" and "Riders' Home". To care for riders group, we provided one-stop services for riders' daily work and life, such as recreation, haircut and legal literacy training. During the pandemic, outlets created the truly trustworthy "Workers' Harbor", offering convenience-for-people benefits such as stock freezing, preferential grants and presenting anti-pandemic gift packages, etc. As of the end of 2022, the Company co-built 88 "Service Outlets for Outdoor Laborers" and more than 200 battery exchange stations in total.



The Company co-built **88**
"Service Outlets for Outdoor
Laborers" and more than **200**
battery exchange stations in total.



▲ Activity of visiting riders



▲ Riders' Home in Jiaxing, Zhejiang



Charging business for the convenience and benefit of the public

Adhering to the people-centered philosophy of development, based on the national requirements for the charging of electric vehicles, the Company actively built livelihood projects, including low-speed electric vehicle charging piles for thousands of households in the community, providing centralized, fast and safe charging services, solving the problems like difficulties in charging and lack of safety, and relieving the pain points for people's livelihoods; and one-stop automobile charging piles for groups of enterprises such as public transportation, environmental sanitation, logistics and online ride-hailing drivers, providing new energy vehicle charging services for medium and high frequency users.

At present, there are over 1.4 million charging piles on the platform, serving over 10 million registered users, and there are 658 automobile charging stations and over 2,200 charging piles.

By the end of 2022, the Company's charging business had developed a total of 9,097,500 users for our low-speed charging with an increase of 3,865,500 for the year; operated 1,529,300 low-speed charging couplers with an increase of 456,300 for the year; and operated a total of 4,938 charging guns for new energy vehicles.



There are over **1.4** million charging piles on the platform, serving over **10** million registered users, and there are **658** automobile charging stations and over **2,200** charging piles.

Society 

Case: Advocating green and low-carbon development to help community residents to charge safely

At the beginning of 2022, in order to solve the problem of limited capacitance and limited space in the old community in Beijing, the Company carried out the construction project of low-speed charging equipment and platform, and started the research and development of the charging cabinet platform. After three months, the Company cooperated with the charging cabinet manufacturers to complete the launch of the tower charging cabinet platform, and the platform was launched on 1 July after several on-site equipment debugging, parameter adjustment and function verification, and charging cabinets were successively connected in Xicheng District and Fengtai District. The charging cabinet project effectively alleviates the safety hazards caused by residents' non-standard charging, improves the property management of electric vehicle parking, charging and anti-theft, and helps community residents to charge safely.



▲ Charging piles help residents charge safely



Case: Special charging station to ensure daily outdoor work

In Xinjiang Ili Cocodala, the lack of low-speed charging facilities in the urban area has resulted in insufficient vehicle endurance for landscaping and sanitation workers during their work, which affects their daily work. After learning about the needs of landscaping and sanitation workers, the Company took the initiative to invite them to visit the Company and introduce the development of the Company's energy operation business, which won their recognition and finally set up special charging stations for them. The low-speed charging pile service provided by the Company is an integrated service mode of "construction + platform + maintenance". A total of 12 low-speed electric vehicle charging stations had been built in Cocodala urban area to solve the charging difficulties for 500 sanitation workers in Cocodala, demonstrating the responsibility of state-owned enterprises through the practice of "I do more practical work for the public benefit".



▲ Low-speed electric vehicle charging piles

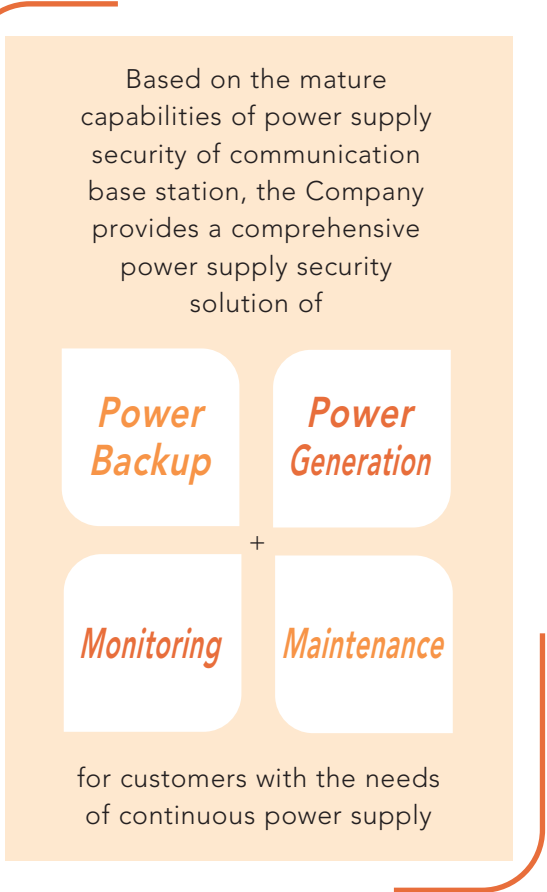


Society 

The power backup business ensures people's livelihood

Based on the mature capabilities of power backup of communication base station, the Company provides a comprehensive power backup solution of "Power Backup + Power Generation + Monitoring + Maintenance" for customers with the needs of uninterrupted power supply, which has been widely used in many fields such as communications, finance, public security, medical, petrochemical, government, and education.

By the end of 2022, the Company's power backup and power generation business had served more than 64,000 points in major industries such as communication and finance, with an increase of 34,400 for the year, providing power supply security for important events such as the World Table Tennis Championships and Provincial Games, as well as important social and economic activities such as the NPC and CPPCC, high school entrance examination and college entrance examination and the Conference of Tourism Industry Development, striving to improve the level of emergency power supply security in the city, and actively building an industry benchmark.



Case: Power backup for financial service outlets to ensure normal operation

In Xinyang, Henan Province, the Company carries out power backup and power generation business cooperation with Xinyang Post through multiple channels such as strategic cooperation and business synergy. The Company adopts the "Power Backup + Power Generation" mode to guarantee power supply. The Post rents the integrated uninterrupted power supply system unitedly customized by the Company. At the same time, the Company configures UPS with different power and lithium iron phosphate battery with different capacity according to the different load power of each postal outlet to provide power generation, maintenance and monitoring services, achieving 24-hour uninterrupted power backup services. This one-stop solution successfully solves customer problems, and quality products and good service have won the recognition of customers.



▲ Xinyang Post three-in-one power backup site



Society **Case: Power backup for the telecommunications industry to meet range requirements**

At the beginning of 2022, the Company understood that the investment budget of Guangxi Telecom was strictly controlled and the demand for network quality improvement shall be met through the procurement of services. The Company took the initiative to provide free testing services for customers to check the power backup situation of local network shelters, and eventually it was found that some of the customer's shelters had extended service of switching power supplies, batteries, high-power generators and other equipment, and the power backup hours could not meet the range requirements. So, it was urgent to update the overdue equipment. The Company provides communication shelters with power supply facilities supporting, comprehensive maintenance services and environmental supervision services for intelligent shelters for our customers' 127 key node shelters, which provides technical guarantee for customers to mitigate emergency situation about commercial power. Its timeliness and professional are highly recognized by operator customers.




▲ Power backup site of Guangxi telecom communication shelters with power supply facilities supporting



Low-carbon sharing and smart travelling

In 2022, as low-carbon economy has been upgraded as national strategy, the Company has grasped the two main lines of shared electric bicycles and urban supervision, rapidly combined the industrial ecological industrial chain, cooperated with energy company to create campus market travel service solutions, so as to assist urban supervision and create convenient experience of shared electric vehicles.



The Company has grasped the two main lines of **shared electric bicycles** and **urban supervision**, rapidly combined the industrial ecological industrial chain.

The Company initiated the research and development of shared electric bicycle supervision platform in January 2022 and completed a closed-loop supervision package containing supervision platform, supervision screen and illegal investment inspection program within three months, which helps the government urban management and regulates civilized parking for the public. Since the supervision package was launched in early 2022, the Company has actively cooperated with local governments and relevant departments to promote the pilot work of shared electric bicycle supervision services in various provinces and prefecture-level cities across the country. At present, more than 3,000 electric bicycles have been put on the road in regions such as Wuhan, Hubei and Tangshan, Hebei. At the same time, the Company continues to collect needs in the process of communicating with various places and optimizes and upgrades various functions of the supervision platform package efficiently and quickly. Currently, more than five versions have been optimized and launched, effectively improving the friendliness, convenience, practicability, and aesthetics of the package and greatly enhancing the competitiveness, management, and capabilities of the Company's products.



▲ Shared electric bicycle supervision platform

Society 

Up to now, the Company has completed the development of a multi-functional intelligent shared electric bicycle operation platform equipped with vehicle central control docking, electronic fence drawing, vehicle online scheduling, vehicle power replacement operation and maintenance, service area demarcation, billing package configuration, etc., which is currently launched and entered into the stage of pilot operation. The platform adopts the self-developed components of the platform innovation center and the latest platform architecture to ensure the access capability of hundreds of thousands of vehicles, and will subsequently form a golden product portfolio with the supervision platform package, to collaboratively serve both B and C dual-end users in the field of shared electric bicycle travel, creating a highly competitive Tower sharing travel brand.



▲ Intelligent shared electric bicycle operation platform



▲ Pilots for shared electric bicycles in Tower Industrial Park



Case: Shared electric bicycles on campus supporting green travel

In Hubei Province, the Company and the School of Computer Science, Hubei University of Technology (“HBUT”) jointly participated in the research on the topic of standardized parking solutions for urban shared electric bicycles based on 5G high-precision RTK positioning. The Company was granted access to operate shared electric bicycles in Hubei University of Technology in an affiliated mode, and the first batch of 200 bicycles was placed to serve 21,000 students and teachers on campus. In 2022, the cumulative number of registered users on campus amounted to 19,000, with an average bicycle turn-over rate of 11.73. As a practitioner of “carbon neutrality”, the Company has been committed to green campus construction. According to calculations, each shared electric bicycle can contribute 558 grams of carbon reduction a day, and the total carbon emission reduction during the operation amounted to 10 tons.



▲ Shared electric bicycles placed on campus

Taking the case of HBUT shared electric bicycles as a typical example, the Company replicated and promoted it in various tertiary institutions in the province. Currently, the Company has gained access to operate in Wuhan University of Technology, Wuhan Institute of Design and Sciences, Hubei College of Chinese Medicine, Xiantao Vocational College and other tertiary institutions and continued to build green travel campuses, with an expected annual carbon reduction of over 600 tons.



Society 

II. Caring for employees to achieve development

Focusing on the Company's strategic goals and overall requirements, China Tower adheres to the concept that "every employee is a talent and should be a talent", fully implements the strategy of empowering the Company with talent and regards employees as the foundation and a treasure of sustainable development. Adhering to a people-oriented management philosophy, the Company earnestly protected the rights and interests of employees, and created a fair, harmonious, healthy and friendly working environment for them. The Company also took a number of measures to ensure the physical and mental health of employees, and helped employees to continuously improve themselves and develop with the Company.



Adhering to the concept that
**"every employee
 is a talent and
 should be a
 talent"**

(I) Protecting the rights and interests of employees adhering to a "people-oriented" philosophy

The Company attached great importance to protecting the rights and interests of employees and strictly followed the Labor Law of the People's Republic of China, Labor Contract Law of the People's Republic of China, Social Insurance Law of the People's Republic of China, Provisions on the Prohibition of Using Child Labor and other laws and regulations. The Company formulated Administrative Measures on Staff Recruitment (for Trial Implementation), Labor Contract Management Measures, Training Management Measures and Measures of China Tower Corporation Limited for Management of Staff Attendance and Leave and other rules and regulations to improve and optimize the management in staff recruitment and dismissal, remuneration and welfare, attendance and performance, working hours and vacation, and devoted itself to provide a fair-competition, anti-discrimination and diverse working environment. The Company strictly prohibited unequal treatment based on race, age, gender, ethnicity, religious belief, etc. and banned use of child labor and forced labor to effectively protect the rights and interests of employees.





The Company adhered to the improving the mechanism and management mode that promotes employee development, deepening the promotion of the flat reform of organizational structure, and developing and fostering highly efficient and dynamic work teams. The Company continued to improve the flexible and dynamic promotion mechanism and encourage talents to develop in multiple paths in all respects to attract, motivate and retain talents more effectively.

With post value as the basis, performance as the orientation, salary level in labor market as the reference and in combination with the economic benefits of enterprise, the Company established a remuneration incentive system in a reasonable manner, reflecting staff's work performance and substantive contribution and promoting them to make improvements through their remuneration. The Company implemented the restricted share incentive scheme, covering the management and core technical talents who made positive contributions to the Company's overall performance and sustainable development, to encourage them to continue to give full play to their enthusiasm, initiative and creativity. At the same time, the Company paid attention to the combination of material encouragement and spiritual encouragement, fully recognized and respected employees who have made outstanding contributions to the development of the Company through circulation of notice of commendation and honorary titles, so as to enhance their subjective initiative to contribute their effort to the development and construction of the Company.

In respect of democratic management, the Company continued to improve the corporate democratic management system based on the employee representative conference, further clarifying and improving the functions of employee representative conference, such as the right to recommendation, consideration, approval, supervision, evaluation, democratic election, and other rights conferred by laws and regulations. The Company actively carried out the collection and processing of proposals from employee representatives and submitted system and measures involved employees' practical benefits, such as their training and management, to the employee representative conference for consideration, so as to smooth channels for democratic expressions, protect the legal rights and interests of employees and give full play to staff's role of master. In addition, the Company enriched the forms of democratic participation of employees and organized and carried out the activity – "My contribution to the development of China Tower" collecting reasonable suggestions from employees, to continuously create a good atmosphere of loving enterprise, offering good advice and making contribution for the high-quality development of the Company.



Society



Case: Youth with China Tower – 2023 Autumn Campus Recruitment

The Company continued to carry out online recruitment campaign with job postings published on major recruitment websites and target tertiary institutions in the autumn of 2023. It was the first time that the Company added VR online mutual selection to help graduates more visually understand the enterprise and positions through the form of virtual reality. This online campaign involved the Headquarters and branches in 31 provinces, autonomous regions and municipalities. The videos were played 560,000 times. In addition, the Company vertically publicized at 95 colleges and universities through the employment network, BBS, official account, social groups, SMS invitation and other platforms, reaching 850,000 candidates, fully showing the corporate culture characteristics and humanistic care philosophy of China Tower and demonstrating key training policy for fresh graduates.

The Company won “Annual China Best Employer Award” and “School Recruitment Demonstration Award” granted by Zhaopin.com for four consecutive years from 2019 to 2022. The Company won “Model Employer Award in China” granted by 51job.com for three consecutive years from 2020 to 2022.



▲ Campus recruitment poser in the autumn of 2023 and VR online mutual selection

(II) Strictly enforcing safety responsibilities

Work safety is vital to people’s life and property safety, the development of the Company and the stability of society. The Company has firmly established the concept of safety development and strictly enforced responsibilities of work safety, focusing on establishment of institutional mechanisms, implementation of responsibility system, screening and rectification of hidden dangers, management of cooperative units, so as to firmly prevent and solve safety risks, resolutely keep the bottom line of safety development, comprehensively improve safety level of the Company and facilitate its high-quality and sustainable development.



Construction of safety management system

The Company continuously improved work safety system and established a characteristic top-level planning and design for safety management – “0361” safety management system for tower captain system. The Company issued the “Plan for Implementation of “0361” Work Safety Management System for Tower Captain System of China Tower”, which implemented three levels of safety responsibilities of subjects, supervisors and regulators and established “tower captain system” in the whole system. This plan specified 15,000 “tower captains” in total, work duties and requirement of working time limits of each unit, and work responsibilities and required actions of “tower captain” in each line, fully promoting the effective implementation of “0361” work safety management system for tower captain system.

In 2022, the Company formulated or revised over 40 rules and regulations, including “Measures of China Tower Corporation Limited for Implementation of Reward and Penalty of Work Safety (for Trial Implementation)”, “Measures of China Tower Corporation Limited for Work Accident Reporting, Investigation and Handling”, “Requirements of China Tower Corporation Limited for Warehouse Safety Management” and improved system basis for work safety management. In addition, the Company required all provincial and municipal branches to set up safety committees and safety committees offices, equipped with full-time and part-time personnel for work safety management to effectively implement safety management responsibilities and promote the development of work safety.

Development of work safety culture

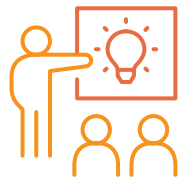
In 2022, the Company held work safety meetings and warning and education conferences regularly to deploy work safety priorities and raise the safety awareness of all staff. At the same time, the director of the Company’s safety committee signed a letter of responsibility for safety with all provincial branches to implement safety responsibilities at all levels and strengthen work safety management.



▲ Video conference on work safety

Society **Case: Studying on the theme of “Work Safety Month” to ensure work safety together**

In June 2022, the Company organized a “Work Safety Month” themed activity, focused on studying the television topic piece named “Life is more important than Mount Tai (生命重於泰山)”, and promoted the implementation of the 15 measures for work safety. The Company produced publicity boards on the “New Safety Law” and conducted 1,509 activities such as special study seminars, focused lectures, training and counselling and viewing of educational films, attracting 22,400 employees. The Company actively carried out publicity activities on the theme of the Work Safety Law and published 790 news reports on its own media and social platforms; organized 832 emergency rescue drills, fire drills and knowledge and skills training for all staff, attracting 34,300 participants; carried out “I Am a Safety Whistle Blower (我是安全吹哨人)” and identified 390 problems; organized “Safety Promotion Consultation Day” activity and carried out online safety knowledge competitions such as “How much do you know about the new Security Law” and other popularization activities, organized a total of 499 activities, attracting 43,000 participants.



The Company produced publicity boards on the **“New Safety Law”** and conducted **1,509** activities such as special study seminars, focused lectures, training and counselling and viewing of educational films, attracting **22,400** employees.



▲ The “New Safety Law” publicity boards



▲ Fire drill



Strengthen safety risk prevention

In 2022, the Company carried out the investigation and rectification of potential risks for “six full (六個全量)” in the whole system, including full sites, full offices, full construction projects, full cooperative units, full equipment and facilities for Two Wings business and full storage warehouses, and established a normalized and long-term implementation of investigation and rectification of potential risks mechanism. The Company had a closed-loop management for the governance of potential risks by determining the personnel responsible for rectification, rectification measures, rectification completion time, rectification completion personnel and rectification acceptance personnel, and established a comprehensive risk prevention mechanism to improve the anti-risk ability.

The Company concentrated on the investigation and rectification of potential risks in key areas according to the seasonal changes and the actual work, discovered 422,000 potential risks of all kinds in total throughout the year, and rectified 421,600 potential risks with rectification completion rate of 99.99%, effectively preventing the major safety risks.



Discovered **422,000** potential risks of all kinds in total throughout the year, and rectified **421,600** potential risks with rectification completion rate of **99.99%**.

Society 

Comprehensive departments at all levels

- Kept a close eye on the investigation and rectification of potential risks for fire and electricity safety in the comprehensive building for production
- Carried out fire acceptance and inspection of offices
- Paid close attention to the investigation and rectification of potential risks for the external facade insulation system and fire protection system
- Comprehensively strengthened non-smoking administration

Distribution, operation and maintenance departments at all levels

- Ensured the construction safety, and maintenance and renovation safety of sites in sensitive places of the Party, government and army, personnel intensive places and forest, grassland and mountainous areas
- Carried out the investigation and rectification of fire hazards in autumn and winter, and 164,500 sites located in the forest and grassland areas were investigated in full
- Focused on the rectification of potential risks caused by bare wires and completion of rectification pilot work for cascade batteries

Smart Tower departments at all levels

- Strengthened the investigation and rectification of potential risks for equipment fixation and electricity
- Carried out special safety hazard inspection of the advertising business and special clearance of retired equipment

Energy departments at all levels

- Focused on potential risks of fire, smoke and electric shock of equipment
- Carried out high-quality investigation and rectification of potential risks for batteries, charging stations and energy storage equipment

Procurement management departments at all levels

- Strengthened the investigation of fire hazards for storage warehouse
- Improved safety measures for battery storage



Case: Dual management and control mechanism to help to realize the safety of the operation of municipal grids assets

In 2022, the Company attached great importance to the safety of the operation of municipal grids assets, focused on “Detailed Information, Identified Risk, Eliminated Hidden Dangers and Distinct Responsibility” of municipal grids assets and organized to carry out the special action for information archiving and hidden dangers identification and rectification of outside city grids assets. While establishing the responsibility system of the “tower captain system”, the Company clarified the persons responsible for work safety site-by-site, completed site assets archiving in full, established safety risks list of municipal grids, carried out special actions for special hidden dangers rectification, and implemented high-risk scenarios on-site operation management.



▲ Archiving and investigation and rectification of hidden dangers of municipal grids assets



Society >>

Case: Relying on the "four-in-one" to implement the rectification of safety hazards in battery exchange cabinets

In 2022, the Company studied and judged in advance, reasonably deployed, conscientiously implemented the rectification of safety hazards in battery exchange cabinets to guarantee the safety of the battery exchange business in strict accordance with the requirements of work safety management.

1

The Company strengthened the investigation and rectification of equipment's hidden dangers, and concentrated on the rectification of city grids lines, grounding, internal circuit, cabinet sanitary environment and battery safety of battery exchange cabinets;



2

The Company strengthened safety protection of operators, required front-line maintainers to strictly implement safety disclosure and took protective measures (wearing safety helmets and insulating gloves) during the operation;



▲ Investigation and rectification of hidden dangers of energy battery exchange cabinets

3

The Company strengthened user safety guidance, conducted real-time communication with users to correctly guide them to exchange battery safely, and carried out work safety management throughout the whole process of battery exchange business.



Case: Focus on the rectification of potential fire hazards in the workplace to create a safe and stable office environment

In 2022, the Company promoted the grid-based screening and rectification of potential risks of fire and electricity safety of the comprehensive building for production, paid close attention to the acceptance of fire inspection in the offices, supervised the investigation of hidden dangers in external facade insulation systems and fire protection systems, and comprehensively strengthened the management of smoking ban and tobacco control in public places. The Company invited fire safety assessment units and professionals from fire protection institutions to provide on-site guidance to “diagnosing the pulse and prescribing the right medicine” for the fire protection situation of office buildings, implemented fire protection rectification measures, and created a safe and stable office environment to ensure office safety.



▲ Investigation and rectification of potential fire hazards in the offices



Society 

Employee health and safety guarantee

Under the normalized environment of epidemic prevention and control, the Company has always put the life safety and health of employees in the first place, and has always and cautiously carried out the prevention and control of the epidemic. In 2022, the Company held a total of 6 special meetings on epidemic prevention, issued 7 guidance documents on epidemic prevention and control, compiled and distributed 54 epidemic briefings, held system-wide video training on “Novel Coronavirus Pneumonia Prevention and Control Plan (Ninth Edition)”, implemented responsibilities at all levels, refined prevention and control measures, improved disposal plans, and built a solid barrier for the company’s epidemic prevention and control. The Company strictly implemented various epidemic prevention measures, coordinated vaccination vehicles, promoted vaccination, carried out nucleic acid testing and environmental disinfection in epidemic-related areas, and provided masks, disinfection supplies and other materials, ensuring the stable and orderly adjustment and transformation of epidemic prevention and control measures.



▲ Organizing nucleic acid testing for employees



▲ Promoting vaccination among employees



▲ Carrying out video training on epidemic prevention plans





Safety of maintenance personnel among commissioned partners

The Company continued to regulate and strengthen management of cooperative units, and paid close attention to the construction of institutional mechanisms and the implementation of the responsibility system to protect the life and property safety of the Company’s cooperative units. In 2022, the Company formulated and issued the “Five Unifications and Two Inspections” Management Measures for Production Safety of Operation and Maintenance Cooperative Units 《運維合作單位安全生產“五統一兩查”管理辦法》 to detail the work into twelve specific measures and requirements in six aspects, requiring the branches to inspect and supervise the implementation of such measures by the cooperative units on a monthly basis. The Company signed the Production Safety Management Agreement with each cooperative unit, which stipulated that the cooperative units shall conduct self-inspection and self-rectification and rectify the production safety problems found in a timely manner. The Company included all partners into its platform for management to ensure that the production safety of the cooperative units is controllable and under control and strive to achieve “zero accident” and “zero casualty” in the production safety of the cooperative units. In the meantime, the Company required all cooperative units to implement the Work Safety Law of the People’s Republic of China 《中華人民共和國安全生產法》 and other provisions, standardize and improve the production safety responsibility system management of the Company’s operation and maintenance line to clarify the production safety responsibilities, establish and strengthen the safety production responsibility system among all employees by formulating department goals and hierarchy goals and designating responsible persons, so as to make all employees understand responsibilities, clarify responsibilities, take responsibilities and perform responsibilities.



▲ Mechanism construction and responsibility training



▲ Spot check for the qualifications of front-line personnel for operation



Society 

In 2022, the Company strengthened the safety management of site operations as a priority, incorporated the maintenance personnel into the “three-level tower captain” management, and established the safety disclosure system with “one meeting, two cards”. Through the daily safety technical disclosure with one meeting two cards, all the maintenance personnel among commissioned partners had the knowledge of the overview, characteristics, and risk factors in the day’s operations, clarifying the measures to prevent accidents and the safety matters that should be paid attention to during the operations, which in turn could effectively contain non-compliance operations and ensure the personal safety of operators. The Company actively strengthened the operation training on registered maintenance operators, by virtue of recording and disseminating standardized operation videos, allowing all maintenance personnel to master the operation specifications for safety production and the emergency measures and methods in case of an accident, so as to improve the safety production management in all respects.

Case: Innovative development of management platform for safe operation to ensure the safety of workers

Based on the integrated technology applications, including cloud computing, Internet of Things, big data and AI intelligent identification, the Company has innovatively developed a management platform for safe operation, which puts the identity information of all operators into the archives. The platform could identify and remind operators to wear protective equipment through smart devices, report and demonstrate operations at greater risk in advance, and dispatch special personnel to supervise the operation process, save and upload operation video records, to eliminate non-compliance operations that do not meet safety requirements and reduce the safety risks caused by non-compliance operations. Focusing on key links such as safety disclosure specifications and high-risk operations, the quality inspection team conducted inspections through unannounced checks, remote video inspections and reverse attendance checks, and regularly gave warnings and punishments for units and individuals that do not perform properly to ensure effective implementation of safety responsibilities.



▲ Management platform for safety operation




(III) Care for employees by various measures

The Company regards employee physical and mental health as an important foundation for its own development, and provides employees with comprehensive benefits and a safe working environment, which enhances employees' sense of belonging and security.

The Company continuously enriches the employee's welfare security system. In addition to providing basic pension insurance, basic medical insurance, unemployment insurance, work-related injury insurance, maternity insurance, housing provident fund and corporate annuities for all contract employees in accordance with relevant national laws and regulations, the Company has also established a comprehensive medical insurance system, which is based on basic medical insurance and supported by supplementary medical insurance, critical illness insurance and personal accident insurance, covering employees and their family members.

The Company gives warm care to employees and takes concrete actions to protect their physical and mental health, enhancing employees' sense of belonging and happiness:

- 
- provides additional benefits on important festivals and employees' birthday
 - offers various subsidies for transportation, business travel, heatstroke prevention, meals and heating, and health examinations and psychological tests
 - carries out activities such as caring for and consoling sick employees and female employees and arranging fellowship for single employees
 - organizes colorful and healthy cultural and sports activities
 - sets up baby care rooms for female employees and offers refrigerators, disinfection cabinets, sofas and other facilities

Case: Mid-Autumn Festival themed activities to celebrate the reunion festival together

On the Mid-Autumn Festival in 2022, considering that certain employees were unable to go home to reunite with their families, the Company organized colorful themed activities, including cultural lectures, folk activities, traditional games, etc., the Company's employees gathered together to spend a meaningful Mid-Autumn festival.



▲ Mid-Autumn Festival themed activities

Society 

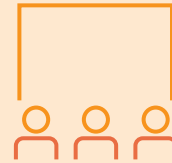
(IV) The “Talents Make Business Strong” strategy

The Company established the flexible and efficient talent recruitment mechanism based on talents, the talent selection mechanism with broad vision and competitive merit, the talent cultivation mechanism with comprehensive system and personalized training, the talent utilization mechanism based on making full use of their talents, the talent retention mechanism with effective incentives and more caring for them, and the employment management mechanism with the principle of transferring to other jobs at the top or at the grass roots and replacing incapable employees with capable ones as required, further promoting the systematic construction of the whole life cycle of talents.

The Company deeply implements the strategy of empowering the Company with talent, systematically optimizes the talent development system, training system, inheritance system, motivation system and guarantee system, promotes the formation of three teams composed of managerial and administrative personnel, scientific and technological personnel, and professionals with complete levels, sufficient numbers, reasonable structures and appropriate capabilities, shapes a new landscape of systematic talent development via “Election, Education, Deployment and Retention” for existing employees and the “Recruitment, Training, Management and Application” practices for new employees, which provides strong talent support for the Company to construct an operating system that is professional, intensive, delicate, efficient and digitalized, build an enterprise centered around sharing, service, innovation, technology and value creation, and promote high-quality development.



General managers of branches at prefecture level cities have trained more than **200** trainees in total



To help new employees accelerate the role transformation and adapt to job requirements, with more than **700** trainees participated.



The Company has established a comprehensive and systematic training mechanism, covering all staff from fresh graduates to management. In 2022, the Company carried out in-depth cooperation with China Business Executives Academy, Dalian and offered a training for general managers of branches at prefecture level cities for one week, with a total of three sessions. The total number of trainees was more than 200, covering themes such as compliance management, risk prevention and control, work safety and leadership improvement. Famous experts and Company's leaders were invited to participate in the lectures, which further helped the first-line management to strengthen risk awareness and improve their ability to perform duties. At the same time, in order to improve the professionalism of new employees and strengthen their professional ability, the Company held the "Set-Sail Program" training camp for new employees this year. The heads of the headquarter departments and external experts jointly formed a team of lecturers to give detailed lectures around the Company's strategy, business, culture, rules and regulations, as well as the comprehensive ability and quality of new employees, so as to help new employees accelerate the role transformation and adapt to job requirements. The training lasted for two weeks, with a total of seven sessions and more than 700 trainees participated.

To give full play to the functions of innovation studios in leading demonstrations, gathering wisdom for innovation, coordinating research breakthrough, inheriting skills and cultivating spirit, the Company vigorously carried out the foundation of model workers (employees) innovation studios, and the first batch of 10 demonstrative China Tower model workers (employees) innovation studios were listed and named in 2022.



▲ First-line management training



▲ "Set-Sail Program" training camp

Society **Case: Tower e-Learning online learning platform is an accelerator for the learning and growth of all employees**

In order to fully meet the needs of talent development, in 2022, the Company actively expanded the channels and means of education and training, made full use of mobile internet, big data and artificial intelligence technology, and created a comprehensive learning platform based on three-in-one functions of online learning, knowledge sharing and teaching management – Tower e-Learning, which fully integrated internal and external high-quality lecturers and course resources, and currently had been configured more than 200 online courses and 7 special learning topics.



▲ Tower e-Learning online learning platform

Case: Made further efforts in Tower Academy Open Courses, improved comprehensive quality of the staff

In order to continuously improve the general ability and quality of staff, create a learning atmosphere for all staff, the Company continued to make further efforts in the brand of Tower Academy Open Courses in 2022, and launched high-quality live courses that employees enjoyed monthly, covering numerous themes closely related to the development of the Company and employees, such as macro economic trend, “dual carbon” economy, digital economy, communication technology, efficient office, etc. A total of 12 courses have been launched, and the total number of participants has exceeded 30,000.



▲ Tower Academy Open Courses



III. Facilitating the improvement of public well-being

China Tower actively fulfilled its responsibility and obligation of providing communication operations and inclusive communication, gave full play to its capability and resource advantages, did a good job in emergency communication operations during important activities and major disasters, and helped to eliminate the Digital Divide in remote areas. In addition, the Company actively paid attention to the community needs, carried out a large amount of community charity work in relation to helping the elderly, children and those in distress, and gave full play to employees' abilities and motivations of volunteer services to build a community with a shared future for humans.

(I) Fulfilling the responsibility of providing support for communications

The Company adhered to the concept of "people first and life first", and actively fulfilled its responsibility of providing emergency communication services, providing emergency communication support for disaster relief and important activities. In 2022, the Company invested 712,000 employees, 358,400 vehicles, 598,000 diesel engines, 95,000 patrol inspections at the stations, 128,000 times of power generation throughout the year for support in emergency relief and important activities, successfully completed more than 470 emergency and important communication support tasks, and won more than 10 awards and commendations at all levels.

In order to enhance the emergency support capacity, the Company set up a communication support leadership group and established a three-tier docking and collaborative work mechanism with the telecommunication operation enterprises to jointly develop the security and emergency response plan, integrate the available security forces of the cooperative units and the society into the mechanism, plan and system, and form an overall joint force to fully improve the level of flood prevention, emergency rescue and disaster relief capability, do a good job in all aspects of communication support. In 2022, the Company forcefully responded to 43 times of heavy rainfall and flood disasters in South China, Jiangnan and Northeast China, the 6.9 magnitude earthquake in Menyuan, Qinghai Province, the 6.1 magnitude earthquake in Lushan and the 6.8 magnitude earthquake in Luding in Sichuan Province, and the COVID-19 public health event across the country, ensuring the overall stability of the national communication support, which was highly recognized by local governments at all levels.

Society 

The Company insisted on doing a good job in the communication security for major events by conducting strict inspection and acting prudently all along to fully grasp the work of communications service security for major events. The Company successfully completed the communication and service security work of major events such as the 2022 Beijing Winter Olympic and Winter Paralympic Games, the National “Two Sessions”, the Fifth Shanghai International Import Expo, the World Internet Conference and has achieved the established goals of “zero outage, zero failure, zero complaint” for network communication and service support, “zero paralysis, zero leakage, zero theft, zero tampering, and zero penetration” for network information security guarantee, and “zero accident, zero casualty” for safety production, and “zero pandemic and zero infection” for pandemic prevention and control.

Leveraging its mature base station power backup capability, the Company fully shared the local power backup and power generation equipment resources, and construction and maintenance capabilities, offered a four-in-one and comprehensive power supply security solution covering power backup, power generation, monitoring and maintenance, and proactively ensured power stability of important forum.



▲ Site of the emergency support for flood control and rescue



▲ The emergency support works have been highly recognized by local governments at various levels



Case: With the guarantee for stable power, the 56th World Table Tennis Championships were held successfully

The World Table Tennis Championships in Chengdu was the world's highest level and largest-scaled table tennis event in 2022. The Company undertook the power guarantee project of World Table Tennis Championships, installed a total of 20 UPSs, 4 ATS dual power switch cabinets and 1 set of 1250KVA diesel generator, and collaborated to set up power guarantee team of 27 experienced electrical technicians, providing strong and powerful support for the smooth holding of this event. At the same time, in order to ensure 24-hour smooth operation of the valve room under the project, the Company formulated comprehensive emergency plans, specifying all position responsibilities and emergency response methods. By establishing a communication mechanism with relevant power supply security departments, the Company successfully passed the on-site safety inspection and acceptance, and completed on-site equipment acceptance and emergency drill, ensuring the safety of overall power security system, which were unanimously recognized by the local government and organizing committee.



▲ Power security site for the 56th World Table Tennis Championships



Society **(II) Facilitating elimination of the Digital Divide**

The Company has always fulfilled the social responsibility of state-owned enterprises, comprehensively implemented national strategy of “new infrastructure construction” and technology innovation development by fulfilling the universal service obligation and continuously strengthening the construction of communication infrastructure in remote areas and poor villages and towns, to vigorously promote the construction of rural communication infrastructure and help various rural industries flourish. As of the end of 2022, it had undertaken 57,400 pilot projects of universal telecom services and 3,626 border sites. In 2022, we undertook 5,210 pilot projects of universal telecom service and 505 border sites, providing a strong support of information and communication infrastructure for rural revitalization and helping administrative villages across the country to fully open up an information highway and effectively eliminate the Digital Divide.

(III) Working together to build a good community

The Company actively responded to the requirements of local communities and took its own resource advantages to carry out various community contribution public service activities. It also paid attention to the social groups for their special hardship and helped each other in times of difficulty, which contributed a solid force for the improvement of public well-being.

Case: Deeply respond to the group’s needs and vigorously care for community workers

In Anhui Province, taking the “The Riders’ Home” as the offline activity vehicle, the Company provided free legal aid services for couriers and delivery riders, and widely conducted service projects concerned by workers, such as vocational education and training, holiday gifts, hardship assistance and heart-warming actions. During the pandemic, the Company conducted normal inspections of the battery exchange facilities and regular disinfection of the battery exchange cabinets, distributed anti-pandemic materials for food deliverymen to ensure that the demands for battery exchange of food deliverymen who were on the front-line for combating the pandemic were guaranteed in time, and bolstered the anti-pandemic war in full efforts. At the same time, the Company has held several pandemic preferential activities for users who were unable to use the battery exchange service due to pandemic control, which helped the separated personnel to fight against the pandemic at ease and relieved them of worries thereof.



Case: Ensure smooth communication and protect the safety of Lu'an

Considering that blizzard weather and electricity overload may bring adverse effects on the whole city's epidemic prevention and control, the Company actively participated in works on the emergency rescue for communication security of the community by setting up "young pioneers positions and volunteer service teams" and others. The Company has prepared emergency plans in advance and has set up 50 teams for power backup and power generation. Taking advantage of more than 6,000 site resources in the city, backup power construction, professional maintenance, 7*24 hours security and other services, the Company provided free power connection and power generation services for epidemic detection points, medical and health units, township health centers, key office places and other power utilization units to ensure the safe and stable operation of key facilities and equipment, such as public health emergency response, vaccine cold chain, blood and special medicine storage, surgery, and video surveillance systems, in case of power interruption.



▲ Activities of emergency rescue for communication security in Lu'an City, Anhui Province



The Company has prepared emergency plans in advance and has set up **50** teams for power backup and power generation.



Society 

(IV) Engaging in volunteer services

The Company fulfilled its corporate social responsibility, actively gave back to the society and encouraged employees to participate in volunteer services. In 2022, the Company registered 163 youth volunteer organizations and organized a total of 962 volunteer service activities.



In 2022, the Company registered **163** youth volunteer organizations and organized a total of **962** volunteer service activities.

Case: Youth volunteer service from Love Post warmed groups of “emerging businesses”

The Company organized youth volunteer service activities of Love Post for the China Tower battery exchange service, and made every effort to create “Love Post” for the China Tower battery exchange service, which could be used for “heating when you are cold, cooling when you are hot, fetching water when you are thirsty, and taking medicine when you are injured”. It provided guidance in ideology, assistance in work and care in life for industry groups of “emerging businesses”, such as staff in the parcel and food delivery. The Company created the brand of youth volunteer service with the China Tower characteristics, and effectively gave play to the pioneering and exemplary role of the Company’s young employees in serving the community and the masses and contributing to the society.



▲ Volunteers are caring for the riders



Case: Youth volunteers take the initiative to be the vanguard of emergency rescue and disaster relief

Focusing on the key works of production and operation, earthquake relief, flood control and epidemic prevention, and forest fire prevention closely, the Company has organized and established 25 youth commandos in Sichuan, leading the majority of young people to undertake communication security, hidden danger supervision and other urgent, difficult, dangerous and heavy tasks proactively. In the process of dealing with three earthquakes of magnitude 6.0 or greater and extreme high temperature weather, two comrades were awarded the honorary title of “Advanced Individual for Earthquake Relief in Lushan 6.1 Earthquake and Barkam 6.0 Earthquake Group (蘆山6.1級地震和馬爾康6.0級震群抗震救災先進個人)” by Sichuan Earthquake Relief Headquarters.



▲ The Company carried out various voluntary service activities in Sichuan





Governance

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Governance

I. Business ethics and anti-corruption

The Company attached great importance to compliance operations, intensified efforts in creating clean ecology, complied with the Provisions on the Anti-Money Laundering Law of the People's Republic of China, Anti-Unfair Competition Law of the People's Republic of China, Clean Practice of State-owned Enterprise Leaders, and other laws and regulations, abided by business ethics and compliance operations to protect the common rights and interests of both the Company and its stakeholders and promote the clean and healthy development of the Company.

The Company continued to improve internal supervision mechanism, and strengthened the construction of internal control system. On the basis of the three lines of defense, i.e., business supervision, audit supervision and disciplinary supervision, the Company has established a supervision committee composed of discipline inspection commission, auditing department, inspection department and other departments. The committee actively promoted the efficient implementation of each specialized supervision plan, and strengthened the supervision of handling and rectification of issues with major risks. At the same time, the Company formulated Measures for Evaluating the Supervision of Handling and Rectification of Issues 《督辦事項整改情況評價辦法》 and Measures for Evaluating the Completion of Supervision Plan 《監督計劃完成情況評價辦法》, and launched the 3.0 version of supervision system, supporting the supervision work with relevant systems and technology.

The Company continued to improve the handling work mechanism for disciplinary inspection-related petitions and reporting, established and enhanced a reporting and supervision system with multiple channels. Following the principle of "division of responsibilities by level with centralized management", the Company dealt with various kinds of petitions and reporting in a timely manner. At the same time, the Company strictly kept the personal particulars of the real-name complainant confidential, to firmly safeguard the rights of supervision and legitimate interests of employees.

The Company conducted thorough investigations for all contract employees who ran a business or operated an enterprise, arranged the employees' self-examination and reporting and randomly checked the reporting of the employees in key positions. Based on the self-examination and random check, the Company maintained records for the relevant employees who ran a business or operated an enterprise, included the relevant enterprises in the List of Companies Prohibited from Trading with the Company and requested the relevant cadres and employees to dispose their shares or resign from the part-time positions in such enterprises. At the same time, the Company issued the Requirements for Regulating the Employees' Acts to Run a Business or Operate an Enterprise (Trial) 《關於規範員工經商辦企業行為的規定(試行)》, to further specify the code of conduct for employees to run a business or operate an enterprise and promote the clean and healthy development of the Company.



On the external collaboration front, the Company insisted that the Integrity Assurance Contract must be signed when entering into a business contract with a supplier or partner. Disciplinary inspectors, as the supervisory party, are invited to witness and confirm the signing process of the contract between both parties to improve the transparency and fairness of procurement and external collaboration. In 2022, for 15 cooperative units that violated the provisions of the Integrity Assurance Contract or involved in the breach of discipline and regulations or even illegal acts, the Company took disciplinary measures such as public criticism and inclusion in a “black list”.

The Company continuously enhanced the employees’ integrity awareness by educational activities on business integrity. In 2022, the Company held the awareness building and educational conference for leaders at all levels and employees in key positions. Typical cases as warning to promote rectifications and governance were deeply analyzed at the conference. A total of 6,243 employees attended the conference. At the same time, the Company published the 2022 Supervision Plan of Specialized Departments in the Headquarters to specify 35 major matters to supervise, and 10 specialized departments organized the supervision and inspection, during which 74 categories of problems were found and 14 systems were improved. Reports were published to deeply disclose the risks and promote the effective governance. In addition, the Company regularly provided updates on the dynamics of integrity construction, promulgated holiday integrity reminders, held the case analysis conference and conducted anti-corruption training for new employees to cultivate and improve the integrity awareness of its employees.



▲ Business Integrity Warning and Education Conference



Governance

In 2022, the Company held two on-site training sessions for directors in January and October, respectively. The sessions covered various aspects such as listing compliance, anti-corruption and risk management and control. Directors and management of the Company participated in such trainings.

In 2022, the Company had a total of one concluded lawsuit regarding corrupt practices, and the relevant persons involved had been sent to judiciaries for proceedings in accordance with laws and regulations.

II. Risk management and internal control compliance

The Company continuously strengthened risk management and improved risk and internal control system and mechanism. Taking coordinating the comprehensive risk prevention and high-quality sustainable development as the goal, the Company intensified the efforts to establish a standardized risk prevention and control system, gave full play to the role of major risk evaluation, monitoring and forewarning and stepped up the supervision and evaluation efforts to effectively improve the Company's capabilities to operate in accordance with laws and regulations and resist risks.

In 2022, the Company identified, evaluated and responded to the internal and external risks to compile the 2022 Manual of Risk and Internal Control Management for the Company and all provincial subsidiaries. There were 42 additional control points and over 480 control measures were optimized and adjusted, to effectively prevent and eliminate risks. In addition, the Company organized units at all levels to conduct thorough self-evaluation over risk control and selected some units to conduct independent risk control evaluation, completed the first round of full and complete inspection for the whole Company within three years, which ensured the effectiveness of risk and internal control management for the Company. Meanwhile, the Company held the training sessions for risk and internal control management to implant the cooperate compliance culture and enhance the risk prevention awareness of all staff.



The 2022 Manual of Risk and Internal Control Management for the Company and all provincial subsidiaries added **42** control points, optimized and adjusted over **480** control measures.



III. Patent and brand protection

The Company attached great importance to the protection of intellectual property rights, fully implemented the Company's Measures for Implementation of Patent Management. It made vigorous efforts in patent application and rights protection, respected and protected achievements of its own technological innovation and continued to improve intelligent property rights management. To speed up the licensing for the Company's patent application and improve the quality and licensing rate of patents, the Company applied the eligible patents through preliminary review and preferential examination after studying the preliminary review, preferential examination and other policies for accelerating patent licensing in 2022. During this year, the Company published the Implementation Rules for External Collaboration on the Technology Innovative Research and Development Projects, to strictly regulate the ownership of intelligent property rights with regard to the ones arising from commissioned and collaborated R&D. At the same time, the Company respected for the intelligent property rights of others, specified the scope of using intelligent property rights in the procurement and cooperation related contracts or agreements, and used the relevant intelligent property rights strictly in accordance with the agreed scope. In 2022, the Company newly obtained 24 national invention patents and registered 45 software copyrights. As of the end of 2022, the Company obtained 61 national invention patents and registered 132 software copyrights on an accumulative basis.



As of the end of 2022, the Company obtained **61** national invention patents and registered **132** software copyrights on an accumulative basis.

The Company conducted publicity activities on regulatory compliance in accordance with the Advertising Law of the People's Republic of China, Trademark Law of the People's Republic of China and the regulations of relevant authorities such as the Ministry of Industry and Information Technology. The Company implemented the Identification System Manual to regulate the use of trademarks and brand images, supplemented by multi-channel external promotions and internal publicity activities so as to establish and enhance corporate brand image.



IV. Information security and privacy protection

Striving to implement the requirements under the laws and regulations related to network security such as the Cybersecurity Law, Data Security Law and Personal Information Protection Law of the PRC, the Company formulated the Network and Information Security Construction Plan of China Tower, which specified the construction goals and stage arrangements of “systematized and standardized security management, all-for-one and self-operable security technology, standardized and regular security operation”.

In terms of security management, in 2022, the Company further improved the network security working system as set out in the plan by publishing the management systems of China Tower, such as the Network Security Management Measures, Measures for Emergency Management of Network Security Incidents, Regulations on the Security Management of Data Sharing and its External Application and Processing, IT Server Room Management Measures and the Measures for Managing the User Accounts in the Information System to design the systems and restrict responsibilities in connection with, among others, the management over network security, data security and personal information security, and specified the implementation regulations at daily operation level, to further enhance information security awareness and system construction level.

In terms of security technology, the Company set up various information security inspection modules such as asset discovery, vulnerability scanning, automatic penetration testing, baseline evaluation, code scanning, phishing exercise, which greatly enhanced the global security monitoring capabilities. In addition, the Company developed network attack-blocking system, honeypot system, traffic analysis system and deploying host protection, tamper-proofing, Web application firewall, anti-virus software to comprehensively enhance the capacity of defense in depth for the IT platform with one-level architecture. Meanwhile, the Company continued to improve and optimize the network architecture, completed the preliminary construction of zero trust security defense system, launched and deployed the micro-segmentation tools and had the preliminary network monitoring capabilities for cloud-based application system and global security defense and protection capacity, which improved and intensified the network security capacity of the Company.



In terms of safe operation, the Company constantly strengthened the customer-oriented data security capabilities, regulated the compliance management of data security and protected customers' data security practically. The Company established the working system of regular vulnerability scanning and attack and defense exercise to scan vulnerabilities across the network quarterly in rotation, handle major network security incidents in a timely manner and implement a series of network security emergency response procedures; organize skill trainings on network security and universal education across China, nurture a group of network security professionals and comprehensively enhance the network security awareness of the employees. By the end of 2021, all the 2,315 network security risks investigated and identified were rectified by the Company. In 2022, the Company continued to have regular vulnerability scanning and identification of network security risk. The safe operation level of the network assets in the Company's IT system platform was significantly promoted and the capabilities to prevent and eliminate network security risks were enhanced significantly, which effectively protected the information system, important data and network security of the Company.

V. Guarantee for service quality

(I) Guarantee for operation and maintenance quality

In order to improve the operation and maintenance capacity and support its high-quality development, the Company empowers operation and maintenance work through innovative managerial practices and technical means with a focus on enhancing service capacity, station retention, and digital governance. During the year, the Company adhered to the concept of value creation and innovation, promoted the application of intelligence operation and maintenance functions, improved the level of lean management of station operations, improved production management efficiency, and prevented operational risks. The Company insisted on the problem and risk orientation, analyzed and studied production management problems carefully, and implemented a supervision linkage mechanism to further improve risk prevention and safety production capacity.



Governance

In 2022, the TSP business achieved a compliance rate of 99.9% in terms of power outage and network exit duration standard in different cities and operators and 100% compliance rate was achieved among 30 provinces except for Guangdong Province. An average service disruption caused by power failure reached 8.3 minutes/station/month in China, representing a year-on-year improvement of 6.7%; a service disruption ratio caused by power failure of 4.8%, representing a year-on-year improvement of 0.2 percentage point; there was a significant improvement in remediation of stations experiencing super-long and super-frequency network exit, representing a year-on-year improvement of 24.2% and 37.1%, respectively. In addition, the Company promoted the construction of the maintenance system for Energy business and Smart Tower business, improved the Management Measures for the Operation and Maintenance of Smart Tower Business and the Management Measures for the Operation and Maintenance of Energy Business, and formed the operating mechanism of “immediate acceptance”, “immediate delivery and maintenance” and “immediate on-lease”; with emphasis on the asset inventory, acceptance, delivery and maintenance of equipment and focus on emergency reporting and order handling, the comprehensive implementation of Energy business maintenance was realized, and the timely rate of fault handling of Energy business reached 99% in China.

(II) Improving customer service

The Company adhered to the philosophy of “being consistently client-focused, ongoing improvement of services while eliminating drawbacks, and improvement of client satisfaction”. The Company continued to implement the client service representative and dedicated customer service agent systems and implemented routinized communication mechanism both among the leaders and employees to ensure prompt response to client requests. Meanwhile, the Company focused on the difficulties and pain points of customers, strengthened in tough battle against site’s difficulties and enhanced the level of service. We will continue to deepen awareness of “companion service (陪伴式服務)” in Smart Tower business and rapidly respond to clients based on the customers’ business process. We have developed the ability of service operation and network security in multiple aspects and intensified efforts in creating service advantages of “high standard, rapid response, strong ability and super safety”.



In TSP business, the Company has continually improved the complaint processing mechanism, established multiple online and offline complaint filing channels, including “China Tower online service” WeChat official account, 10096 hotline, service meetings, maintenance meetings and other filing channels and communication mechanisms. The Company encouraged all branches to direct their customer complaints into online channel for centralized management, supervision, and evaluation. In order to further standardize the Company’s management on customer service compliant, the Company has developed and optimized a service upgrade process, from employees to leaders, local cities to headquarters, to ensure a satisfactory and closed-loop solution for every customer feedback. In 2022, the Company received 1,828 service complaints from our three TSP customers, which were filed on “China Tower online service” platform. The total number of service complaints decreased by 40.3% as compared with 2021, and the percentage of work orders that received customers’ satisfaction was 99%.

In Energy business, the Company established multiple online and offline complaint filing channels, including WeChat official account of “Tower Battery Exchange”, WeChat service account of “Tower Power Charging”, 10096 hotline, Tower Battery Exchange APP, Tower Power Charging APP, etc. The Company primarily served for individual customers, implemented the Management Measures of China Tower Energy Customer Service (for Trial Implementation), clarified the classification of energy customer complaints, handling principles and processing time, which were resolved by headquarters customer service staff or assigned to the front-line order receivers for handling. The Company established a regular working mechanism such as monthly customer service briefings, effectively tracked management of complaint process and visited customers for satisfaction in respect of complaints, and facilitated timely resolution of any issues. In 2022, with regard to the Energy business, a cumulative number of 1,538 complaints was received, which were mainly from battery exchange and battery charging business.

In Smart Tower business, the Company implemented the Customer Service Standard of Smart Tower Business, the Notice on Strengthening Customer Service Work of Smart Tower Business and other relevant documents, clarifying the principles, classifications and processes related to handling of complaints. As Smart Tower business mainly conduct business with corporate and government sectors, the Company carried on special initiatives for improving customer service. The account managers were required to accompany with customers in the whole process, promptly respond to client requests, regularly provide service reports to customers and convene service meetings. In 2022, the complaint channels of Smart Tower business were mainly received by the account managers of all branches in the course of daily companion service, assisted by calls from the customers of 10096 hotline or active visits, and the Company received 91 customer complaints throughout the year.



VI. Supply chain management

The Company was dedicated to building up a supplier management system to ensure win-win collaboration and orderly competition, strengthened the management of debt collection projects, optimized the supplier admission scheme, and implemented the post-assessment of suppliers to jointly create a healthy and sustainable business development model.

(I) Admission, assessment and elimination of suppliers

In order to standardize the management of suppliers and safeguard the interests of the Company, the Company strictly controlled the admission management of suppliers, paid close attention to the admission qualification audit on potential suppliers, formulated the “Regulations on Prohibiting Business Transactions with Enterprises Run by Specific Related Parties of Leaders and Employees in Key Positions”, and established the “List of Companies Prohibited from Trading” in a hierarchical manner.



Established the
**“List of
Companies
Prohibited
from Trading”**
in a hierarchical manner

Case: Unblock the repayment channels and implement supplier payment management

The Company put into practice the Notice on Unblocking the Complaint Channels for Repayment of Small and Medium-sized Enterprises and the Notice on Further Standardizing the Management of Bidding Deposit Collection and Return, unblocked the complaint channels for repayment and included repayment complaints in the Company’s normalized management, fully implemented the principle of “zero default without disagreement and quick settlement with disagreement” for payments due from suppliers, promoted proper resolution of complaints in a timely manner, and facilitated synergistic development between the Company and suppliers.



The Company continued to strengthen the post-evaluation management of suppliers and conducted post-evaluation on the execution effect of all extraction projects. During the performance stage, the Company conducted a multi-dimensional comprehensive evaluation on the actual situation of suppliers regularly; after the obligations are fulfilled, a comprehensive evaluation of suppliers will be conducted on hundred-mark system in aspect of technology, quality, delivery, service, cost and settlement, etc. The post-evaluation results are applied to subsequent purchase projects, and the actual share of suppliers is dynamically adjusted according to the post-evaluation results. In 2022, the Company conducted post-evaluation for important suppliers such as suppliers of centralized procurement projects and framework agreements, with 3,351 suppliers participating in the evaluation.

For the non-compliance suppliers in the database, the Company imposed appropriate penalties on them in accordance with the Measures for Negative Behavior Management of Suppliers of China Tower Corporation Limited (for Trial Implementation) and relevant contract agreements, and keep an eye on the protection of the rights and interests of their employees, safety and environmental protection management and integrity management of the suppliers. If there were the following situations among the above-mentioned suppliers, including "major safety problems with materials or services, such as fires in the computer room or the warehouse due to personal casualty accidents and not duly handled", "violating the provisions of the Integrity Assurance Contract", and "mass incidents or lawsuits resulted from arrears in workers' wages", the Company would include these suppliers in a blacklist for management.

By supplier's place of registration	Total number of suppliers in 2022
Mainland China	186,777
Hong Kong, Macau and Taiwan or overseas	38

(II) Green supply management

In order to drive the awareness of environmental protection and energy saving and the green supply capacity of the industrial chain, the Company attaches great importance to the awareness of environmental protection of the suppliers. Adhering to the result orientation and according to the characteristics of procurement objective, the Company also reasonably examined the requirements of environmental management system and energy-saving product certification system of suppliers, and encouraged suppliers to enhance their awareness and ability of ecological protection. In addition, the Company has enhanced the procurement of green products, improved the green level of the supply chain, and made contributions to the sustainable development of the upstream and downstream of the industrial chain with its own practices.

Case: New outdoor power supply procurement helps promote the integration of green concept into the procurement process

Based on a natural heat dissipation mode of operation and mainly equipped with the outdoor power supply equipment and the outdoor battery, the new outdoor power supply supporting equipment can achieve high overall conversion efficiency without the cabinet (box), the air conditioning temperature control and other facilities required by the traditional power supply supporting equipment, which is in line with the national development concept of green, low-carbon, energy saving and emission reduction, and can meet the needs of customers more economically and reasonably. It is the technical direction of the construction of subsequent base station. By the end of 2022, the Company has purchased a total of 12,000 sets of the new outdoor power supply and ancillary equipment across the country, including approximately 7,000 sets of the outdoor power supply supporting equipment and approximately 5,000 sets of the outdoor batteries.



Purchasing a total of **12,000** sets of the new outdoor power supply supporting equipment

(III) Digital management of supplies

In order to comprehensively form a new asset management model of “networking, platform-based and digital intelligence”, in 2022, the Company focused on the lean demand in the field of asset operation, carried out the pilot application of “one-code-for-all service”, established the one-thing-one-code mechanism from the source, assigned a unique code to equipment when it was purchased from the factory, running through the entire life cycle from procurement to asset formation, asset operation and asset retirement, and made supplies and assets trackable, traceable and monitorable throughout, thus effectively improving production efficiency and management accuracy.



Since the launch of “one-code-for-all service”, it greatly improved the efficiency of process execution in the four major areas of order whole-process management, inventory management, project whole-process management, and asset operation management. “one-code-for-all service” increased the execution efficiency from delivery to receipt by 66%; the time of supplies in storage was greatly shortened, and the efficiency of stock taking was increased by 66%; the time from delivery to installation was shortened by 61%, and the efficiency of completion confirmation was increased by 36%; the efficiency of inspection and acceptance was increased by 67%. At the same time, the difficulty of asset inventory operation was greatly reduced, and the inventory data was more reliable and accurate, ensuring that the data flow of resources and assets was consistent with the physical flow, and realizing dynamic tracking of asset operations. As of the end of 2022, the Company has assigned a total of 107,291 coded supplies, distributed in 41,250 projects and 20,143 sites, covering 82 types of subdivided assets. The completion of this work reduced the workload and human intervention in asset management, making the management process more efficient, inventory control more accurate, and risks more controllable.



▲ “one-code-for-all service” for supplies of the Company



Prospects for Sustainable Development

The Company will embark on a new journey with vigorous and determined endeavor. The year 2023 serves as the key connecting link for the implementation of the 14th Five-Year Plan, and promotion for high-quality development of the Company. China Tower will anchor on the development objectives of the 14th Five-Year Plan, continue to deepen the “One Core and Two Wings” strategy, and contribute to the implementation of the Cyberpower, Digital China and “dual carbon” strategies.

We will hold aloft the banner of sharing, adhere to the customer as the fundamental, service as the key, unswervingly scale up and optimise the sharing philosophy, continue to innovate the construction mode and service mode, forge core capabilities, fully meet the construction needs of telecom enterprises, accelerate the efficient scale deployment of 5G economy in collaboration with telecom enterprises, and fully support the implementation of the strategies of Cyberpower and Digital China. We will actively explore new businesses and areas, such as 5G virtual private networks, edge computing and network optimization, so as to transform “telecommunication shelters” into “data shelters” and support the development of computing networks in terms of infrastructure sharing, intelligent edge computing services and computing power sharing services, etc.

We will accelerate the building of “digital towers”, seize the opportunity of the development of the digital economy, fully leverage resource endowment characterized with “numerous and wide-spread site coverage, high-point monitoring capacities as well as complete supporting facilities (點多面廣、站高望遠、配套齊全)” and professional operational advantages, to integrate into the overall economic and social development, accelerate the transformation and upgrading of “telecommunication towers” to “digital towers”. We will focus on key industries and continue to dive deep with greater penetration, and continue to empower thousands of industries; the Company will focus on platform, algorithm, data, application and operation, to strengthen product innovation, enhance core competitiveness, and strive to be the leader in the IoT industry chain at the mid – and high-point.

We will specialize in the Energy business, focus on the three major business segments of new energy mobility services, power backup services and integrated energy services, and make great efforts on the high-quality development of nine businesses, including battery exchange, charging, power backup, power security, green energy, energy storage, energy conservation, electricity trading and demand-side response services, and strive to be the leader of new energy mobility, the provider of power backup services and the participant of integrated energy services, to build a new energy application service provider with core competitiveness, to actively serve the national economy and people’s livelihood and to take concrete actions to help achieve the goal of carbon peaking and carbon neutrality.

 Prospects for Sustainable Development

Facing the frontier of world science and technology, the main battlefield of digital economy, the requirements of the nation key development, the demand and production requirements of customers, we will strengthen innovation-driven development to promote intelligent operation and maintenance, edge computing network, video AI algorithm, security solutions, energy Internet and other key core technology research and development breakthrough, we will also enhance the independent controllability and original innovation capability in key areas, create competitive, vigorous, independent and controllable series of tower featured products and solutions, effectively improve the overall R&D and innovation capability and efficiency and effectiveness of the Company.

We will support the national economy and people's livelihoods, adhere to the "people-centered" development philosophy, continue to promote the universal access to mobile networks in remote areas, and promote a more balanced network layout in the eastern, central and western regions, to narrow the "Digital Divide", help achieve rural revitalization in various fields from technology, industry, consumption and talent, and fulfill our corporate social responsibility. We will deliver quality emergency communication guarantee work in case of major events and natural disasters to ensure a smooth communications, and make an all-out effort to safeguard people's lives and property. We care about the growth of employees, promote the initiatives of strengthening enterprises with talents, accelerate the implementation of the talent plan, constantly optimize the talent structure, and build a multi-channel, multi-level and multi-form training system to continuously stimulate new momentum for the Company's development.

Difficult as the task is, we will get the job done if we keep working at it; long as the journey is, we will reach our destination if we stay the course. In 2023, we will unswervingly promote high-quality development, create a new situation for development with high-quality operation, forge new development momentum with high-quality technology and product innovation, stimulate new vitality in the organization through high-quality reform, cultivate new competitive advantages with high-quality talents, and improve the effectiveness of development with high-quality management, to contribute to a good start in building a modern socialist country in all respects.

Demonstration of ESG Performance

Greenhouse gas emissions

Indicators	Unit	Data in 2022
Direct greenhouse gas emissions (Scope 1)	Ton	104,223.35
Gasoline	Ton	50,240.50
Diesel	Ton	15,767.48
Kerosene	Ton	0.00
Fuel oil	Ton	35.60
Coal	Ton	117.57
Coal gas	Ton	36.55
Natural gas	Ton	1,846.51
Liquefied petroleum gas	Ton	36,179.14
Indirect greenhouse gas emissions (Scope 2)	Ton	746,161.64
Externally sourced electricity	Ton	732,927.88
Externally sourced heat	Ton	13,233.76
Greenhouse gas emissions (Scope 1 & Scope 2)	Ton	850,384.99
Greenhouse gas emissions per unit of operating income	Tons/RMB million	9.23

Notes:

- As dictated by the types of businesses operated by the Company, greenhouse gas emissions are mainly from carbon dioxide generated by the use of externally sourced energy and fuel.
- The statistical scope of greenhouse gas emission data includes the headquarters, provincial branches and municipal branches of China Tower Corporation Limited.
- Greenhouse gas emission data is presented by carbon dioxide equivalent, calculated based on the 2019 Refinement to the IPCC 2006 Guidelines for National Greenhouse Gas Inventory published by the Intergovernmental Panel on Climate Change (IPCC), China Energy Statistical Yearbook 2012 published by the National Bureau of Statistics, the 2005 Study on China's Greenhouse Gas Inventory and Provincial Greenhouse Gas Inventory Guidelines (Trial) published by the National Development and Reform Commission, the Letter on soliciting Opinions on the Guidelines for Compiling Carbon Peaking Action Plans for Central Enterprises (draft for comment) issued by SASAC and Guidelines for Accounting and Reporting of Greenhouse Gas Emissions (Trial) published by the Ministry of Ecology and Environment.
- Due to the rapid development of the Company's Smart Tower business and Energy business, the externally sourced electricity increased during this year.



Use of energies and resources

Indicators	Unit	Data in 2022
Direct energy consumption	MW•h	423,545.62
Gasoline	MW•h	189,970.11
Diesel	MW•h	57,115.39
Kerosene	MW•h	0.00
Fuel oil	MW•h	130.49
Coal	MW•h	314.01
Coal gas	MW•h	201.78
Natural gas	MW•h	8,279.03
Liquefied petroleum gas	MW•h	167,534.81
Indirect energy consumption	MW•h	1,294,912.35
Externally sourced electricity	MW•h	1,261,493.77
Externally sourced heat	MW•h	33,418.58
Total energy consumption	MW•h	1,718,457.97
Energy consumption per unit of operating income	MW•h/RMB million	18.64
Water consumption	Ton	868,692.79
Surface water	Ton	8,122
Underground water	Ton	0.00
Tap water	Ton	853,845.63
Other	Ton	6,725.16
Water consumption per unit of operating income	Tons/RMB million	9.42

Notes:

- The statistical caliber of energy consumption is the consumption in offices and for operational purposes in all operating units of the Company.
- The statistical scope of energy consumption data includes the Headquarters, provincial branches and municipal branches of China Tower Corporation Limited.
- The energy consumption data is based on the consumption of electricity and fuel and the relevant conversion coefficient provided by the General Principles on Calculation of Comprehensive Energy Consumption (GB/T 2589-2020) published by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China and the Standardization Administration of the People's Republic of China for calculation.

Demonstration of ESG Performance

Waste emissions

Indicators	Unit	Data in 2022
Total hazardous waste	Ton	2,997.68
Discarded nickel-cadmium batteries	Ton	0.09
Discarded mercury oxide batteries	Ton	0
Discarded lead (acid) batteries (packs)	Ton	2,997.59
Hazardous waste per unit of operating income	Tons/RMB million	0.03
Total non-hazardous waste	Ton	4,999.40
Discarded air conditioners from the shelter	Ton	2,769.80
Waste switching power supply in the shelter	Ton	1,537.88
Office paper	Ton	678.26
Discarded electronic products	Ton	6.46
Office supplies consumption	Ton	7.00
Non-hazardous waste per unit of operating income	Tons/RMB million	0.05

Notes:

- As dictated by the types of businesses operated by the Company, the main hazardous wastes are lead (acid) batteries (packs) and nickel-cadmium batteries used in the shelters at the station sites. The weight of the batteries is estimated based on the equipment model.
- Regarding disposal and use of discarded batteries, the Company strictly complies with the Environmental Protection Law of the People's Republic of China 《中華人民共和國環境保護法》, Law of the People's Republic of China on the Prevention and Containment of Solid Waste Pollution 《中華人民共和國固體廢物污染環境防治法》 and the Technical Specifications of Pollution Control for Treatment of Waste Lead-acid Battery (HJ 519-2020) 《廢鉛蓄電池處理污染控制技術規範(HJ 519-2020)》 and other laws and regulations, and disposes of batteries accordingly.
- The main non-hazardous waste includes office paper, office supplies, electronic products and discarded air conditioners and switching power supply from the shelter.
- The statistical counts of discarded office paper and other office supplies include the data of purchase of paper, rollerball pens and paper clips by the Company's Headquarters, provincial branches and municipal branches, and the weight of such office supplies is estimated based on their models.
- Discarded electronic products include the scrapped desktops, laptops and printers from the Company's Headquarters, provincial branches and municipal branches and the weight of such supplies is estimated based on their models.
- As dictated by the types of businesses operated by the Company, it does not include use of packaging materials.



Employee hiring and turnover

Indicator		Unit	2022
Total headcount		person	21,906
Number of employees by nationality	Ethnic minorities	person	2,172
	Ethnic Han	person	19,734
Number of employees by gender	Male	person	15,940
	Female	person	5,966
Number of employees by category	Managers	person	4,071
	Non-managers	person	17,835
Number of employees by age	29 and below	person	5,188
	30-39	person	9,577
	40-49	person	5,841
	50 and above	person	1,300
Number of employees by region	East China	person	5,510
	Central China	person	2,513
	North China	person	3,407
	South China	person	2,248
	Northwest China	person	2,532
	Northeast China	person	1,887
	Southwest China	person	3,797
	Hong Kong, Macau and Taiwan	person	4
	Overseas regions (except Hong Kong, Macau and Taiwan)	person	8

Notes:

- The employee's statistic data for this year covers formal employees who entered into employment agreements with the Company.
- The employee turnover rates in each category = total number of employee turnover in the category/total headcount in the category.

Demonstration of ESG Performance

Indicator		Unit	2022
Employee overall turnover rate		%	1.4
Employee turnover rate by gender	Male	%	1.2
	Female	%	1.7
Employee turnover rate by age	29 and below	%	3.2
	30-39	%	1.1
	40-49	%	0.3
	50 and above	%	0.2
Employee turnover rate by region	East China	%	1.8
	Central China	%	0.7
	North China	%	1.3
	South China	%	2.1
	Northwest China	%	1.3
	Northeast China	%	0.7
	Southwest China	%	1.1
	Hong Kong, Macau and Taiwan	%	25.0
	Overseas regions (except Hong Kong, Macau and Taiwan)	%	0.0



Employee training

Indicators		Unit	Data
The number and percentage of employees trained by gender	Number of male employees trained	person	15,793
	Number of female employees trained	person	5,903
	Percentage of male employees trained	%	99.1
	Percentage of female employees trained	%	98.9
The number and percentage of employees trained by employee category	Number of managers trained	person	4,052
	Number of non-managers trained	person	17,644
	Percentage of managers trained	%	99.5
	Percentage of non-managers trained	%	98.9
The average training hours per employee by gender	Average training hours per male employee	hours/person	108.3
	Average training hours per female employee	hours/person	102.6
The average training hours by employee category	Average training hours of managers	hours/person	123.9
	Average training hours of non-managers	hours/person	102.8
The average training hours of all employees		hours/person	106.8

Employee work injury and fatality

Indicator		Data
Number of work-related fatalities	Number of work-related fatalities in 2020	1
	Number of work-related fatalities in 2021	1
	Number of work-related fatalities in 2022	0
Rate of work-related fatalities	Rate of work-related fatalities in 2020	0.005%
	Rate of work-related fatalities in 2021	0.005%
	Rate of work-related fatalities in 2022	0
Lost days due to work injury	Lost days due to work injury in 2022	1,303

Note:

- The employees' work-related fatality and injury data are subject to the official written documents such as the decision of the local social insurance administrative department on the acceptance of the application for work-related injury identification.

Appendix

HKEx “Environmental, Social and Governance Reporting Guide” – Index Table

Mandatory disclosure		Chapter disclosure
Governance Structure	<p>A statement from the board containing the following elements:</p> <ul style="list-style-type: none"> (i) a disclosure of the board’s oversight of ESG issues; (ii) the board’s ESG management approach and strategy, including the process used to evaluate, prioritise and manage material ESG-related issues (including risks to the issuer’s businesses); and (iii) how the board reviews progress made against ESG-related goals and targets with an explanation of how they relate to the issuer’s businesses 	Statement of the Board Consolidating the Foundation of Sustainable Development
Reporting Principles	A description of, or an explanation on, the application of the Reporting Principles in the preparation of the ESG report (Materiality, Quantitative and Consistency)	About the Report
Reporting Boundary	A narrative explaining the reporting boundaries of the ESG report and describing the process used to identify which entities or operations are included in the ESG report. If there is a change in the scope, the issuer should explain the difference and reason for the change	About the Report

“Comply or explain”

Aspect	KPIs	Chapter disclosure
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 relating to air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste.	Topic II – Empowering green and low-carbon development multi-dimensionally Firmly practicing green and low-carbon philosophy Vigorously advocating energy saving and environmental protection
	A1.1 The types of emissions and respective emissions data.	Demonstration of ESG Performance
	A1.2 Direct (Scope 1) and energy indirect (Scope 2) greenhouse gas emissions (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	Demonstration of ESG Performance
	A1.3 Total hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	Demonstration of ESG Performance
	A1.4 Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	Demonstration of ESG Performance
	A1.5 Description of emissions target(s) set and steps taken to achieve them.	Firmly practicing green and low-carbon philosophy
	A1.6 Description of how hazardous and non-hazardous wastes are handled, and a description of reduction target(s) set and steps taken to achieve them.	Vigorously advocating energy saving and environmental protection

Appendix 

"Comply or explain"		
Aspect	KPIs	Chapter disclosure
A2 Use of Resources	General Disclosure Policies on the efficient use of resources, including energy, water and other raw materials.	Firmly practicing green and low-carbon philosophy Vigorously advocating energy saving and environmental protection
	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).	Demonstration of ESG Performance
	A2.2 Water consumption in total and intensity (e.g. per unit of production volume, per facility).	Demonstration of ESG Performance
	A2.3 Description of energy use efficiency target(s) set and steps taken to achieve them.	Firmly practicing green and low-carbon philosophy Vigorously advocating energy saving and environmental protection
	A2.4 Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency target(s) set and steps taken to achieve them.	Vigorously advocating energy saving and environmental protection
	A2.5 Total packaging material used for finished products (in tonnes) and, if applicable, with reference to per unit produced.	As dictated by the types of businesses operated by the Company, it does not include packaging materials.



"Comply or explain"		
Aspect	KPIs	Chapter disclosure
A3 The Environment and Natural Resources	General Disclosure Policies on minimising the issuer’s significant impacts on the environment and natural resources.	Topic III – Developing a picturesque ecosystem by digitalization and intelligence Jointly constructing a green and beautiful ecology
	A3.1 Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	Topic III – Developing a picturesque ecosystem by digitalization and intelligence Jointly constructing a green and beautiful ecology
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.	Firmly practicing green and low-carbon philosophy
	A 4.1 Description of the significant climate-related issues which have impacted, and those which may impact, the issuer, and the actions taken to manage them.	Firmly practicing green and low-carbon philosophy



Appendix 

"Comply or explain"		
Aspect	KPIs	Chapter disclosure
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 relating to compensation and dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, anti-discrimination, and other benefits and welfare.	Caring for employees to achieve development
	B1.1 Total workforce by gender, employment type (for example, full- or part-time), age group and geographical region.	Demonstration of ESG Performance
	B1.2 Employee turnover rate by gender, age group and geographical region.	Demonstration of ESG Performance
B2 Health and Safety	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 providing a safe working environment and protecting employees from occupational hazards.	Caring for employees to achieve development
	B2.1 Number and rate of work-related fatalities occurred in each of the past three years including the reporting year.	Demonstration of ESG Performance
	B2.2 Lost days due to work injury.	Demonstration of ESG Performance
	B2.3 Description of occupational health and safety measures adopted, and how they are implemented and monitored.	Caring for employees to achieve development

"Comply or explain"		
Aspect	KPIs	Chapter disclosure
B3 Development and Training	General Disclosure Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities. <i>Note: Training refers to vocational training. It may include internal and external courses paid by the employer.</i>	Caring for employees to achieve development
	B3.1 The percentage of employees trained by gender and employee category (e.g. senior management, middle management).	Demonstration of ESG Performance
	B3.2 The average training hours completed per employee by gender and employee category.	Demonstration of ESG Performance
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.	Caring for employees to achieve development
	B4.1 Description of measures to review employment practices to avoid the child and forced labour.	Caring for employees to achieve development
	B4.2 Description of steps taken to eliminate such practices when discovered.	Caring for employees to achieve development

Appendix 

"Comply or explain"		
Aspect	KPIs	Chapter disclosure
B5 Supply Chain Management	General Disclosure Policies on managing environmental and social risks of the supply chain.	Supply chain management
	B5.1 Number of suppliers by geographical region.	Supply chain management
	B5.2 Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, and how they are implemented and monitored.	Supply chain management
	B5.3 Description of practices used to identify environmental and social risks along the supply chain, and how they are implemented and monitored.	Supply chain management
	B5.4 Description of practices used to promote environmentally preferable products and services when selecting suppliers, and how they are implemented and monitored.	Supply chain management



"Comply or explain"		
Aspect	KPIs	Chapter disclosure
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 relating to health and safety, advertising, labelling and privacy matters relating to products and services provided and methods of redress.	Patent and brand protection Information security and privacy protection Guarantee for service quality
	B6.1 Percentage of total products sold or shipped subject to recalls for safety and health reasons.	Based on the nature of the Company's business, it does not involve recycling for safety and health reasons.
	B6.2 Number of products and service related complaints received and how they are dealt with.	Guarantee for service quality
	B6.3 Description of practices relating to observing and protecting intellectual property rights.	Patent and brand protection
	B6.4 Description of quality assurance process and recall procedures.	Guarantee for service quality
	B6.5 Description of consumer data protection and privacy policies, and how they are implemented and monitored.	Information security and privacy protection



Appendix 

"Comply or explain"		
Aspect	KPIs	Chapter disclosure
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 relating to bribery, extortion, fraud and money laundering.	Business ethics and anti-corruption
	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.	Business ethics and anti-corruption
	B7.2 Description of preventive measures and whistle-blowing procedures, and how they are implemented and monitored.	Business ethics and anti-corruption
	B7.3 Description of anti-corruption training provided to directors and staff.	Business ethics and anti-corruption
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.	Topic I – Full implementation of the rural revitalization strategy Facilitating the improvement of public well-being
	B8.1 Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport).	Topic I – Full implementation of the rural revitalization strategy Facilitating the improvement of public well-being
	B8.2 Resources contributed (e.g. money or time) to the focus area.	Topic I – Full implementation of the rural revitalization strategy Facilitating the improvement of public well-being

Climate-Related Financial Disclosures (TCFD) Index Table

Issue	Issue description	Corresponding report location
Governance	Description of the Board's oversight of climate-related risks and opportunities.	Firmly practicing green and low-carbon philosophy – Governance
	Description of the role of management in assessing and managing climate-related risks and opportunities.	
Strategy	Description of the climate-related risks and opportunities identified by the organization in the short, medium and long term.	Firmly practicing green and low-carbon philosophy – Strategy
	Description of the impact of climate-related risks and opportunities on the organization's operations, strategy and financial planning.	
	Description of the resilience of the organization's strategies considering different climate-related conditions, including scenarios with temperatures of 2°C or lower.	–
Risk Management	Description of the organization's process for identifying and assessing climate-related risks.	Firmly practicing green and low-carbon philosophy – Risk management
	Description of the organization's process for managing climate-related risks.	
	Description of how processes of identifying, assessing and managing climate-related risks are integrated into the overall risk management of the organization.	

Appendix 

Issue	Issue description	Corresponding report location
Metrics and Targets	Disclose the indicators used by the organization to assess climate-related risks and opportunities according to its strategy and risk management process.	Firmly practicing green and low-carbon philosophy – Metrics and targets
	Disclose greenhouse gas (GHG) emissions and related risks of direct emissions (Scope 1), indirect emissions (Scope 2) and other indirect emissions (Scope 3), if required.	Demonstration of ESG Performance
	Description of the objectives used by the organization to manage climate-related risks and opportunities, and performance against targets.	Firmly practicing green and low-carbon philosophy – Metrics and targets





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