



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

(A joint stock company incorporated in the People's Republic of China with limited liability)

Stock Code : 0788

2019

Environmental, Social and Governance Report



About the Report



A Glance at the Report

This Report discloses the environmental, social and governance (“ESG”) performance of China Tower Corporation Limited (hereinafter referred to as “China Tower”, “Company”, “we” or “us” in this Report) in 2019. The Company compiled the Environmental, Social and Governance Report of China Tower Corporation Limited (this Report) 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”), with the aim of facilitating thorough communication and understanding between various stakeholders and the Company.

Scope of the Report

Organizations covered by this Report include the headquarters of China Tower Corporation Limited and its branches and holding subsidiaries. The range of data contained herein and the data calculation methods are specified in the Report.

Reporting Period

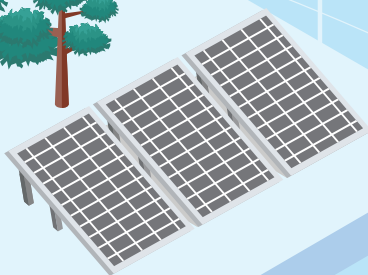
Unless otherwise stated, the reporting period is from 1 January 2019 to 31 December 2019.

Reference Guide

The content of this Report conforms to the “Comply or explain” provisions set out in Appendix 27 ESG Reporting Guide to the Listing Rules issued by the HKEx. An index is enclosed as an appendix to the report.

Confirmation and Approval

The report was approved by the Board of Directors on 18 March 2020.



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Chairman's Statement



The year 2019 marks the commercialization of 5G services in China, and the starting year for China Tower to further the implementation of the “One Core, Two Wings” strategy. The Company persists in adopting the philosophy of “committing to sharing, and serving the industry and society”. We deepened business transformation, and further adapted itself to national and socioeconomic development by actively promoting the sharing of telecommunication infrastructure, assisting in accelerating the roll-out of the 5G network, and proactively fulfilling environmental, social and governance responsibility. The Company has contributed greatly to the implementation of the Cyberpower, Digital China and Beautiful China strategies.

Tong Jilu

*Chairman of the Board
China Tower Corporation Limited*

Implementing the Cyberpower strategy and accelerating the commercialization of 5G.

As the main force in telecommunication infrastructure construction, we leveraged our competitive advantages in terms of large-scale construction, professional operations and resources coordination and sharing, to expedite the telecommunication infrastructure construction. As of the end of 2019, the tower construction projects has outnumbered the industry total over the past three decades, and the sites used by the three telecommunication operators had doubled. We facilitated the construction of the world's largest mobile broadband network in China, substantially increasing the depth and breadth of mobile networks, and rendered powerful underlying support to the development of digital economy and emerging industries. In line with our commitment to innovation-driven development, we expanded the investment in 5G innovation, overcame technical difficulties, and solved bottleneck problems of the high energy consumption of 5G and the sharing of the 5G DAS within a short time, thereby significantly contributing to the efficient deployment of the 5G network.

Strengthening the sharing and striving for value enhancement.

China Tower aims to promote and deepen sharing of resources, which is also our source of inspiration for value creation. Since its inception, the Company has always advocated the sharing philosophy and facilitated the two-way opening and sharing between "social tower" and "telecommunications tower". By "transforming telecommunications tower into social tower" and pushing forward strategic partnerships with enterprises and public institutions from the railway, power, postal, highway administration, traffic and real estate industries, we coordinated the use of tens of millions of social tower resources and public resources. Relying on about two million site resources and social public resources, we continued to deepen resource sharing. In 2019, we constructed and delivered a total of 161,000 5G base stations, more than 97% of which were constructed by transforming existing site resources, thereby saving substantial investment in this regard. Additionally, through "transforming telecommunications towers into social towers", we vigorously shared our own sites with the society, with more than 170,000 sites across China had cross-industry applications in the fields of environmental protection, meteorology, earthquake, traffic and satellite, etc. We proactively responded to the nation's call, explored the cascade utilisation of power batteries of electric vehicles in base stations, solved social challenges posed by disposal of decommissioned batteries, as well as explored energy socialization services, which helped drive the development of the low carbon economy, green economy and circular economy.

Chairman's Statement

Creating a favorable development environment, and promoting high-quality, efficient and economical business operations.

We strived to build a favorable policy environment to get the support from governments at all levels and administrative departments, in a bid to prompt the inclusion of telecommunications infrastructure in local planning and legislation, enabling the return of position of telecommunications infrastructure to be the same as that of water, electricity, gas and heating facilities. Thus far, 29 provinces nationwide have officially designated China Tower to be responsible for 5G network construction planning; 27 provinces have introduced local regulations on the construction and protection of telecommunications infrastructure; 861 counties have included the Company in their local planning committees; and 167 cities in 23 provinces have included the Company in their respective government affairs service centres. The Company is well-recognized by all sectors of society as the national team and main force in respect of the construction of telecommunications infrastructure. We firmly established a community of shared destiny of the industry by meeting the network coverage requirements with more shared sites in a more economical manner, and working with clients to reduce operating costs such as site leasing charges and electricity fee, which helped customers and the three telecommunication operators to enhance operating efficiency at lower costs.

Comprehensive fulfilment of corporate responsibility with development achievements given back the society.

We took initiative to perform our corporate social responsibility. We focused on old revolutionary base areas, areas with a high concentration of ethnic minorities and remote areas with relatively high incidences of poverty (hereinafter referred to as the "Poor and Remote Areas") in the construction of telecommunications infrastructure, and the sites built in rural areas and townships accounted for 65% of the total number of our newly built sites, greatly narrowing the "digital gap" among the Poor and Remote areas, western regions and developed regions. We were actively involved in major communication power security and various emergency rescue tasks such as typhoon, earthquake and flood relief operations; In particular, we undertook a total of 644 telecommunications infrastructure construction projects around Huoshenshan Hospital and Leishenshan Hospital for epidemic prevention and control in the recent fight against the COVID-19, offering secure and stable communication services connecting 28,000 base stations in high-priority areas, and showcasing the responsibility and role of China Tower. In response to the call of the Chinese government for "targeted poverty alleviation", we launched information, e-commerce and industrial poverty alleviation campaigns, efficiently improving the communication coverage and economic development in poverty-stricken areas.

Caring for employees under the people-oriented philosophy.

Upholding the people-oriented philosophy, we attach great importance to employee development, safeguard their rights and interests, protect their health and safety, and concern about their personal well-being. Under the talent-oriented corporate strategy, we intensified professional training and development, improved the service capability of the headquarters and provincial branches to support grassroots-level services, and optimised and developed frontline teams in counties while optimising the salary incentive mechanisms and strengthening the cohesion and centripetal force of the staff. We are fully committed to employee development, constantly boosting organisation vitality, and building a positive and harmonious working atmosphere, which in turn enhanced the cohesion of our employees to facilitate the development of the Company and share the development results with our employees.

2020 is a critical year for the implementation of the “One Core, Two Wings” strategy by the Company. We will step up promotion of the new development philosophy, seek faster synergistic development between the “One Core, Two Wings” strategy and the sharing philosophy, push ahead with the reform and innovation, enhance our core capability, and break new ground in high-quality development, while delivering value to the nation, the industry, the customers and the stakeholders, in an effort to attain sustainable and healthy development.



Tong Jilu
Chairman of the Board



Introduction to China Tower

Against the background of building China into a cyberpower, furthering reform in state-owned enterprises and fostering telecom infrastructure sharing, China Tower was jointly established by China Mobile Communications Corporation, China United Network Communications Limited, China Telecom Corporation Limited and China Reform Holdings Corporation Limited upon approval by the State Council and the SASAC as a major provider of telecom tower infrastructure services. The Company specialises in the construction, maintenance and operation of base stations and ancillary facilities, such as telecom tower, public network for major projects such as high-speed rail, subway and airport, as well as indoor network distribution systems of large industrial park and buildings.

Incorporated on 15 July 2014, China Tower is headquartered in Beijing. It has established 31 provincial branches and municipal branches across China, and has grown into the world's largest provider of telecom tower infrastructure services. The Company was listed on the main board of the Hong Kong Stock Exchange on 8 August 2018 (stock code: 0788.HK). As of the end of 2019, the total assets of the Company came in at RMB338.067 billion. The Company applies the "sharing" philosophy to guide its business operations, and furthers site sharing to accommodate diverse needs of customers. As of the end of 2019, the number of tower sites operated and managed by the Company has reached 1.994 million, covering 31 provinces, municipalities and autonomous regions nationwide. The number of tower tenants was 3.239 million, and the tenancy ratio of tower sites was 1.62. In 2019, the first year of 5G commercialization in China, the Company coordinated the construction of 5G infrastructure, and obtained 265,000 projects of 5G construction, of which 161,000 were delivered, and 97% were constructed by using existing resources, paving the way for effective 5G commercialization. In 2019, the public resources utilisation rate of the Company's new micro cells approximated 84% and new macro cells approximated 17%, indicating substantial savings of construction investment.



Introduction to China Tower

While honoring its commitment to collaborative construction and unified operation of mobile telecom infrastructure, the Company made more efforts to expand the sharing development, deliver value for the industry and society, offer returns to shareholders, and realise its sustainable development. In June 2019, the Company set up two wholly-owned subsidiaries, 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) to accelerate the strategic layout of “One Core, Two Wings”, with the tower and DAS businesses oriented toward the telecom industry serving as the “Core”, and the TSSAI (Trans-sector Site Application and Information) business and energy services oriented to private users functioning as the “Two Wings”, striving to build itself into an enterprise with the most potential for both growth and value creation among global peers.

Leveraging the Company’s telecom infrastructure resources and professional manpower all over China, Smart Tower Corporation Limited stepped up the transformation from “telecommunication towers” to “social towers”, focusing on emergency management, land, agriculture and forestry, ecology and environmental protection, transportation and oil, satellite positioning, edge computing and other sectors, and developed TSSAI business. Highly relying on the Company’s backup power assurance experience and professional maintenance capability, Energy Tower Corporation Limited mainly provides financial, transportation, medical, low-speed electric vehicle customers and general industrial and commercial users with power protection and energy services such as backup power/power generation, charging and replacement based on energy-efficient power batteries, and devoted to developing a nationwide company specialising in power security and energy services.



Introduction to China Tower

In addition, the Company also established Southeast Asia Tower Co., Ltd. in Laos in response to the “Belt and Road” initiative, providing more support to the construction of telecom infrastructure and helping promote the implementation of the co-location operating model in Laos.

In 2019, China Tower has received the following honours:



Introduction to China Tower



Management System of ESG

ESG Philosophy

Aspiring to become a world-class information and telecommunication infrastructure service provider, China Tower upholds the corporate core values – “Entrepreneurship and Innovation, Pragmatism and Efficiency, Benefiting Customer and Empowering Employees”, to effectively implement national strategies by stepping up efforts to build a “Cyberpower”, “Digital China” and “Smart Society”, promote telecom infrastructure sharing, and accelerate 5G commercialization.

We proactively fulfill environmental, social and strategy governance responsibilities and strive to integrate sustainable development concept into corporate strategy and business operation, strive to achieve the Sustainable Development Goals (SDGs) adopted by the United Nations, accelerate Telecom infrastructure construction in China’s least developed regions, significantly increase the popularity of communication networks and help network upgrades. We continuously take “sharing” as the core, reduce redundant construction and save resources, with the aim to lower the impact of the Company’s business activities on the environment, and achieve healthy and sustainable development of the industry and the Company as well.












ESG Governance Structure

The Company has established the ESG governance structure system that is in the charge of the Board of Directors, led by the senior management and conducted through coordination of all departments of the headquarters with joint efforts of employees at different levels. The Board of Directors is responsible for formulating ESG strategy and target; the senior management is responsible for developing ESG strategy and target implementation; the ESG Working Group consists of multiple departments of the headquarters is responsible for the daily work in respect of ESG of the Company; under the direction of the ESG Working Group, the branches at provincial level are responsible for the local ESG work implementation. The establishment of ESG management structure ensures various business risks in respect of environment and society can be properly managed, and the ESG philosophy and strategy can be effectively implemented.

Stakeholder Engagement and Materiality Analysis

The Company pays close attention to and actively responds to the demands of stakeholders. We identified our major stakeholders according to the features of our business operation and learnt about their main concerns on ESG through various communication channels. The major stakeholders we identified, key concerns and communication channels are shown in the table below.

Management System of ESG

Major stakeholders		Key concerns on ESG		Communication and response
Government and regulatory authorities		• Compliance with disciplines and laws		• Participating in meetings with government and regulatory authorities
		• Timely tax payment		• Disclosure of compliance reports
		• Legal compliance		• Relevant forum communication events
Shareholders and investors		• Financial performances		• General meetings
		• Legal compliance		• Annual reports and announcements
		• Transparent governance		• Investor meetings
Customers		• Customer service		• Dedicated customer managers
		• Project maintenance		• 10096 service hotline
		• Customer complaint		• Customer complaint mechanism
		• Privacy protection		• WeChat Official Account
Employees		• Employee interests and benefits		• Employee representative meetings
		• Remuneration system		• Staff activities
		• Labor standards		• Staff training
		• Training and development		• Performance appraisal system
Community		• Healthy and safety		• Staff appeal system
		• Social poverty alleviation		• Targeted poverty alleviation
		• Public welfare		• Volunteer activities
Suppliers		• Transparent purchasing		• Purchasing
		• Equal competition		• Supplier evaluation
		• Business ethics		• Supplier portal websites
		• Win-win and mutual benefit		• Supplier hotlines

In 2019, the Company continued to communicate with stakeholders to learn about their opinions and suggestions on ESG-related and other matters. In light of China Tower's strategy and business focus, the Company performed materiality analysis on 11 issues that are listed in the "ESG Reporting Guide", and identified the major topics for discussion in the year, which are "Product Responsibility", "Use of Resources", "Health and Safety", "The Environment and Natural Resources" and "Employment". Relevant topics include "Emissions", "Development and Training", "Labour Standards", "Supply Chain Management", "Anti-corruption" and "Community Investment". All topics would be discussed individually in this Report.

Building a Cyberpower through Sharing and Win-win Cooperation

Industry-wide Sharing of Resources, and Effective Implementation of the “Cyberpower” Strategy

Serving Digital Economy with Cross-sector Resource Sharing

Promoting Green Economy through Effective Energy Management



Building a Cyberpower through Sharing and Win-win Cooperation

Industry-wide Sharing of Resources, and Effective Implementation of the “Cyberpower” Strategy

Sustainable Development Strategy of China Tower

The telecommunication infrastructure construction is fundamental to practicing the “Cyberpower” and “Digital China” strategies and promoting national economic and social information development. The Company, adapting itself to the “sharing economy” and “digital economy” campaigns, deepened the sharing philosophy, firmly established the idea of “avoiding new construction projects if existing ones can be shared, and avoiding self-contained construction if joint construction is possible”, and continued to extend the connotation and coverage of sharing to deliver benefit and value to the industry and society with low-cost, high-efficient and good-quality telecommunication infrastructure constructions and services.

Actions Taken by China Tower in 2019

Deepening industry resource-sharing, reducing redundant constructions and waste of resources in the telecommunications industry

- Over 80% of new service provider tenants practiced sharing, and the tenancy ratio for tower sites recorded 1.62.
- Tens of millions of social tower resources were reserved, including approximately 7.4 million lamp towers, 3.5 million power towers, and 1 million surveillance towers. The social resources utilisation rate of new micro cells was c. 84%, and that of new macro cells was c. 17%.
- The Company reduced redundant construction of base stations and raised the resource utilisation rate by upgrading existing stations and innovating construction models, thus making 5G network construction more efficient and cost-effective. A total of 265,000 5G programs were planned in 2019, of which 161,000 had been delivered with 97% constructed using existing resources.



Building a Cyberpower through Sharing and Win-win Cooperation

Throughout the five years since its foundation, the Company, cooperating with three underlying telecommunications carriers, has played an active role in building the world's largest 4G network in China, and bolstered balanced development of the industry, narrowing the "digital gap" between the western regions, Poor and Remote areas with the developed regions in China. During the process of telecommunications infrastructure construction, the Company deepened industry resource-sharing, unified existing and social resources planning, and reduced redundant telecommunication constructions. As of the end of 2019, the tenancy ratio of tower sites increased from 1.55 in late 2018 to 1.62, resulting in significant economic and social benefits.

As regards the demand for new sites in terms of both the coverage of 4G networks and construction of 5G networks, the Company has made full use of existing infrastructure and social resources. On such basis, we continue to make innovations in the construction model, meet the network construction needs with low cost and high efficiency, and expand sharing ratio of sites.

Sharing of Social Resources

The Company has taken full advantage of social resources to fulfill the needs of telecommunications network construction, including power transmission towers, railway telecommunication infrastructure and a diverse range of social pole resources, such as lamp poles, surveillance poles, traffic signs and billboards. Over 80% of new micro cells were built on the basis of social resources, reducing redundant constructions and the waste of resources, and effectively cutting investment and construction costs.

Stepping up strategic cooperation with China Railway

The Company continued to strengthen cooperation with the China Railway to advance the telecommunication infrastructure construction along railway lines. Through synchronised planning, design, construction and opening, the Company has been committed to building excellent projects to optimise railway public network coverage characterised by higher efficiency, lower costs and better services. As of the end of 2019, more than 10,000 towers, 70,000 kilometres of pipelines and electric power resources along 131,000-kilometres of railways have been put into use, and the mobile communication network has covered a High-Speed Railway (HSR) mileage of more than 18,000 kilometres.

In the Beijing-Zhangjiakou HSR project, the Company achieved resources sharing in terms of tunnels, bridges, sites, towers and power, significantly reducing the construction cost. By effectively using the four towers, 32 box-type transformers, 94 equipment caverns and 48KM weak-current electric channels, the Company completed the telecommunications network coverage, and established only 1 macro cell, beefing up resources utilisation.



▲ Using railway telecommunication tower for signal coverage

Building a Cyberpower through Sharing and Win-win Cooperation

Promoting 5G network construction in metro lines

With six stations and twelve 2/3/4G systems, measuring 10.94 kilometres in total length, Chengdu Metro Line 10 (Phase I) serves as a major transportation hub connecting Chengdu Shuangliu Airport to Chengdu Urban areas. China Tower completed its 5G network transformation with mobile 2.6G frequency band in only 1 month, making it the first 5G metro line opened to traffic in China.



▲ 5G network DAS coverage in Chengdu Metro Line 10

Sharing power towers to avoid redundant construction

In 2018, the Company entered into strategic cooperation agreements with State Grid and China Southern Power Grid to facilitate the sharing of power towers and communication towers across the country. We continued to promote cooperation with the two grid operators, effectively saving land resources and eliminating redundant constructions. Taking Jiangsu province for example, Jiangsu branch concluded a strategic cooperation agreement with State Grid Jiangsu Electric Power Co., Ltd. in May 2018, creating conditions for resources sharing and cooperation for both sides. As of the end of 2019, Jiangsu Branch shared more than 300 power poles and towers in Jiangsu, solved difficulties at around 150 sites, substantially shortened its construction cycle and effectively reduced industrial investments.



▲ Using power tower to mount mobile network antennas

Building a Cyberpower through Sharing and Win-win Cooperation

Innovating construction models

The Company proactively innovates existing construction service models and deploys existing and social resources in an all-round way based on customer needs. On the basis of highly innovative service models that integrate macro and micro cells, coordinate indoor and outdoor network infrastructure facilities, and features mobile network coverage solutions, the Company provides diversified solutions and more comprehensive infrastructure services for network coverage and effectively addresses difficult problems in sites to satisfy the needs of low-cost and differentiated mobile communication network coverage.

For large venues characterised by exceptionally high traffic volume and multiple functional sections, the Company adopts a solution that combines active and passive networks and sets up a centralised equipment room to facilitate the sharing of auxiliary power products. For crowded areas, an active network is provided; for office areas, the traditional passive distribution system is made available for sharing between multiple carriers; for open spaces such as underground parking lots, the wide-angle radiation leaky coaxial cable is selected to further reduce costs and 3.5G frequency band is supported. Innovative fast connectors are installed to meet the intermodulation needs of multiple carriers during sharing, avoid interference and improve services. For the surrounding areas, suppressed spotlight antennas are deployed to ensure seamless coverage on the grounds around the venue. In the meantime, no towers or fewer macro cells are built, making the surroundings more harmonious.



▲ Diagram of DAS coverage program for Shijiazhuang International Convention Center

Building a Cyberpower through Sharing and Win-win Cooperation

Solution to mobile network coverage for Daxing International Airport

The Company undertook the construction of mobile telecommunications infrastructure in Beijing Daxing International Airport. Fully utilising the existing resources of high-pole lamps, boarding bridges, centralised power distribution, and pipelines at the airport, the Company employed the cutting-edge indoor coverage technique and the combination of small and macro cells for outdoors to achieve full coverage of the airfield areas, fulfilling the signal coverage requirements for the public network and government communications at Daxing International Airport. In addition, the Company built small and micro cells using the 93 high-pole lamps and building in the airport's airfield, applied new indoor coverage technology in terminals to support high-quality signal coverage for telecommunication carriers, and completed construction of 95 macro cells at important roads around the airport, including 94 shared cells, significantly reducing investment.



▲ DAS coverage at check-in areas



▲ Telecommunications coverage at check-in-island

Building a Cyberpower through Sharing and Win-win Cooperation

Network coverage sharing solution specially developed for multiple carriers at 2019 Beijing International Horticultural Exhibition

To guarantee effective telecommunications network coverage at 2019 Beijing International Horticultural Exhibition, the Company made the utmost of the social towers (smart lamp holes and buildings in the park), social electricity (street lamp box-type transformer), and public pipelines (pipelines in the park), arranged the indoor distribution system for wire communication transmission of five carriers, namely China Mobile, China Unicom, China Telecom, Capitel and ZhenGTong, and combined micro with macro cells and indoor with outdoor network infrastructure facilities, satisfying customers' coverage requirements with high quality, high efficiency and low cost.



▲ Overall arrangement of indoor distribution system



▲ Shared by multiple carriers to meet coverage needs

Building a Cyberpower through Sharing and Win-win Cooperation

Integrated solution for Grape Valley, Turpan, Xinjiang

Turpan Grape Valley is a popular 5A scenic spot in Xinjiang, and attracts an average of 20,000 visitors per day during peak tourist seasons. As the existing base stations around the Grape Valley scenic spot were located at the top of both sides of the valley, and the local landform is highly complicated, the communications network signal was poor in some areas, adversely affecting user satisfaction experience. Adopting the integrated solution of “combination of macro and micro cells” as well as sites at high and low locations, that features the model of “unified optical fiber transmission + unified centralised equipment room + fewer macro cells + micro cells for blind area coverage”, the Company reached the fundamental objective of 4G deep coverage and combination with the cutting-edge 5G technique within the short space of 25 days, and achieved low construction cost, short duration and good coverage effect.

In this project, the Company built five macro cells in total that were seamlessly integrated with the environment, shared one high-voltage power tower by leveraging its resource strength, and also planned 21 micro cells for accurate signal coverage. The Company constructed one new node equipment room and macro cell equipment room, and laid electrical and optical cables along walls of the valley for centralised transmission and power supply, improving the construction efficiency and cutting the construction cost.



▲ Existing poles and towers in Grape Valley

Building a Cyberpower through Sharing and Win-win Cooperation

Integrated solution for Xi'an Western Innovation Port

The Innovation Port Phase-I Project is designed as a research and education complex consisting of 51 buildings, measuring 14 hectares in land area with a floor area of approximately 2.08 million square metres. The Company changed the traditional tower construction method to combinations of micro and macro cells, indoor and outdoor network infrastructure, high and low locations, as well as new and traditional technologies, achieving the whole network co-location, sharing and coverage for three carriers. Through consultation and negotiations with the port authorities, we secured “three exemptions and one restriction” (exemptions from site rents, pipeline occupation fees, coordination fees for mobilization, and restriction on electricity charges), resulting in reductions in construction and operation costs.



▲ Western Innovation Port Park

Rapid 5G Deployment at Low Cost

5G network construction has been in full swing across China since 2019 when the first commercial 5G license was issued. In response to the characteristics and difficulties in 5G construction, such as high frequency, intensive sites, large power consumption and great investment, the Company effectively minimized redundant construction leveraging resources planning strengths and tapped into existing site resources. Of the 5G sites completed in 2019, 97% were renovated with existing resources, effectively contributing to the rapid, cost-effective 5G construction.

Building a Cyberpower through Sharing and Win-win Cooperation

5G network construction in Wuhan

In October 2019, the seventh Military World Games were held in Wuhan, Hubei Province. As the largest-scale and most influential sports meeting with the largest number of participants in the history of the Military World Games, the event was attended by almost 10,000 service men from 110 countries.

Utilising existing or social sites, Hubei branch efficiently completed the 5G signal coverage to 35 venues and related transportation hubs and main roads around for the Military World Games, helping to create the first “5G Military World Games”. For the 5G signal coverage to the “five bridges and one line” (five river-spanning bridges and one second ring express way), Hubei branch succeeded in securing government support to promote the sharing of municipal infrastructure resources. By integrating the 5G construction with the public infrastructure, and following the principle of coverage, safety and beauty, the Company discussed and developed technical standards for smart poles and towers of “five bridges and one line” and shared social poles and towers, electricity, pipelines and bridge decks for the construction of site facilities. As a result, the difficulty of mobile network coverage was surmounted, and the harmonization among base stations, decks and the road environment was achieved. In terms of the 5G construction for “five bridges and one line”, a total of 360 lamp poles and more than 60-kilometre of public pipelines were used, and support was given for customers to build 120 5G base stations, reaching full coverage of 5G signals. Compared with the traditional construction model, of the number of towers built was reduced by 100, slashing the total investment cost by about RMB30 million, as well as substantially shortening the construction period.



▲ DAS network equipment for the Military World Games



▲ Construction site of river-spanning bridges

Building a Cyberpower through Sharing and Win-win Cooperation

Serving Digital Economy with Cross-sector Resource Sharing

Sustainable Development Strategy of China Tower

In line with the development requirements of “Cyber Power”, “Digital China”, “Big Data” and “5G Network”, the Company has been actively expanding trans-sector resource-sharing and making full use of the existing site, shelter, maintenance resources, 7x24 hour continuous power assurance, FSU monitoring capability and other advantages to fully expand multi-industry cooperation in multiple fields. In terms of video monitoring, edge computing, power & environment monitoring output, information and data collection, smart community, etc., the Company has fully used its advantage of large-scale resource sharing and coordination to promote the building and development of digital economy and information technology.

Actions Taken by China Tower in 2019

Promoted trans-sector resource-sharing and expanded our business from offering site services to the provision of comprehensive information services

- Established wholly owned subsidiary Smart Tower Corporation Limited
- Focused on such fields as ecology and environmental protection, land and agriculture and forestry, emergency response, transportation and satellite positioning to promote TSSAI business
- Used more than 170,000 sites for multi-industry applications involving environmental protection, meteorology, earthquake, transportation, satellite, etc.



Building a Cyberpower through Sharing and Win-win Cooperation

Building on its resource strengths and in line with the requirements of building and development of a digital economy and a smart society, the Company proactively expanded sharing by the whole society, promoted the bidirectional conversion between “telecommunication towers” and “social tower”, provided customers with TSSAI business centring on resource sharing, in an effort to promote the development of the digital economy and information technology. Centring around our three major business brands, namely “smart sharing, smart connection, smart monitoring”, the Company expanded its cross-sector services while focusing on emergency management, ecology and environmental protection, land, agriculture and forestry, transportation and petroleum, satellite positioning, Internet and other key areas. By advancing programs that serve the national economy and people’s livelihood, for instance the monitoring of stalk burning, land, forest fire as well as, early warning for fires and grid-based air monitoring, the Company enhanced of the ability of customers in the industry to utilise information, data and smart technologies, and contributed to augmenting the popularity of IT service in the industry and improvement of public services. While creating value for various industries, the Company also created value for itself.

Ecology and Environmental Protection

Grid-based atmospheric monitoring



The grid-based monitoring projects implemented by the Company in provinces such as Sichuan, Shaanxi, Anhui, Shandong, divided areas under state and provincial control into 3km×3km grids. Installed on the towers in each grid, air quality monitoring equipment monitors the concentration of all kinds of pollutants in real time and traces the sources of pollutants with the support of big data algorithms and functions such as pollution pathway and positioning of pollution source, as well as real-time management and efficient closed-loop supervision of the ecological environment without any blind spot.



▲ Air quality monitoring equipment installed on tower poles

Building a Cyberpower through Sharing and Win-win Cooperation

Straw burning monitoring



With its unique high-altitude equipment, the Company replaced the previous ways of arranging for someone to keep an eye on people and land, monitoring at fixed locations and vehicle patrol with infrared thermal imaging alarm + AI smart analysis throughout Tianjin and Hebei. Smart fire detection service enables real-time warning and notifications of straw burning, which facilitates on-site evidence collection and processing by management personnel and allows all-weather, seamless monitoring in key areas. The Company offered straw burning monitoring services to more than 20 provinces, cities and regions, including Anhui, Heilongjiang and Shaanxi, to assist local governments with pollution control.



▲ High-definition monitoring equipment installed on tower poles

Protection of water source



In the Water Source Conservation Area of Zhangye, Gansu province, the Company successfully transmitted back data of high-definition videos, achieved real-time monitoring of the whole Water Source Conservation Area, timely acquisition of information on the overall water environment as well as supervision of the routes of sailing ships through installing binocular thermal imaging monitoring equipment at both high and low spots along with the use of 5G technology; meanwhile, through thermal imaging technology, the Company is able to supervise sewage discharge by passing ships in real time.



▲ Binocular thermal imaging monitoring equipment placed on towers

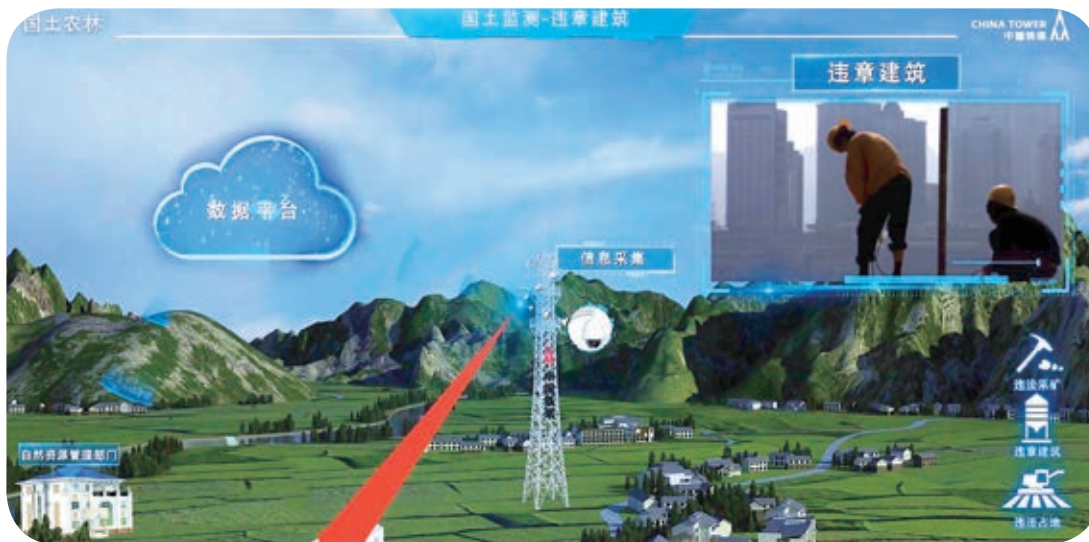
Building a Cyberpower through Sharing and Win-win Cooperation

Land, Agriculture and Forestry

Smart monitoring on land



Shaanxi branch communicated vigorously with the land administration authority. Based on its site resources, it matched its existing site resources with the needs for land monitoring, and actively carried out site selection, site construction, site transformation, equipment installation, etc. for land monitoring in pilot areas of Baqiao District and Chang'an District of Xi'an. In addition, it enabled the pilot project to be a key project promoted by the Department of Land and Resources of Shaanxi Province. For land monitoring projects, the Company used site to provide a reliable, stable and safe environment for land resource monitoring, and enabled full-coverage, all-day and all-weather monitoring; at the same time, the Company reduced the cost of system implementation, and contributed to smart monitoring and improvement in the management of land.



▲ Schematic diagram of smart land monitoring

Building a Cyberpower through Sharing and Win-win Cooperation

Forest fire preventing and monitoring



Chengde branch chose the communications tower in Xinglong County and Fengning County and established an effective system for forest fire prevention, which, through traditional video monitoring, enables real-time smooth online access to video thermal images and critical measurement of temperatures, automatically tracks the highest temperature in the region and that on the screen, and sends warning persons on duty in real time. With the “tower + link” model, Chengde branch completed the building of a pilot zone in respect of forest fire prevention, and, by harnessing its abundant site, turned “telecommunication towers” into “towers for forest fire monitoring”, it helped the forestry administration authorities with the monitoring of network building, effectively protected forests, strengthened information management for forest fire prevention, and improved the overall forestry administration and service capability.



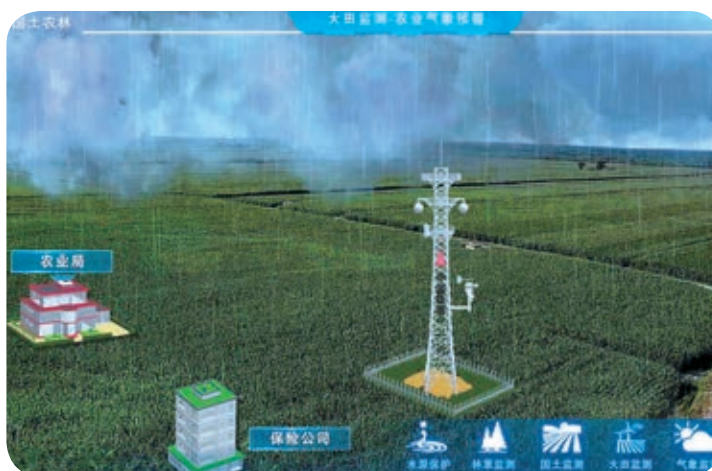
▲ Forest fire preventing and monitoring

Building a Cyberpower through Sharing and Win-win Cooperation

Farmland monitoring



In Jilin province, the Company built an integrated “sky-air-land” farmland monitoring network utilising digital technology, an effort which enables early meteorological warning for farmland, the monitoring of soil moisture and crop growth as well as agricultural disaster investigation, thus effecting the change from “weather-dependent agriculture” to “precision agriculture”. The high-altitude monitoring cameras mounted on the towers, assisted with satellite cloud images, can accurately locate the affected farmlands and, at the same time, generate disaster data to facilitate insurance companies’ claim settlement.



▲ Schematic diagram of farmland monitoring

Meteorological monitoring



Joining hands with the meteorological bureau, the Company forged a triangle monitoring network based on shared towers and a high-precision regional meteorological monitoring network in Shanghai, through which, it could obtain high-resolution images showing three-dimensional distribution of typhoon precipitation echo and wind field information, deliver accurate early warnings of typhoon, lightning, dense fog and other severe weathers, and provide effective means for all-round three-dimensional meteorological monitoring.



▲ Schematic diagram of meteorological monitoring

Building a Cyberpower through Sharing and Win-win Cooperation

Transportation and Petroleum

Integrated information system for highway monitoring



In cooperation with the traffic police of Luoyang City, Henan branch takes advantage of its site resource to provide solutions for video monitoring platform, places on towers to mount equipment, power supply, daily maintenance and the like. With its sites along the highways and at the highway exits as the core, the Company provided 8 monitoring points for the highway traffic police and 12 monitoring points for other traffic police forces. Through the integration of public resources from tourism, highway traffic police, traffic broadcasting companies and meteorological units, the Company developed a smart and comprehensive information platform for emergency command, which not only provided convenient services for citizens and tourists, but also improved the government's emergency management capability by setting up a smart highway traffic information network. After being put into use, the system effectively reduced the highway traffic accident rate, hence being highly spoken of by local government authorities.



▲ Provision of monitoring points

Building a Cyberpower through Sharing and Win-win Cooperation

Smart monitoring and pre-warning in high consequence areas

In Tianjin, Liaoning, Shaanxi, Gansu, Sichuan and other places, the Company used the tower resources in such key areas, especially areas near pipelines, to install infrared night vision cameras for 24-hour video monitoring. Based on the pictures taken by cameras in real time on site, analysis was performed using artificial intelligence. After discovering signs of excavation, heavy vehicle lingering, compaction, person lingering or the like, photos would be taken and videos would be recorded. Consequently, the Company would call the police, give instructions in a timely manner, handle the matter on site, and effectively prevent major risks resulting from oil and gas leakage in such areas.



▲ Infrared night vision cameras installed on towers

Building a Cyberpower through Sharing and Win-win Cooperation

Emergency Management

Earthquake monitoring



Together with China Earthquake Networks Center, the Company has built more than 10,000 point locations for quick reporting of earthquake intensity. The towers, shelters, stable power supply and high-quality FSU IoT are used to enable timely detection and real-time early warning of earthquake monitoring signals.

Earthquake intensity data are sent back to the business platform for real-time processing and analysis. When the processing and analysis results indicate possible occurrence of a disaster, a warning will be sent to the command and dispatch center, which can issue timely a disaster warning and, as necessary, coordinate resources for earthquake relief so as to minimize losses of life and property while gaining time for people to avoid danger.



▲ Deploying earthquake monitoring devices using towers and shelters

Fire warning in urban areas



As of now, in small commodity wholesale markets, kindergartens, hospitals, antique markets, “nine types of small places” and other densely populated places in 119 cities of 24 provinces, the Company has deployed IoT collection devices based on its tower resources, and accomplished front-end perception of high-risk parts by installing smoke, electrical fire, combustible gas and other wireless sensors.



▲ IoT collection equipment placed on towers

Building a Cyberpower through Sharing and Win-win Cooperation

Monitoring of hazardous industrial parks for production of chemicals

In Shandong Jinan Industrial Park for Production of Chemicals, the Company mounted panoramic AR cameras, thermal imaging pan-and-tilt cameras and some other equipment for high-altitude observation and monitoring; in the meanwhile, the Company connected such equipments to low-altitude monitoring equipment, and sent monitoring data generated by sensors previously installed in the park, to create an “panoramic AR picture” which provided visualised means for park supervision, supported decision-making for early warning, in-event command and after-event review, greatly enhanced the ability to prevent and eliminate security risks and supervision, and provided information services for eliminating risks associated with “high consequence areas”.



▲ Schematic diagram of monitoring of hazardous industrial parks for production of chemicals

Building a Cyberpower through Sharing and Win-win Cooperation

Promoting Green Economy through Effective Energy Management Sustainable Development Strategy of China Tower

Adhering to the philosophies of sharing and co-development, and relying on the strengths of its site, properties, ability to guarantee power supply to base stations, experience in power battery operation with visualised, manageable and controllable monitoring platform, the Company provides the public with diversified energy services such as backup power supply, power generation, battery charging and battery replacement, hence contributing to the sustainable development of the energy economy.

Actions Taken by China Tower in 2019

Promoted expansion of the energy business and actively explored a broader range of energy services

- Established Energy Tower Corporation Limited, a wholly-owned subsidiary
- Provided backup power supply service for financial outlets, medical institutions, schools, etc. in many places
- Built charging piles for low-speed electric vehicles in residential quarters and factory areas to provide safe and standardized charging services, solve charging problems and eliminate serious hidden hazards
- Provided convenient battery replacement service for the food delivery and logistics industries by building battery replacement stations
- Explored the recyclable use of batteries by replacing traditional lead-acid storage batteries with upgraded retired batteries for new energy vehicles to fully satisfy the need of backup power supply of base stations with a view to reducing environmental pollution



Building a Cyberpower through Sharing and Win-win Cooperation

The deepening of the new power system reform has created new business opportunities for energy operation, indicating vast space for socialised operation of energy in China. The Company will always adhere to the principle of sharing and coordination, and, based on its sites' ability in guaranteeing power supply and providing backup power supply service, it will give full play to its sites, property management services, construction and maintenance capability, visualised, manageable and controllable monitoring platform and other resources, capabilities and advantages to provide the public with diversified energy services such as backup power supply, power generation, battery charging and battery replacement.

Backup Power Supply and Power Penetration Services:

Based on its stable power supply assurance solutions for telecom base stations, the backup power supply and power generation services focus on postal logistics, finance and securities, medicine and health, government agencies, educational institutions, petrochemical, public transportation and other key industries, and provide customers in need of uninterrupted power supply with comprehensive "backup power supply + power generation + maintenance + monitoring" 7x24 hour power supply solutions.

Energy backup power supply service

On the strength of its experience in backup power supply and power assurance to telecom base stations, professional maintenance system covering all urban and rural areas and visualised, manageable and controllable smart monitoring system, Shanxi Branch provided integrated "backup power supply + monitoring + power generation" power assurance services for the informatization-related electrical facilities of organizations in the finance, medicine and health industries, government authorities, etc.

In 11 cities of the whole province, Shanxi Branch took the lead in providing entrusted "backup power supply + monitoring + power generation" power assurance service packages to nearly 1,000 "postal + savings" business outlets of Shanxi Post, including taking over the management of all existing equipment for backup power supply, upgrading and transforming obsolete equipment, installing remote monitoring systems and providing power generation service in case of battery shortage. Customers only need to evaluate and supervise the service quality, and can enjoy uninterrupted power supply service with "zero operation".

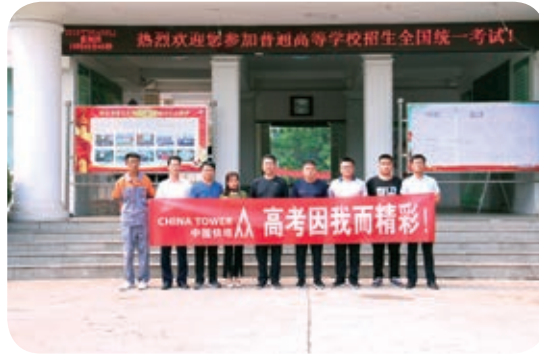


▲ Placing equipment for backup power supply, monitoring and power generation equipment

Building a Cyberpower through Sharing and Win-win Cooperation

Power assurance service provided in Henan

Henan branch proactively entered into strategic cooperation agreements with local government, power supply companies and the like to serve general customers with the Company's power assurance capability. By providing differentiated services, it provided uninterrupted power supply service for important activities throughout the province, such as all types of exams, conferences, sport events, exhibitions and cultural festivals. In 2019, Henan branch undertook a total of 636 medium and small-power assurance tasks, and was highly recognized by the public.



▲ Uninterrupted power supply providing assurance for exams and sport events

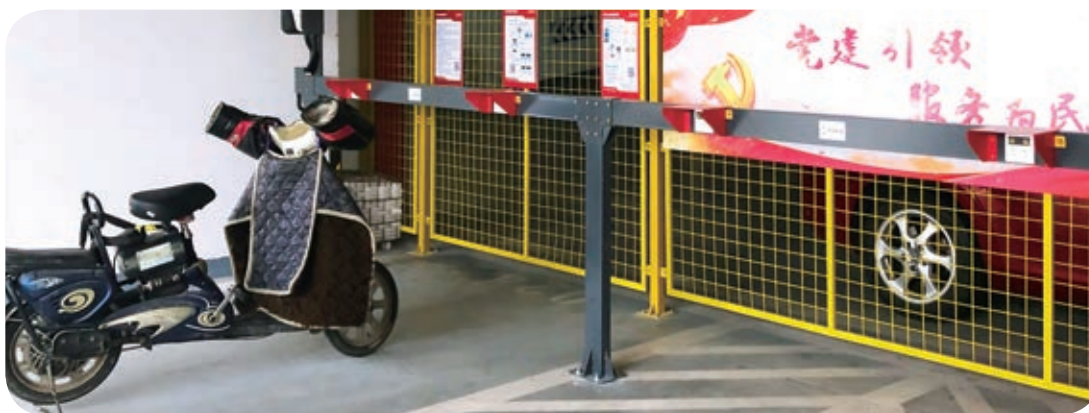
Building a Cyberpower through Sharing and Win-win Cooperation

Charging Services

The charging service, a project designed to improve people's well-being, is based on China's requirements on the charging of low-speed vehicles. The Company built charging piles for low-speed electric vehicles in residential quarters and factory areas to provide safe and standardized charging services, thus solving charging problems and eliminating serious hidden hazards.

Smart community charging project in Heyuan, Tianjin

With support from the local government, Tianjin branch carries out the "monitoring + charging" smart community project in Heyuan Community in cooperation with a property management company. On the basis of efficient sharing and coordination, and deployment of charging piles for low-speed vehicles, the Company installed additional sound and light alarm and monitoring devices for elevators and elevator control devices, which enabled AI-based early warning for electric bicycles, and combined "dredging" and "blocking", effectively solving difficult regulatory problems. In the first phase of the project, 350 charging ports for low-speed vehicles were built and put into operation, serving nearly 5,000 residents. Such work was unanimously highly recognized by the local government, the property management company and community residents.

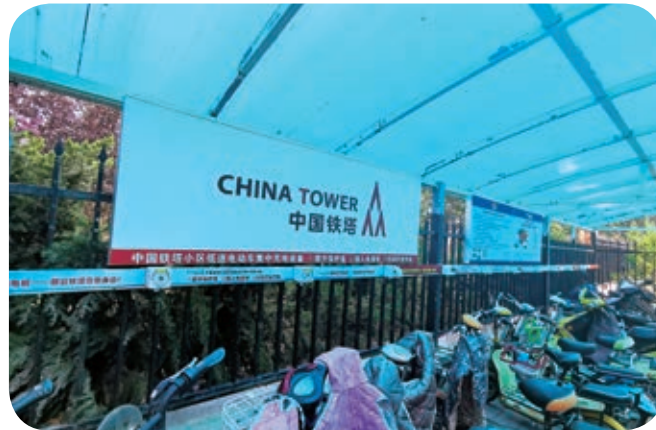


▲ "Monitoring + charging" in Heyuan Community

Building a Cyberpower through Sharing and Win-win Cooperation

Pilot project for charging low-speed electric vehicles in Shandong

In August 2019, Shandong branch launched the pilot project for charging low-speed electric vehicles in communities. By the end of 2019, it had implemented the project in 960 communities, put 42,478 charging ports into operation, and acquired 28,837 users of low-speed vehicle charging service.



▲ Charging of low-speed electric vehicles in a community

Battery Replacement Service

The battery replacement service is a convenient service provided for the food delivery and logistics sectors on the basis of China Tower's site resources, construction and maintenance capability, visualised, manageable and controllable monitoring platform and rich experience in application of lithium battery. By building battery replacement stations in areas where the majority of delivery drivers are providing their services, the Company replaced the original charging model with battery replacement, hence solving the problems of slow and unsafe charging for takeout food and express delivery drivers, and significantly enhanced the delivery efficiency and quantity, with which increasing the income of delivery drivers.

Building a Cyberpower through Sharing and Win-win Cooperation

Battery replacement service in Jiangsu Province

Jiangsu branch developed the battery replacement service in 13 prefecture-level cities in the province, built a total of 1,020 battery replacement centers and acquired 6,398 active users for its battery replacement service.



▲ Battery replacement centers

Recyclable Use of Power Battery

After the new energy vehicle's power battery expires, recyclable use is performed at the base station to fully meet the base station's backup power demand. With the high attention and strong support of the Ministry of Industry and Information Technology, the Company has energetically made a lot of explorations in the recyclable use of power battery. As at the end of 2019, the recyclable use of power battery has been applied in 300,000 base stations across the country, which is equivalent to the battery capacity of more than 90,000 electric vehicles. It accounts for 50% of the total retired batteries on the current market and can reduce carbon emissions by nearly 450,000 tons.



▲ Recyclable use of power battery site at the base stations



Innovation-driven Development to Underpin Existing Businesses

Adhering to Innovation-driven Development to
Improve Operations Management Efficiency

Enhancing Service Quality and Production Safety to
Provide Premium Service

Strengthening Compliance Operations to Improve
Risk Control Capability

Innovation-driven Development to Underpin Existing Businesses

Adhering to Innovation-Driven Development to Improve Operations Management Efficiency

Sustainable Development Strategy of China Tower

Adhering to innovation-driven development, the Company has continuously improved its independent innovation capability and stimulated the innovation vitality of employees at lower level based on its actual status, and enhanced operations management through technological and management innovation. Through product technology innovation, the Company will better meet the needs of customers and society to promote exchange of information and economic development; and with management mechanism innovation, the Company will improve work efficiency and resource usage, facilitate the industry's overall cost-effectiveness and boost its sustainable development.

Actions Taken by China Tower in 2019

Pressed ahead with product technology innovations to meet the needs of customers and the society

- Innovated 5G shared DAS and 5G power products to support the development of 5G
- Innovated tower structure and construction model to meet needs of construction better and faster

Innovated management mechanism to promote the industry's cost-effective solutions

- Promoted lean and efficient management and strengthened asset lifecycle management
- Set up data management centre and data operation centre to improve data application capability



Innovation-driven Development to Underpin Existing Businesses

(i) Product and Technology Innovation

The Company has actively seized the development opportunities of “cyberpower”, “digital economy”, “integration of artificial intelligence and real economy”, “big data” and “5G network deployment”, by increasing innovation-driven development, continuously improving independent innovation capabilities, and stimulating employees’ interests in innovation. A series of innovative achievements in certain fields and remarkable results in their applications have been achieved.

Innovation and R&D of 5G Shared DAS Products

In view of the difficulty of providing indoor coverage with outdoor 5G products as well as the inability of the existing DAS products to satisfy the high frequency of 5G, the Company led the industry chain to develop innovatively a series of 5G shared passive DAS products, and overcame the technical difficulties of high-frequency coverage in tunnels, effectively meeting the needs of 2/3/4/5G shared passive DAS. At present, through trial applications in buildings, metros and high-speed rail tunnel scenarios in multiple cities, 5G shared passive DAS products can significantly slash the construction costs of 5G indoor coverage.

Innovation and R&D of 5G Power Solutions and Products

Given the high-power consumption and the amount of power transformation need for 5G equipment, the Company cooperated the industry to innovatively develop and launch a series of technical solutions and products such as modular power and shared battery manager, to support the rapid and low-cost construction of 5G power supply. In particular, the modular power is flexible in capacity expansion and achieves a refined management, which can rapidly respond to the operators’ needs for shared capacity expansion and the cross-sector site service and information service companies’ needs for new business expansion; the shared battery manager for base stations can achieve parallel operation of new and old batteries, which cuts the construction and operation costs of battery during the capacity expansion of base stations.

Innovation-driven Development to Underpin Existing Businesses

Wide-angle leaky coaxial cable-based passive DAS

Xiongan Design Center is a landmark building in the Xiongan New Area, with an indoor construction area of 12,000 square meters. The venue is connected to six types of network systems of the operators' 2/3/4G network. During the construction, we adopted a passive distribution method of wide-angle leaky coaxial cables. For the first time, the existing passive DAS system was directly upgraded to 5G smoothly, achieving the sharing of the 5G DAS system. Compared with active DAS, the technology significantly saves construction costs and the operating costs such as energy consumption are reduced by more than 70%.



▲ Schematic diagram of DAS layout in Xiongan Design Center

Innovation-driven Development to Underpin Existing Businesses

Passive DAS

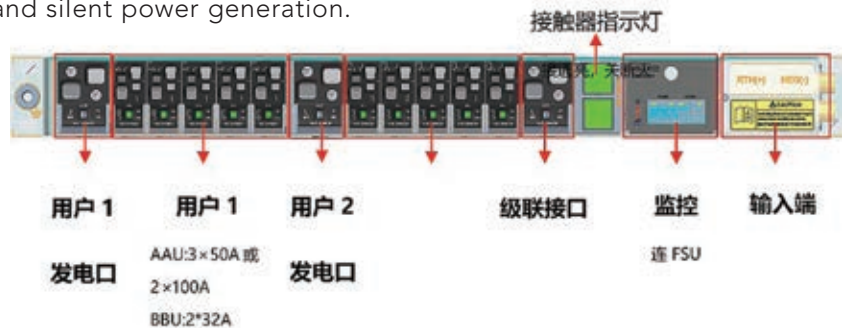
For the Qianshui peninsula project in Chengdu, in order to meet the needs of smart parking network and facilitate the customer's low-cost deployment, we decided to adopt the passive DAS through scenario analysis. After the traditional 5G shared passive DAS was employed, the speed and coverage quality can meet the 5G commercialisation standards after network testing, which is technologically feasible and economically reasonable. Through standard guidance, the Company promoted the industry chain to develop full-band devices and antennas that support 800-3700MHz. The Company has "low-cost and shareable" 5G passive DAS solutions, which can meet the operators' demand for 5G coverage.



▲ Smart parking site in Chengdu

Smart power distribution unit

Due to the high-power consumption of 5G equipment, the Company cooperated the industry and jointly developed a smart power distribution unit in order to meet customers' differentiated service demand for accurate measurement of the power supply of 5G equipment and different power generation durations. With a high-density and simple product design concept, the device can achieve simple delivery and rapid deployment, and meet the needs of accurate measurement of 5G load, on-demand ordering and silent power generation.



▲ Schematic diagram of smart power distribution unit

Innovation-driven Development to Underpin Existing Businesses

Innovation of Tower Structure and Construction Model

Knowing that most of 5G equipments are based on the existing towers, the Company carried out innovative research on the augmentation plan for existing towers, summarized and developed a refined technical improvement plan for existing towers, and applied it widely in the augmentation of existing 5G towers in different places, effectively improving the sharing of existing towers. The Company's project of "technical innovation and shared application of telecom towers" won the first prize of Science and Technology Award of China Institute of Communications in 2019.

Application innovation of 5G DAS shared products in Zhengzhou Metro Line 5

The Company adopted series of new products and technical solutions covered by 5G such as new 2.6GHz full-band combiners and new 5/4 leaky coaxial cables on Zhengzhou Metro Line 5. After testing, the average download rate at the Metro's platforms has surpassed 700Mbps, and the download rate in the cars during driving in the tunnel has reached 630Mbps, which provides a true and reliable reference for subsequent 5G construction in the Metro.



▲ 5G products application in metro platforms and tunnels

Innovation-driven Development to Underpin Existing Businesses

Application innovation of 5G passive DAS shared products in Chengdu

At the end of 2019, the Company launched a pilot application of 5G passive DAS shared coverage for buildings in Chengdu. Using the Company's innovative products such as 5G POI and enhanced connectors and passive DAS shared solutions, to support the sharing up to 12 sets of 2/3/4/5G systems provided by three operators, it has currently been connected to four 4/5G systems of China Mobile and China Telecom. The test results show that 5G passive DAS can fully meet the coverage and capacity requirements in ordinary building scenarios. In terms of cost calculation, compared with the operators' three self-built sets of 4/5G dual-mode micro cells, 5G passive DAS can substantially save investment and electricity costs of telecom companies. At present, this application pilot has been recognized by local telecom companies. The success of the pilot marks that the Company's low-cost 5G passive DAS shared solution in building and traffic tunnel scenarios has become fully practical, laying a solid foundation for follow-up scale development of 5G DAS business.

(II) Innovation of the Management Mechanism

Since its establishment, the Company has continuously promoted streamlined and efficient management, promoted the use of cost-effective solutions in the industry, and created economic value for the society while saving resources. In 2019, we have continued to promote management innovation and standardized management, optimize budget and performance management, deepen benchmark management of business units, push lean operation of assets, implement individual site accounting, and strengthen management throughout the lifecycle of assets; we also have continued to enhance independent site selection and maintenance capacity, further reduce costs, and propel the improvement of data operation capability. The Company has set up a data management center and data operation center to improve electronic account reconciliation and further improve data management capability. In 2019, the Company's project of "deepening the integration of industry and finance and building a digital operation system" won the first prize of Outstanding Achievements in Reform and Development of Chinese Enterprises in 2019.

Innovation-driven Development to Underpin Existing Businesses

Enhancing Service Quality and Production Safety to Provide Premium Service

Sustainable Development Strategy of China Tower

The Company always adheres to the principle of putting quality safety first and taking safety measures for safe construction while keeps improving our service level in respect of the concerns of our customers for safe, quality and reliable services, in order to promote the sustainable development of the Company's business. Meanwhile, the Company provides its employees with a nice and safe working environment and intensifies its efforts to improve work safety with a view assuring the safety of employees.

Actions Taken by China Tower in 2019

Put great efforts on work safety for avoidance of any accident:

- further improved safety rules and regulations
- conducted regular safety inspections
- changed safety training into a routine work

Improved service quality to meet the customer demands:

- built the complaint management system
- made multiple online and offline complaint handling channels available



Innovation-driven Development to Underpin Existing Businesses

(I) Putting Great Efforts on Work Safety

The Company strictly complies with relevant laws and regulations such as the *Production Safety Law of the People's Republic of China*, the *Regulations on the Administration of Work Safety of Construction Projects* and the *Provisions on the Administration of Work Safety of Telecommunications Construction Projects*, and strictly implements the work requirements on communication engineering quality and production safety management of Ministry of Industry and Information Technology, has formulated internal system documents such as the *Work Safety Management Manual* and established a safety inspection mechanism. In 2019, the Company published the administrative measures such as the *Regulations on the Administration of Work Safety of China Tower Corporation Limited*, the *Rules of China Tower on the Work Related Assessment*, the *Comprehensive Contingency Plan of China Tower for Work Safety Accidents*, the *Handling Measures for Report and Inspection of Work Safety Accident of China Tower*, which further improved the Company's work safety system and regime, and provided a basis for work safety management for branches at all levels as well as a strong guarantee for quality services.

Considering the features of its business operation, the Company requires its workers to engage in production work in strict accordance with the *Regulations on the Administration of Work Safety of China Tower Corporation Limited (Trial)*, the *Safety Management Manual of China Tower on Construction and Maintenance*, the *Administrative Measures of China Tower Corporation Limited on Tower Quality Maintenance and Safety (Trial)* and other documents, and has formulated a routine site facility inspection system in accordance with the safety operation requirements for tower base stations, specifying the inspection time of communication towers, shelters and supporting power facilities as well as some important sites. The Company distributes work orders to maintainers in a timely manner to track and handle any potential safety hazard found during the routine inspection, for the purpose of eliminating potential safety hazards at their sources and enhancing the safety of site equipment and operations.

Regarding the projects underway, the Company strictly implements the national laws and regulations such as the *Production Safety Law of the People's Republic of China*, the industry regulations such as the *Quality Supervision and Management Regulations on Telecommunications Construction Projects*, and its internal system requirements such as the *Implementing Rules on the Construction Safety Management*. It has established a contingency plan for work related accidents, specifying requirements for quality supervision and the



▲ Fire drill

reporting of construction project, filing procedures for acceptance of completed project, work safety costs, etc. Besides, the Company strictly requires employing officers responsible for the site, work safety managers and specialised construction operators who have relevant licenses, providing an all-around security guarantee for construction projects.

Innovation-driven Development to Underpin Existing Businesses

As for potential accidents, the Company complies with the *Handling Measures for Report and Inspection of Work Safety Accident of China Tower* to standardise the handling process of accident report. The Company focuses on the analysis of the eight most common safety accidents such as falling from high places and suffering from an electric shock, and requires its branches at prefecture-level cities to submit monthly reports over work safety accident to the provincial branches and from the provincial branches to headquarters on a monthly basis. In addition, for units in cooperation with the branch, the Company decides to strengthen the evaluation of safety accident accountability and establish a reward and punishment mechanism.

Safety overhaul



In order to further strengthen administration of work safety, the Company organises safety inspection for office operation, and project construction and maintenance annually, conducts follow-up supervision and inspection on issues identified in the inspection, and makes thorough rectification to eliminate hidden hazards.

Safety knowledge education



The production safety education and training constitutes an important part of the Company's work safety measures. Prioritising work safety in its routine operation, the Company keeps strengthening the awareness of "red line" and the thought of "bottom line" and enhancing employees' work safety awareness and skills through continuous education and training. A professional training team for production safety education dedicated to raise the safety awareness of staff was set up. The Company regularly holds Month of Production Safety, and organises special training on the Safety and Quality Management of Communications Construction Projects and training meetings on quality and safety every year. Besides, the Company vigorously drills in the message of "life and safety first" and implements the requirements for administration of quality supervision and work safety of communications projects stipulated by the Ministry of Industry and Information. All these measures help raise the safety administration standard of the Company.



▲ Seminar of common potential safety hazards for telecom towers

Innovation-driven Development to Underpin Existing Businesses

(II) Improving Service Quality

Adhering to the philosophy of “remain customer-centered and keep promoting the improvement of deficiency in services to keep enhancing customer satisfaction”, the Company makes great efforts to provide customers with services of better quality. To this end, a sound process, multiple channels and an effective assessment mechanism for customer service have been set up by the Company.

In order to provide more targeted services to customers, the Company has formulated the *Guiding Opinions on Service Work in 2019 (Trial)*, which shall be implemented across all the provincial and prefectural branches. China Tower understands customer demands through laying down standard working mechanisms such as the regular meeting on services, monthly report of services, etc. to enhance service level on an ongoing basis.

Customer Complaints and Settlement

The Company has set up multiple complaint acceptance channels both online and offline, including, among others, official WeChat account, China Tower APP and 10096 hotline. For more efficient handling of complaints, the Company requires ordinary complaints to be settled within three working days while urgent and major complaints within one working day. For the purpose of standardising the management of the Company’s customer service complaints, the Company has established a complaint management system to make record of every complaint and track each complaint throughout the process on a unified business platform for management, and incorporates the assessment results produced by the customer complaints management according to the branches at the province and prefecture level into the scope of reporting and assessment, for enhancing service quality of the customer service department. In addition, the Company applies a pre-management model on complaints of each branch, under which daily concerns of customers are checked and events that may occur or turn into customer complaints are solved in advance in order to enhance customer experience.

Operation & Maintenance Support and Guarantee

The Company has built a national and internet-based operation and maintenance monitoring platform for the centralised monitoring of millions of sites in China, thus an operation and maintenance system featured with primary platform, centralised management and local maintenance is formed, which can meet the requirements of monitoring on all equipment and network service assurance, and achieve intensive and efficient operation and maintenance, providing a strong guarantee for the normal operation of sites. The service disruption ratio caused by power failure was 5.2% in 2019, a drop of 11.8% from that in 2018.

During the selection of “Quality Trustworthy Group” in the telecom industry held by China Association for Quality in 2019, the branches of China Tower in Luoyang City, Meishan City and Linfen City were awarded “2019 Quality Trustworthy Group in the Telecommunications Industry”, and the branches of China Tower in Anyang City, Xingtai City, Suining City, Qiannan Autonomous Prefecture, Yuzhong City and Hefei City won the “2019 Encouragement Award for Quality Trustworthy Group in the Telecommunications Industry”.

Innovation-driven Development to Underpin Existing Businesses

Strengthening Compliance Operations to Improve Risk Control Capability

Sustainable Development Strategy of China Tower

While sticking to standardised operation, the Company keeps improving the compliance system and regime and proactively creates the culture of integrity and justice. It strengthens anti-corruption, sticks to rectification of ethos and enforcement of strict disciplines and advances the disclosure of information; keeps improving the risk management system to enhance risk-resistance capacity; continues to promote the implementation and improvement of policies, betters the supplier environment and social risk management level for a win-win situation between the Company and its suppliers; reinforces information safety assurance and pushes ahead the information safety system to be built for a sound information safety management system; and constantly boosts the implementation of internal administrative measures for patents so as to protect its own intellectual property rights and avoid infringing patents of the others.

Actions Taken by China Tower in 2019

Strengthened anti-corruption work to guarantee its development

- implemented an “embedded” risk prevention and control mechanism for company integrity in 2019 to build the first line of defense for business supervision
- conducted training and activities to warn and educate the employees at all levels for the purpose of warning and education

Reinforced risk management for sustainable and healthy development

- improved the risk management and internal control system for better prevention of risks
- Publicised and implemented the key points and examples of typical problems in audit and supervision, covering the business risk of the Company, for the purpose of helping employees be more aware of risks



Innovation-driven Development to Underpin Existing Businesses

Actions Taken by China Tower in 2019

Strengthened information safety to protect the rights and interests of stakeholders:

- built a complete information safety management system
- actively prevented and handled various information safety risks

Intensified intellectual property protection to retain corporate image:

- formulated patent management measures on intellectual property right for a unified management
- publicised operation compliance, formulated rules and set up a system to standardise the use of brand image

Beefed up supply chain management for a win-win situation between the Company and its suppliers:

- drove the supplier environment and social risk management level to be better
- improved the procurement system by adhering to the principle of honest procurement
- adopted the model of intensive procurement through e-commerce platforms for more efficient management

Innovation-driven Development to Underpin Existing Businesses

(I) Strengthening Anti-corruption Work

The Company strictly complies with the laws and regulations on anti-corruption, anti-money laundering and anti-fraud, including the *Regulations on Honest Practice for Leaders at State-owned Enterprises*, the *Anti-money Laundering Law of the People's Republic of China* and the *Anti-Unfair Competition Law of the People's Republic of China*, always abides by business ethics and operation compliance, and keeps perfecting the compliance risk management mechanism to maintain the mutual interests of the Company and its stakeholders and guarantee the development of the Company itself.

The Company is dedicated to continuously perfecting the three defensive systems of business supervision, audit supervision and discipline supervision, so that multiple supervision approaches are integrated to keep strengthening anti-corruption. In 2019, through focusing on implementing the “embedded” risk prevention and control mechanism for integrity and perfecting the internal control and management system, the Company gave a play to the roles of the first line defensive system for business supervision, to shift forward the risk prevention and control and to remedy the management loopholes. Twelve rules and regulations including the *Administrative Measures for Financial Examination*, the *Key Points of Review of Funds Payment*, the *Administrative Measures for Site Selection Fees*, the *Administrative Measures for Maintenance of Sites* were amended to refine the operation process and further solidify the management foundation. Meanwhile, the Company performed special supervision and examination on the system implementation in the key risk areas including the pays for leaders, selection and appointment of employees, funds management, bidding and procurement, etc., announced the issues found out and supervised and urged the rectification. It also carried out the “special rectification of the business transactions between the Company and enterprises set up by relatives of leaders and other specific related parties” as required by the higher authority to identify and exclude specific related parties for keeping the enforcement of the system of “list of enterprises prohibited for transaction”. In order to implement a stricter control on the violation of disciplines and rules, the Company amended the discipline execution and supervision systems of China Tower Corporation Limited, including the *Measures for Discipline Execution and Review*, the *Measures for Handling of Cases*, the *Implementing Measures for Complaint and Whistle-blowing on Discipline Inspection*, for better quality and higher efficiency of case reviews.

Innovation-driven Development to Underpin Existing Businesses

With regard to procurement and external cooperation, the Company requires an *Integrity Guarantee Contract* to be signed, requiring both parties to conduct business cooperation in strict accordance with national laws and regulations and the requirement of China Tower's "Ten Forbidden Things for Clean Operations", and the Company's regulatory personnel should witness and confirm the execution of such Integrity Guarantee Contract as the supervisor to perfect integrity management over the entire procurement process.

In 2019, the Company vigorously engaged in the promotion of honoring integrity when doing business. In particular, it published integrity building news in the OA integrity column to advertise risk prevention and control systems and regulations, and lectured the leaders and employees at all levels by integrity alert and special supervision on festivals and holidays, visiting warning and education base, attending court trials of bribery case, etc., with a view towards strengthening the education effect and keeping the alarm bell ringing. During a video conference on warning and education held by the Company in August 2019, more than 11,000 leaders and employees in key positions from provinces, prefectures and cities in China were notified of the issues found in audit and inspection and the typical cases investigated and handled in recent years, in order to remind the leaders and employees of honoring discipline in awe and respect, and never going beyond the bottom line. They were also required to learn from, understand the cases and make rectification on the basis of such understanding to create a favourable environment which is clean and upright for the Company's transformation and upgrading and for the high-quality development.

(II) Reinforcing Risk Management

In 2019, the Company further optimised and improved its risk management system by defining the highest coordination and deliberation agency, optimising and adjusting major risk areas, re-clarifying all important business processes, identifying the potentially risky matters, formulating strategy to address risks, updating and improving the *Measures of China Tower Corporation Limited for the Management of Risks* and the *Risk Control Manual*. The Company has made risk management a routine work and implemented the requirements of daily risk prevention and control, offering effective guarantee for achieving the Company's strategic and operation goals.

Innovation-driven Development to Underpin Existing Businesses

(III) Strengthening Information Safety Guarantee

The Company strictly complies with the laws and regulations which include the *Cybersecurity Law of the People's Republic of China* and the *Administrative Measures for the Protection of Information Safety Classes*, and performs data-related governance in accordance with the relevant requirements of the ministries and commissions, including the *Management Guidelines for Big Data Safety* and the *Implementation Guidelines for Big Data Risks*, as well as other relevant national standards. The Company has set up a complete information safety management system and keeps enhancing its ability to maintain information safety in order to effectively prevent and handle various information safety risks. The Company has formulated a series of systems and measures, including the *Administrative Measures for Network Security*, the *Administrative Measures for Data Security*, the *Administrative Measures for Information System Construction*, the *Administrative Measures for Information Safety of Third Parties*, the *Plan for Emergency Management of Safety Events*, to standardise the information safety management for internal data. Besides, in order to avoid information leakage, all external personnel who have access to the application system server are required to sign the *Letter of Confirmation on Confidentiality for the System Information Safety of China Tower*.

(IV) Intensifying Intellectual Property Protection

In January 2018, the Company issued the *Administrative Measures for Patents*, stipulating specific duties of all departments in patents management and strict examination and approval procedures, detailing key protection points before and during patent application and after approval of the patent, and setting out the requirements for the promptness of patent applications, patent retrieval in advance and confidentiality, for effective protection of technical innovations. In 2019, the Company performed patent management based on the principles of unified management, focusing on protection, strengthened maintenance and effective reward and punishment.

In addition, the Company carried out the compliance promotion in strict compliance with the requirements of the *Advertising Law of the People's Republic of China*, the *Trademark Law of the People's Republic of China*, as well as the regulations of the Ministry of Industry and Information Technology and other competent authorities. The Company has formulated the *Identification System Manual of China Tower Corporation Limited* to standardise the use of trademark and brand image, along with external promotion through multiple channels and internal publicity and implementation activities, to advertise the Company's aim, actions and functions to the public for enhancement of the corporate image.

Innovation-driven Development to Underpin Existing Businesses

(V) Beefing Up Supply Chain Management

Adhering to the philosophy of “win-win cooperation” between the Company and its suppliers, the Company consolidates supply chain management with the aim to “strengthen procurement management and reduce procurement costs”, keeps optimising e-commerce procurement platform and promoting the closed-loop quality management system boosts the professional management of warehousing, for the purposes of consolidating management foundation and actively improving the level of supply chain environment and society management.

Intensive Procurement through E-Commerce Platforms

The Company has built an intensive, efficient, standardised and transparent supply chain system. Giving play to the strengths of intensification and procurement through e-commerce platforms, the Company further boosted the reform of procurement model in 2019 for and replaced it with the model of intensive procurement through e-commerce platforms which takes shape on the basis of the featured e-commerce platform of China Tower.

The general operational supplies across China are procured by the headquarters, while the remaining supplies mostly by the provincial companies. The random and customised supplies may be purchased by companies in prefectures. The headquarters finished the procurement of feeders, power cables and air conditioners in 2019, with the price of which dropped by 22% on average, in accordance with the principle of “purchase supplies intensively if possible, reduce purchasing costs and implement strict quality management and control”.

The Company has formulated the guiding opinions on intensive procurement for construction services and the implementation plan, which are being advanced orderly by each of the provincial companies, with the ongoing smooth transition of procurement model migrating from the old one to the new.

Closed-loop Quality Management System

The Company’s closed-loop quality management system takes shape, featured with “standard specification, testing of network admission, inspection of delivered goods and strict management of contract performance”, which specifies the admittance criterion for suppliers of various products, including supplier’s environment and social performance, as well as necessary quality, environmental and social management system certificates.

Innovation-driven Development to Underpin Existing Businesses

The general supplies are inspected for network admission upon arrival and acceptance, of which the former is the first step to check whether the products are qualified and good. The towers, air conditioners, DAS, cabinet, batteries and other products are inspected casually upon arrival, covering all suppliers and all batches, following the principle of “casual inspection for all goods purchased intensively”. The suppliers of unqualified goods will be subject to punishments such as fines, re-delivery, removal and replacement of used products until they are taking away from the shelves.

Refined Management of Supplies

Adhering to the philosophy of “zero stock”, the Company controls the inventory level and puts long-term stock under strict control to enhance stock turnover, boost destocking and control inventory structure. In 2019, the average monthly stock turnover was 144%, an indication of the effective use of warehouse stocks.

The Company keeps strengthening the management of its warehouse, especially the lithium battery safety management, by refining the requirements for warehousing, logistics and packaging. Considering the features of lithium battery, the infrared thermal imaging monitoring was added for early warning, and the administrative measures for monitoring, early warning and safety of lithium battery warehousing were laid down.

Disposal of Scrapped Supplies and the Use of Old Items

The Company boosts the efficient use of idle supplies for saving social resources and reducing construction costs. It specifies the repairing process and the reuse of scrapped and old supplies, adhering to the principle of repairing instead of dumping scrapped and old supplies, in order to assure storage, identification, maintenance and use of scrapped and old supplies and hence standardise and normalise the repair and use of old supplies.

The Company presses ahead quick disposal of scrapped supplies and organises the unified sales of national scrapped lead-acid batteries for efficient and standard disposal. The scrapped lead-acid batteries were included in the National Catalogue of Hazardous Wastes for management and factory inspections were organised to ensure that the disposal and transshipment comply with national regulations on environmental protection.

Building a Beautiful China for Harmonious Development

Putting Green Concept into Practice to Promote
Sustainable Development

Contributing Proactively to the Society while
Fulfilling Corporate Responsibility

Protecting the Rights and Interests of Employees
and Facilitating Employee Development



Building a Beautiful China for Harmonious Development

Putting Green Concept into Practice to Promote Sustainable Development Sustainable Development Strategy of China Tower

Sticking to the concept of “lucid waters and lush mountains are invaluable assets”, the Company has been adhering to the concept of green development and actively fulfilling environmental responsibilities to boost green development and build an ecological-friendly environment. The Company continues to focus on climate change, and remains committed to integrating green development into its operation and business, while substantially minimising the environmental impact arising out of business development through waste material recycling and use of technologies. In addition, the Company places emphasis on raising the environmental protection awareness of employees and endeavours to reduce the adverse impact of tower construction on the surrounding environment, with the aim of helping build a beautiful China.

Actions Taken by China Tower in 2019

Advocating green operation and actively saving energy while reducing emission during the operation and maintenance of base stations

- Energy management system monitors the energy consumption of base station equipment in real-time by adopting the Internet of Things (IoT) technologies
- High-efficiency modules for air conditioning control and switch-mode power supply were applied
- To the extent possible, all dismantled waste materials were identified and sorted by professional personnel assigned by the Company for recycling
- All scrapped and unrecyclable materials were treated and disposed of in strict accordance with national regulations



Building a Beautiful China for Harmonious Development

Actions Taken by China Tower in 2019

Putting green policies into practice in the office work and continuously advocating the ideas and transferring knowledge of energy conservation and emission reduction

- Saving electricity
- Saving water
- Paperless working

Helping build a beautiful China by lowering construction costs and conserving land

- Utilising existing resources of the society in a unified way and putting the construction of new towers under strict control

(I) Green Operation

Since its establishment, the Company has strictly complied with such laws and regulations as the *Environmental Protection Law of the People's Republic of China*, the *Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste* and the *Law of the People's Republic of China on Energy Conservation*, took the initiative to fulfil environmental responsibilities, and advocated green operation with an aim to reduce the adverse impact of its operation on the environment. In 2019, we rolled out the *2019 Guidelines for Energy Conservation and Emission Reduction*, and made proactive explorations in such fields as waste materials recycling and application of energy-saving techniques, in an effort to press ahead with energy conservation and emission reduction.

Building a Beautiful China for Harmonious Development

Recycling of Waste Materials

The Company adheres to the principle of “recycling over scrapping”. For waste materials arising out of the operation of base stations, the Company developed appropriate management systems, such as the *Administrative Measures of China Tower for Scrapping and Disposing Fixed Assets (Trial)* and the *Guidelines for Accelerating the Disposal of Waste Materials (Trial)*, continued to improve the standardised management of waste materials recycling, and strived to tap into the potential value of waste materials for raising the utilisation efficiency, under the precondition that the safety and quality requirements were met. According to the *Law of the People’s Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste* and other related laws and regulations, professional personnel were designated for identification and sorting with a view to classifying all scrap materials into four categories, namely materials directly usable, usable after maintenance, partial accessories usable, and unusable. The materials falling into the first three categories were disposed of according to the three approaches: direct recycling, recycling after maintenance/repair and recycling after reassembly. Scrapped and unrecyclable materials are disposed of in strict accordance with the national regulations.



Direct recycling

A list of usable materials is made for materials identified to be directly usable, and the construction and maintenance departments are responsible for their usage in new and reconstruction projects.



Recycling after maintenance and repair and repair

For materials identified to be of use value after maintenance, they are recycled and reused after maintenance by professional agencies.



Recycling after reassembly

For materials with some usable parts, they are put together and assembled into new usable equipment by professional agencies with the parts from different equipment and being included into the list of usable materials. The construction and maintenance departments are responsible for recycling and reusing them in the new and reconstruction projects or removing the usable part to be used as spares for other equipment.

Building a Beautiful China for Harmonious Development

Practice of asset integration and recycling by Henan Branch

Currently, Henan Branch has established a centralised provincial maintenance centre and an asset integration centre to facilitate the centralised maintenance, integration and recycling of waste assets and the malfunctioning equipment across Henan Province. In 2019, a total of 992 air conditioners and switch-mode power supplies were reassembled and repaired, 2,932 spares were dismantled, 23,963 plates were repaired and recycled, and 6,286 2V500AH lead-acid batteries were repaired and reassembled, all of which were put into reuse.

Application of Energy-saving Techniques

To enhance energy consumption efficiency of base station shelters during operation and service provision, the Company has independently developed an energy management system. Adopted the IoT technology in an innovative manner, this system monitors the energy consumption of various facilities in base station shelters precisely and in real-time. In addition, it also assessed electricity consumption indicators of base stations with big data technology, analysed the electricity consumption pattern of base stations and provided energy conserving solutions. Measures such as collecting and analysing energy consumption data of base stations, energy-saving management and control of air-conditioning and applying high-efficiency modules of power supply effectively supported the Company in improving its energy-saving level.

Installation of air-conditioner controller

The remote control of the startup and shutdown of air conditioners was realised through the installation of air conditioner controller. The air conditioner would shut down automatically once the indoor temperature reached the set temperature, enabling an average energy-saving of 20% for each conditioner.

High-efficiency modules were used to improve the alternating/direct current conversion efficiency from 94% to 97%-98%.

Use of high-efficiency module

Building a Beautiful China for Harmonious Development

(II) Green Office

The Company strictly complied with the *Law of the People's Republic of China on Energy Conservation*, advocated the ideas and spread the knowledge of energy conservation and emission reduction among the staff with various approaches. In the meantime, it launched the green office training. With reinforced the management of electricity and water consumption at office premises, the Company deployed water-saving appliances and promoted paperless office. China Tower adopted the internal e-commerce procurement system, the purpose of which was to reduce resource consumption of various departments in the course of procurement.



Saving electricity

The Company prefers to use environment-friendly and energy-saving electric appliances and equipment, and gradually phased out energy-intensive facilities and equipment with low energy efficiency. The Company's staff are required to turn off lights when leaving the rooms and power down TV, computer, water dispenser and other electric appliances when they are not in use, which could both save electricity and prevent the potential risk of fire caused by socket short circuit.



Saving water

The Company's staff are required to start from dribs and drabs by developing a habit of saving water and practicing it in their daily work. We posted signs advocating water conservation at places such as restrooms. Employees were also reminded to turn on the tap as small as possible and turn it off afterwards. Maintenance of water facilities were carried out to prevent water leakage.



Paperless office

The Company makes full use of the online office system to reduce printing and distributing of paper documents and the usage of faxes. Recycled paper and double-sided usage is promoted in order to reduce the use of paper by way of recycling.

Building a Beautiful China for Harmonious Development

(III) Building a Beautiful China

Utilising existing and social resources in a rational way, the Company strictly limited the number of new towers built and tried to make the best of existing towers for sharing, with the principle of “sharing existing towers instead of building new ones, and giving preference to jointly-built towers to those owned by a single entity”, effectively reduced resources used by new tower such as land, steel, cement and cable, thus cut construction costs and reduced the utilisation of land resources. Tower structures and building solutions in line with the environment rules were also adopted by the Company to facilitate the harmonious integration of telecom infrastructure into its surroundings. With these moves, the Company strived to make contributions to the building of a resource-saving and environmentally-friendly society.

Trial integration of tower into Wuhan Yellow Crane Tower

Located on the Sheshan Hill, Wuchang District, Wuhan City, Yellow Crane Tower tourist area is a well-known 5A scenic spot in China. As traditional construction solutions cannot meet the ecological and landscaping requirements for the scenic spot, the telecommunications construction had been put to a standstill for many years, with the provision of telecom signal coverage difficult in the tourist attraction. Based on the actual situation of the Yellow Crane Tower, the Company, employed the integrated solution for mobile network coverage, decided to tackle the problem by leveraging professional “network testing + capacity analysis + network simulation”. By furthering sharing and cooperation with multiple parties and taking advantage of every resource in the spot, the Company created a solution featuring “low cost, high efficiency and excellent service”. In the meantime, the Company set up a multidimensional network coverage system covering 2 macro cells, 6 micro cells and 1 DAS, and applied an innovative and ecological integrated construction model as well as the DAS coverage technology using wide-angle radiation leaky coaxial cable, achieving a harmonious integration of base station into the scenic spot.



▲ Smart smoke detector at Baiyun Pavilion of Yellow Crane Tower



▲ IoT antenna at Yellow Crane Tower

2019 Shanghai Artificial Intelligence Summit

The 2019 Artificial Intelligence Summit, themed “New Picture of AI Life”, was held at the World Expo riverside area of Lujiazui. At the summit, 8 application scenarios and 29 demonstration projects were presented, highlighting the role of Shanghai in serving the national strategy and boosting the development of artificial intelligence. The Company selected rational building solutions based on customers’ needs to share resources and save investments. It carried out 4 direct mounting of base stations using social resources, built 7 landscape-like towers, and conducted 5G upgrading and transformation for 167 existing base stations. To make up for the lack of transmission line, the Company deployed social transmission lines and made use of other social resources holistically and effectively, thus resolved issue of finding home for optical splitter boxes. In addition, the Company initiated environmental integration construction based on the local conditions, made use of the existing structures at the site (such as tower cranes and lamp towers) and applied hidden antenna construction technology to achieve organic integration with the urban setting and the environment.



▲ Venue of the summit

Building a Beautiful China for Harmonious Development

(IV) Environmental Data Performance Tables***Greenhouse gas emissions***

Indicators	2019	2018
Greenhouse gas emissions (categories 1&2) (unit: tonnes of CO₂e)	36,209.45	35,065.28
Direct greenhouse gas emissions (category 1) (unit: tonnes of CO₂e)	1,751.96	1,624.68
Natural gas (Tonnes of CO ₂ e)	1,751.96	1,624.68
Indirect greenhouse gas emissions (category 2) (unit: tonnes of CO₂e)	34,457.49	33,440.60
Purchased electricity (unit: tonnes of CO ₂ e)	34,457.49	33,440.60
Greenhouse gas emissions per unit of operating revenue (categories 1&2) (unit: tonnes of CO₂e/million yuan)	0.47	0.48

Note:

- Due to the nature of the Company's business, the greenhouse gas emissions include carbon dioxide, mainly resulted from outsourcing electricity and natural gas consumption. The scope of greenhouse emission data covers the headquarters, provincial offices and municipal offices. Greenhouse gas emissions are measured in carbon dioxide equivalents and calculated based on the 2017 Baseline Emission Factors of Regional Power Grids in China for Emission Reductions issued by the Ministry of Ecology and Environment of the People's Republic of China and the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories issued by the Intergovernmental Panel on Climate Change (IPCC).

Resources consumption

Indicators	2019	2018
Energy consumption (unit: MWh)	62,794.54	58,026.88
Direct energy consumption (unit: MWh)	8,959.79	8,308.87
Natural gas (unit: MWh)	8,959.79	8,308.87
Indirect energy consumption (unit: MWh)	53,834.75	49,718.01
Purchased electricity (unit: MWh)	53,834.75	49,718.01
Energy consumption per unit operating revenue (unit: MWh/million yuan)	0.82	0.81
Water consumption (unit: tonnes)	1,030,940.46	1,404,706.65
Water consumption per unit operating revenue (unit: tonnes/million yuan)	13.49	19.56

Notes:

- The main energy consumption of the Company is purchased electricity and natural gas.
- The scope of energy consumption data covers the headquarters, provincial offices and municipal offices.
- Energy consumption data is calculated based on the consumption of electricity and fuel, and the conversion factors provided in the *General Principles for Calculation of Total Production Energy Consumption (GB/T 2589-2008)* issued by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China and the Standardisation Administration of the People's Republic of China.

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Waste

Indicators	2019	2018
Total Hazardous Waste (unit: tonnes)	91,160.40	62,393.4
Waste Lead-acid Batteries (unit: tonnes)	91,160.40	62,393.4
Annual Total Hazardous Waste Per Unit Operating Revenue (unit: tonnes/million yuan)	1.19	0.87
Total Non-hazardous Waste (unit: tonnes)	3,744.20	5,373.31
Total Non-hazardous Waste from Shelter (unit: tonnes)	3,638.38	4,859.4
Waste Air Conditioners of the Shelters (unit: tonnes)	2,205.19	3,868.6
Waste Switch-mode Power Supply of the Shelters (unit: tonnes)	1,433.19	990.8
Total Non-hazardous Waste from Office (unit: tonnes)	666.11	513.91
Office Papers (unit: tonnes)	661.38	513.78
Waste Electronics (unit: tonnes)	0.84	0.13
Office Supplies Consumption (unit: tonnes)	3.89	-
Annual Total Non-hazardous Waste Per Unit Operating Revenue (unit: tonnes/million yuan)	0.056	0.075

Note:

- Due to the nature of the Company's business, the main hazardous waste is the lead-acid battery used in the shelter. The weight of discarded lead-acid batteries is estimated according to the equipment model.
- In terms of the disposal and use of waste lead-acid batteries, the Company handles waste lead-acid batteries in strict accordance with laws and regulations such as the *Environmental Protection Law of the People's Republic of China*, the *Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste*, and the *Technical Specification for Pollution Control of Waste Lead-Acid Batteries (HJ 519-2009)*.
- The scope of office paper includes the A3/A4 paper purchased annually by headquarters, provincial offices and municipal offices. The total weight is estimated by the types of paper.
- Waste electronics include microcomputer hosts, laptops and printers.
- Office supplies include roller pens, clips and staples purchased annually by headquarters, provincial offices and municipal offices. The total consumption is estimated by the types of supplies.

Building a Beautiful China for Harmonious Development

Contributing Proactively to the Society while Fulfilling Corporate Responsibility

Sustainable Development Strategy of China Tower

The Company is always committed to contributing to society and fulfilling its responsibilities. Amidst the background of poverty eradication and reduced inequalities across the world, the Company strengthened capabilities of site planning and resource integration and utilization and promoted the building of mobile networks in remote areas to narrow the digital gap and improve the popularity of universal telecommunications services, in response to the national Cyberpower strategy. Focusing on targeted poverty alleviation and communication poverty alleviation, we made efforts in linking provision of assistance to industrial projects with the generation of internal profit-making capability, combining poverty alleviation through telecom service with the help of e-commerce, and realizing poverty alleviation with education improvement, highlighting the quality and achievements of poverty alleviation. The Company actively fulfilled the responsibility of communication emergency security, continuously improved the communication emergency security system, and formulated an emergency management system, providing communication security for disaster relief, various emergencies and major social activities. We focused on encouraging young employees to participate in various volunteer services and supported the youth to carry out poverty alleviation activities in various forms.

Actions Taken by China Tower in 2019

Helping telecommunications companies complete the pilot program of universal telecommunications services in a timely manner and successfully to promote the building of mobile networks in remote areas

- approximately 5,500 of the fifth-batch pilot programs in the field of universal telecommunications services were undertaken in 2019

Assisting in targeted poverty alleviation and forming a multi-channel and multi-carrier poverty alleviation system

- Through various poverty alleviation methods, a total of 52,972 households and 168,433 people of three counties were helped out in targeted poverty alleviation



Building a Beautiful China for Harmonious Development

Actions Taken by China Tower in 2019

Advancing communications poverty alleviation to help narrow the “digital gap” in poverty-stricken areas

- A total of RMB11.13 million was invested throughout the year to build and renovate 204 towers in Xuan'en county, Hefeng county of Hubei Province, and Baojing county of Hunan Province, providing strong support for local e-commerce

Ensuring emergency communications, and assisting in disaster relief, various emergencies and major social activities

- Providing emergency communication support during natural disasters such as typhoon Lichma
- Providing emergency communication support during situations such as the outbreak of COVID-19
- Providing emergency communication support for major events such as the 70th anniversary of the founding of the People's Republic of China

Being enthusiastic in volunteer service and carrying the spirit forward

- As of the end of 2019, the Company had 2,894 registered young volunteers. A total of 863 youth volunteer activities were launched throughout the year with 8,826 people participating in various volunteer activities



Building a Beautiful China for Harmonious Development

(I) Universal Telecommunications Services

Since its establishment, the Company has diligently fulfilled its social responsibilities as a state-owned enterprise, made great efforts in expanding network coverage in rural, mountainous and remote areas, and helped telecommunications companies complete the pilot program of universal telecommunications services on time. As the universal telecommunications services continue to expand, it is gradually extended to borders, provincial boundaries, and remote rural areas. Faced with less resources and even more difficulties in construction, the Company intensified independent site location, put newly built ground base stations under control, pushed sharing of social resource, and fully integrated topographic features into that of the sites, completing the task of building communication networks in remote areas faster, better, and more economical. 5,500 pilot programs of universal telecommunications services in the fifth-batch were undertaken in 2019.

(II) Offering Help to Targeted Poverty Alleviation

The Company took the initiative to undertake assistance tasks in targeted areas designated by central and local governments. Based on resource advantages and business characteristics, it carried out targeted poverty alleviation to help achieve the goal of lifting all underprivileged people in rural areas under the current standard out of poverty by 2020, and to enhance its influence and brand image. In 2019, leveraging its industrial resources, the Company strengthened organizational leadership and selected outstanding poverty alleviation cadres to provide fixed-point assistance. With the “three linkages” of communication poverty alleviation with consumption poverty alleviation, industrial project assistance with the enhancement of development capabilities, and poverty alleviation with educational improvement, the Company formed a poverty alleviation system based on methods of communication poverty alleviation, industrial poverty alleviation and consumption poverty alleviation, with participation by branches at all levels, industrial cooperation chains and social forces.

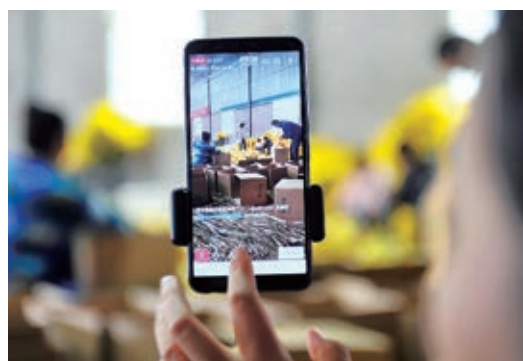
Building a Beautiful China for Harmonious Development

Poverty Alleviation with the Help of Telecommunication

Responding to the call of the government, the Company took proactive actions in tackling poverty with the help of telecommunication and narrowing the digital gap, and carried out poverty alleviation activities by means of providing better telecommunication services, with focus on achieving the goal of 4G coverage nationwide.



In 2019, the Company invested a total of RMB11.13 million to build and renovate 204 towers on the basis that the telecommunication service indicators of Xuan'en County and Hefeng County in Hubei Province, and Baojing County in Hunan Province reached the national poverty alleviation standards, further expanding 4G coverage and providing strong support for local e-commerce. In 2019, farmers in Xuan'en County sold local Gong Pomelo through live streaming with mobile phones relying on local high-quality telecommunication networks; the e-commerce transactions of Hefeng County reached RMB670 million, a year-on-year increase of 9.4%, of which transactions of agricultural products amounted to RMB210 million, driving up the per capita income of 24,000 poor households an increment of RMB2,100.



▲ Farmers in Xuan'en County selling local Gong Pomelo through live streaming with mobile phones

Building a Beautiful China for Harmonious Development

Poverty Alleviation through Industrial Development

Based on local conditions, the Company planned to build industry which lasts long, enabled farmers to “learn how to fish but not to rely on the fish given” to further enhance the development potential. 8 planting and breeding cooperatives in three counties and three villages were established to provide solid guarantee for the development of collective economy, helping lift 1,229 registered underprivileged people out of poverty. In 2019, the Company invested a total of RMB4.288 million in targeted assistance, an increase of 40% over 2018.

The Company adopted the model of “factory + base + farmer”, invested RMB1 million to build a tea processing plant with 820 square meters in Mayang Zhai Resettlement Site, Enshi, a tea planting base spanning 1,000 mu (666 square meters) has attracted 83 households in 2019; The Company innovated the model of “planting base + capable people + farmers”, invested in the construction of a new chicken breeding base in Banliao Village, Hefeng County, which attracted returnees by means of leasing assets and equipment, drove employment through capable people, and developed breeding hens of more than 10,000, honoring it as the “first breeder village” in Enshi; The Company adopted the model of “company + cooperative + farmer”, invested nearly RMB1 million to develop a 100-mu Golden Tea Park Cooperative in Zhongxi Village, Baojing County, with a net income of RMB800,000 per year and a total income of the village of RMB240,000 per year.

At the same time, the Company kept carrying out various technical training aimed at serving the industry and continued the black pig breeding project in Longtanhe Village with an investment of RMB150,000, augmenting the annual income of poor households by RMB1,500 and collective income of the village by RMB50,000; The Company went on with the chicken breeding project in Zhongxi Village, with the scale of breeding reaching 36,000 chickens, achieving an increase of RMB3,000 in per capita income of poor households, and generating RMB80,000 of collective income.



▲ China Tower-aided tea factory



▲ Practical technology training in Longtanhe Village

Building a Beautiful China for Harmonious Development

The Company shoulders the responsibility for poverty alleviation

On 4 September 2019, Chairman Mr. Tong Jilu and other delegates went to Zhongxi Village, Qingshuiping Town, Baojing County, Xiangxi Tujia and Miao Autonomous Prefecture, Hunan Province to investigate poverty alleviation. The Chairman and other delegates conducted on-site inspections on the chicken and bee-breeding industrial bases as well as the Golden Tea Demonstration Park built with the aid of the Company, and asked in detail about breeding, planting costs, and farmers' income. The Chairman, knowing that the average household income has increased considerably, was very pleased about the changes brought to the village through poverty alleviation. Afterwards, the Chairman visited poor households and wished everyone a better life.



▲ Chairman Mr. Tong Jilu visiting the Golden Tea Demonstration Park



▲ Chairman Mr. Tong Jilu communicating with farmers

Consumption Poverty Alleviation

The Company promoted the model of prioritising purchasing over donation and played an active part in the promotion and sales of agricultural products in poverty alleviation areas. The Company established an e-commerce platform, China Tower Xuan'en Poverty Alleviation Museum, where 19 kinds of poverty alleviation products were listed, provided fixed booths for Baojing Golden Tea, Xuan'en Honey Pomelo Tea, and Hefeng Alpine Potato. It called on employees at the headquarters and provincial branches to purchase agricultural products from poor areas to further expand the scale of consumption poverty alleviation.

In 2019, the headquarters and provincial branches of the Company purchased agricultural products worth a total of RMB2.636 million from poverty alleviation areas. Meanwhile, the Company devoted greater efforts to advertise these agricultural products and helped sell agricultural products totalling RMB682,000 in poverty-stricken areas, achieving great success in alleviating poverty by consumption.



▲ Poverty alleviation e-commerce platform

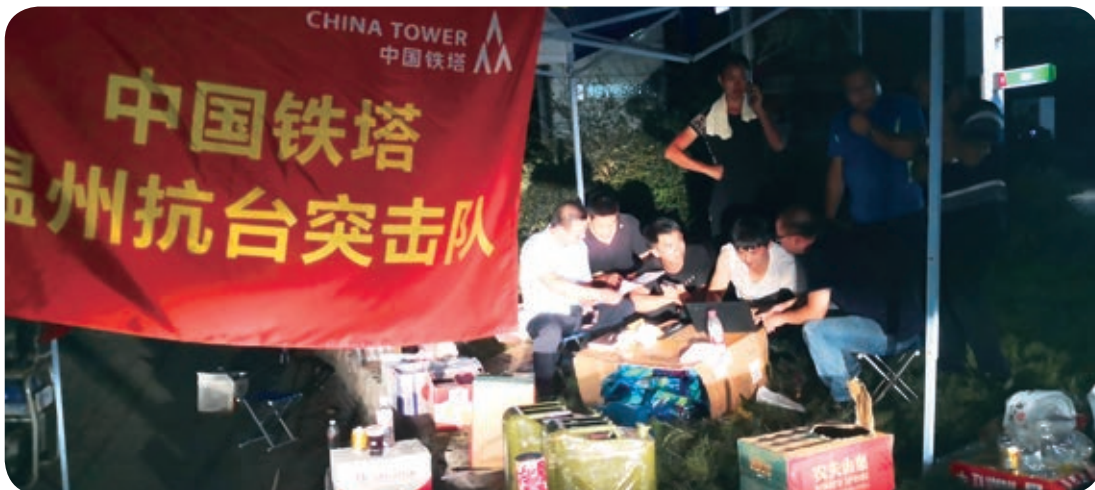
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(III) Providing Emergency Communication Services

The Company proactively fulfilled the responsibility of providing emergency communication services, continuously improved the communication security system, and formulated an emergency management system, providing emergency communication for disaster relief and various cases of emergencies. In 2019, the Company further optimised the emergency management system, enriched and integrated the contents of the original daily prevention mechanism; perfected the emergency service link, and clarified the requirements for conferences, guarding, on-scene command management, and coordination with operators; optimised and supplemented the reporting process of information in an all-around way. By clarifying various emergency levels, the timeliness and accuracy of information communication during the incident handling processes at all levels were further enhanced.

Emergency communication during natural disasters

In August 2019, Typhoon Lichma landed in Zhejiang. China Tower attached great importance, and according to the typhoon landing trajectory forecasted by the Meteorological Department, carried out comprehensive inspections, facilities reinforcement, and material deployment in key areas in advance to ensure that emergency security personnel, vehicles, and oil engines were in place. In this communication service, the Company dispatched a total of 50,127 rescue personnel, 25,799 emergency vehicles, and 35,089 diesel power generators, protecting the communication and thus safeguarding the lives of people.



▲ Interim anti-typhoon headquarters in Dajing, Yueqing, Wenzhou

Communication coverage during public emergencies

At the end of 2019, multiple cases of COVID-19 were confirmed in Wuhan, Hubei Province. In order to fight actively against the epidemic, on 23 January 2020, the Wuhan Municipal Government decided to build Huoshenshan Hospital. That night, the Wuhan Branch of China Tower and local carriers quickly deployed the mobile communication network coverage of Huoshenshan Hospital to ensure simultaneous delivery of mobile communication network facilities to the hospital. On 25 January, Wuhan Branch completed the construction and delivery of power, supporting facilities, and towers of the first-floor base station. On 26 January, by adopting the model of a 35-meter tower-house integrated tower construction, the construction of the second base station tower and supporting facilities was completed, and the construction period was greatly shortened, helping achieve full coverage of 2G, 3G, 4G and 5G within 500 meters around Huoshenshan Hospital. Upon completion of the communication base station infrastructure of Huoshenshan Hospital, Wuhan Branch quickly rushed to Leishenshan Hospital for the expansion of wireless broadband network. By reconstructing the existing ground base station in Athletes' Village for Military World Games, it quickly completed the reconstruction of ground base station facilities according to the coverage plan of the newly built floor base station.



▲ Construction site of Wuhan Huoshenshan Hospital and Leishenshan Hospital

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Communication coverage assurance during the COVID-19 outbreak

During the outbreak of COVID-19, the Company proactively undertook social responsibilities, and teamed up with three carriers to combat against the epidemic, comprehensively ensuring the stable operation of the key regional security sites in virus-stricken areas. The Company provided important communication support for a total of 28,000 base stations in key areas for epidemic prevention and control, sent a total of about 140,000 security personnel, over 72,000 vehicles, over 86,000 oil engines, and over 28,000 stations for power generation to cover the need for epidemic prevention and control.



▲ Dispatching command



▲ Securing power generation of Wuhan Huoshenshan Hospital

Education network security in remote areas during the outbreak

Affected by the outbreak of COVID-19, an online-course learning model was launched for domestic students in the spring of 2020. During this period, due to the signal quality, the learning for students in remote areas was severely affected. The Company responded quickly, secured the signal for students in remote areas to study online courses to actively fulfill its social responsibilities. In Zhen'an, Shaanxi, local students took online courses through simple tents on the hillside 5 kilometers away. To address this situation, the Company completed the construction of a simple tower pole from signal measurement to site selection and construction, which took only 12 days and achieved signal coverage of the 4G network in the whole village through 3 base stations, ensuring the quality of online learning for local students. In Liulin Bay, Qianjiang, Chongqing and other areas located in remote ravines that have a poor network signal, it is difficult to guarantee the quality of online teaching for local students. After learning the news, the Company rushed to the site as soon as possible to quickly develop a construction plan, completed the base station construction and placed the 4G network within 3 days, and sent stationery, gloves, vacuum cups and protective masks to the children.



▲ Construction workers are constructing base stations in mountainous areas

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Communication security for major events

To ensure the successful celebration of the 70th anniversary of the founding of the People's Republic of China, the Company followed the principles of unified leadership, hierarchical responsibility, coordination and rapid response, and adopted the measures of comprehensive risk inspection, strengthening supporting services, and promptly and effectively disposing of equipment to build the related system for the safe operation of equipment and facilities, smooth flow of information, and efficient emergency response. From 8:00 on 29 September to 8:00 on 7 October, all branches in Beijing, Tianjin, Hebei, Shandong, Shanxi, Liaoning, and Inner Mongolia of China Tower jointly secured 39,000 key regional sites, which were under normal operation and did not fail when there were emergencies that affected network security. A total of 3,711 guarantee personnel, 1,821 vehicles and 2,055 oil engines were dispatched in 7 provinces. During the guarantee period, a total of 33,000 guarantee personnel, 16,000 vehicles, and 16,000 generators were dispatched.



▲ Chairman Tong Jilu at the Command and Dispatch Centre

(IV) Enthusiastically Engaged in Volunteer Service

The Company attached great importance to fulfil its social responsibility, encouraged young employees to participate in various volunteer services, and supported the youth to carry out various poverty alleviation activities. In 2019, based on the Volunteer China website and applications, China Tower vigorously launched volunteer activities, promoted the youngsters to participate in volunteer services, and actively advanced the online registration of young volunteers. As of the end of 2019, the Company had registered 2,894 young volunteers and rolled out a total of 863 youth volunteer activities throughout the year, and a total of 8,826 people had participated in various volunteer activities.

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In 2019, starting from its own characteristics, the Company organised volunteers to conduct 1,030 publicity activities such as education on charging safety, information sharing on electromagnetic radiation, battery echelon use, household application of 5G technology, energy conservation and environmental protection, and distributed more than 20,000 publicity materials, covering more than 50,000 people.



▲ Popularisation of electromagnetic radiation

While keeping visiting vulnerable groups such as the isolated elderly and cleaners, the Company expanded its participation in ecological and environmental protection activities, focusing on organising young employees to participate in 43 activities such as garbage sorting, cleaning plateau lakes, and afforestation, conducting periodical volunteer service cooperation with communities and scenic spots, and carried out activities regularly.



▲ Young employees cleaning up river waste

In addition, the Company launched activities to take care of impoverished children, orphans and left-behind children. In 2019, a total of 1,425 young employees participated in related activities and established normalised support relationships with 354 impoverished households and a Hope Primary School. Through the 2019 Youth Federation Supporting Small Wishes Campaign, the Company regularly sent gifts and love to impoverished children orphans. The Company has established partnership with Wangzhai Village Primary School in Zhumadian, Henan Province to donate electrical equipment such as televisions, computers, air conditioners to the campus, equipped each student with stationery, and conducted regular teaching activities, arranging young employees to provide education for the school in turn.



▲ Wangzhai Village Primary School Donation Ceremony

Building a Beautiful China for Harmonious Development

Protecting the Rights and Interests of Employees and Facilitating Employee Development

Sustainable Development Strategy of China Tower

Whether the Company can realise a healthy and sustainable development depends on employees, who are vital assets and core competitiveness of the Company. Our accomplished employees are the source of strength for sustainable and healthy development of the Company. Adhering to a talent-oriented corporate strategy, we proactively protect the rights and interests of employees, care for the physical and mental health of them, help accomplish the development of our employees with continuous initiatives to boost vitality of our organisation, while building a positive and harmonious working atmosphere and sharing achievements with employees.

Actions Taken by China Tower in 2019

Protecting the legitimate rights and interests of employees

- Formulated a sound system to protect the rights and interests of employees
- Adhered to the principle of open and fair in recruitment
- Provided employees with benefits including pension, medical insurance, work-related injury insurance, maternity and unemployment insurance

Caring for the physical and mental health of our employees

- Offered annual physical examinations to all employees
- Covered critical illness insurance for all employees
- Covered accident insurance for all employees
- Organised regular and diversified activities for employees



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Actions Taken by China Tower in 2019

Sound Training System

- Improved the competence of training administrators and internal trainers
- Pushed for the settlement of difficult problems found during previous investigations and those came from the feedback of all sides
- Strove to build a favourable learning atmosphere
- Introduced a credit system to link learning and growth with promotion of the individuals
- Built a company-level training system for internal trainers, recruited and selected 134 junior internal trainers, and completed 134 high-quality internal training courses

Optimising and Innovating the Incentive System

- Established a dual promotion channel system by which the employees can advance themselves through joining the management team or improving their technical skills, providing employees with a multi-channel development path
- Built a reasonable performance management system
- Proactively promoted the improvement of the long-term incentive and restrictive mechanism, and approved the First Phase Restricted Share Incentive Scheme of China Tower Corporation Limited in 2019

Building a Beautiful China for Harmonious Development

(I) Protecting the Legitimate Rights and Interests of Employees

People are the most valuable asset of an enterprise. Being future-oriented and aiming at building a new pattern of talent development, the Company has been operating in strict compliance with the *Labour Law of the People's Republic of China*, the *Labour Contract Law of the People's Republic of China*, the *Social Insurance Law of the People's Republic of China* and other laws and regulations, thereby further optimising the allocation of human resources and the implementation of a talent-driven system.

Employment

Focusing on leading and supporting such development, the Company took pains to build the “three teams”, strengthened the excellent, capable team and promising team with high-calibre management talent. To promote business transformation, we implemented the “One Core, Two Wings” strategy and recruited more core technical staff. In addition, we continued to maintain a capable and efficient team, and intensified training of skilled talents.

The Company formulated the *Interim Measures for the Management of Employee Recruitment of China Tower Corporation Limited* and other recruitment mechanisms to standardise employment practices in a lawful manner. In accordance with laws and regulations, the Company created labour contract templates, entered into labour contracts with employees, and stipulated the responsibilities and rights of both parties in the contracts in terms of remuneration, working hours, termination of employment, etc. with a view to protecting the legitimate rights and interests of employees. Moreover, the Company adhered to the principle of openness and fairness in the course of recruitment, eradicated sexual and ethnic discrimination, as well as refused the employment of child labour.

In 2019, the Company recruited more than 440 new graduates and over 600 from the society. The Company conducted campus recruitment in autumn with the theme of “Devoting Youth to China Tower, Growth with Passion”. With our focuses on the development of the new generation of fresh graduates, we not only provide them with a platform for development and learning, but also care for their development in an all-around way with compensation, various benefits as well as a complete training system, realizing the theme of “Devoting Youth to China Tower, Growth with Passion” in a real sense. We held the campus recruitment at 29 key universities in 16 cities in the autumn of 2019. There were more than 3,000 students attending the job fairs. We received a total of nearly 30,000 resumes on site and online, and our publicity campaigns reached over 400,000 people. Furthermore, the Company was listed in the Top 100 Employers of the Year again.



▲ Scene of campus recruitment in autumn of 2019

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Employment performance table

Indicator		Total (persons)
Total number of employees on a contract basis		18,998
By gender	Male	14,066
	Female	4,932
By age	Aged 29 and under	5,024
	Aged 30-39	8,705
	Aged 40-49	4,750
	Aged 50 and over	519
Employee turnover		312
By gender	Male	201
	Female	111
By age	Aged 29 and under	162
	Aged 30-39	110
	Aged 40-49	37
	Aged 50 and over	3

Remuneration Package

The Company strictly follows the applicable laws and regulations, by means of systems and regulations as well as contract terms, standardising the benefit-related management of working hours, rest and vocation, protecting the legitimate rights and interests of employees on labour remuneration, working hours, breaks and vocation as well as insurance benefits, and guaranteeing that the compensation for all employees are above the minimum wage standard while providing them with pension, medical, work-related injury, maternity and unemployment insurance.

In the meantime, China Tower takes initiatives to provide employees with more benefits, including setting up a nursery room for female employees during the lactation, offering employee benefits such as maternity leave and childbirth allowance, and strengthening the care and protection for female employees during specific periods. Additionally, the Company established a corporate annuity plan to enhance the quality of life for employees after retirement.

In 2019, the labour union of the Company organised employee activities in which all participated during three major holidays, namely Dragon Boat Festival, Mid-Autumn Festival and New Year's Day. In addition, China Tower organised a tea party to welcome new hires, fun sports events and hiking. To celebrate the 70th Anniversary of the Founding of the People's Republic of China, the labour union of the Company organised a photography and a writing contest with the theme of "Presence of China Tower, New Era of Construction Engineering". Diversified employee activities enriched the cultural and sports life of employees and improved teamwork.

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(II) Caring for the Physical and Mental Health of Employees

In strict accordance with the applicable laws and regulations including the *Labour Law of the People's Republic of China* and the *Law of the People's Republic of China on the Prevention and Control of Occupational Diseases*, the Company takes care of the physical and mental health of employees, supplies employees with a safe and comfortable working environment, and encourages employees to balance life and work.

The Company furnishes employees with medical and work-related injury insurance. It offers annual physical examinations to all employees, and provides tailor-made physical examinations possible after survey of intention among employees, to make sure that employees fully understand their own physical conditions, thereby protecting the health and safety of employees. The Company provides critical illness insurance for all employees, where 35 critical illnesses including malignant tumour, myocardial infarction, Alzheimer's and end-stage renal disease are covered. As such, the high medical expenses of employees paid for illness, morbid state or surgery can be reduced to some extent, and economic compensation can be rendered to the insured after illness to prevent the family of the insured from being trapped in financial difficulties as far as possible.

The Company also cares for the mental health of employees and protect their mental health by organising diversified cultural and sporting activities on a regular basis. In 2019, on behalf of China Tower, the football team of the headquarters and that of Shandong branch took part in the "2019 Five-Player Football Game for Employees of Telecommunications Enterprises in China", where the team of Shandong branch performed well and won the eighth place while the team of the headquarters took the twelfth place and the Fighting Award.



▲ Group photo of the football teams of the headquarters and Shandong branch after the game

Building a Beautiful China for Harmonious Development

(III) Implementing a Talent-oriented Corporate Strategy

The Company upholds the concept of “Development as the Top Priority and Talents as Primary Resources” and implements a talent-oriented corporate strategy, proactively promoting capability enhancement and talent training. Through measures such as post certification, target-achieving training, job rotation, employees’ horizon can be broadened, knowledge and skills advanced, and overall quality enhanced in an all-round manner, thereby we can really have a skilled technical talent team who are both knowledgeable and good at innovation. Meanwhile, the Company reinforces incentives to motivate the team, further increases spiritual incentives and enhances the incentives for core talents to fuel their motivation for innovation and boosts their vigour for development, striving to achieve a win-win situation between the Company and employees.

The Company bases itself on employee development, establishing a training system to launch comprehensive training for managers, technical personnel and frontline staff at different levels and holding different jobs. In 2019, the Company further improved the training system by enriching contents of the training and innovating the training format, in an effort to effectively enhance the level of training management. In respect of system building, considering the current situation, we emphasised on strengthening the implementation of systems related to training management, project implementation, resource utilisation, professional skills and job certification. In terms of platform building, we continued to optimise system functions of the “online learning” platform. In regard to team building, we motivated training administrators and internal trainers to upgrade their professional skills, guaranteeing that various training projects and learning activities can be rolled out smoothly. As for the coordination mechanism, human resource department of our headquarters, took the lead to coordinate resources based on the pain points in previous investigation and feedback from all sides, built the platform for communication and cooperation, and pushed for the settlement of the common issues reflected in the feed-back of different provincial branches. As for atmosphere building, we created a favourable learning atmosphere while introducing a credit system and positive incentives like linking learning and growth with individual promotion to motivate the learning of employees, whereby gradually establishing an open, positive and progressive learning culture.

In 2019, the Company built a training system for internal trainers and an internal training course system, recruited and selected 134 junior internal trainers, and completed 134 top-notch internal training courses. In addition, the Company is committed to building “Headquarters Lecture Hall”, an internal learning brand representing such online and offline courses as document writing, 5G technology, stress management and professional skill development, covering more than 6,000 employees in total.

Building a Beautiful China for Harmonious Development

(IV) Optimising and Innovating the Incentive System

Taking job value as the core and regarding performance and capability enhancement as the orientation, the Company determines the levels and compensations of employees according to their job value, performance, capability and quality. We provide employees with multiple development paths to enlarge the room for their development and implement a dynamic management mechanism where both promotion and demotion are possible, in order to attract, motivate and retain talent in an effective way.

In order to facilitate employee development, the Company has established a dual promotion channel system by which the employees can advance themselves through joining the management team or improving their technical skills, building a platform for employees to exploit their talent and realise their own value to the greatest extent and meet the development needs of employees with different professional interest, capability and quality. In the meantime, employees can clearly know the promotion rules and plan their development paths in this way, so as to build a favourable people-centered climate where employees at all levels can grow together in order to make continuous improvement and growth.

As regard to employee performance management, the Company has built a scientific performance management system with the goals of realising enterprise strategies, improving organisational performance and putting operating risks under control. With an emphasis on whole-process performance management, the Company advocates instant communication and cooperation and timely evaluation, so as to stimulate the enthusiasm, initiative and creativity of employees as well as give full play to the guiding role of managers, making performance management an effective tool for the Company to implement strategies and enhance employees' capability. In 2019, the Company proactively promoted the improvement of the long-term incentive and restriction mechanism by means of implementing the Restricted Share Incentive Scheme and granting Restricted Shares under the Restricted Share Incentive Scheme from time to time, to trigger the potential and vigour of the talents. There are strict supporting assessment methods and shares granted in tranches in the Incentive Scheme to deliver a fair and impartial process.

Prospects for Sustainable Development

Currently, the world is undergoing the fourth industrial revolution mainly featured by digitisation, networking and intelligence. As the 5G technology and network move on, information communications, as a key infrastructure to underpin the digital transformation of economy and society, will bring about a burst of innovation and usher in a new digital era making breakthroughs with accelerating advancement.

2020 is the final year for the building of a moderately prosperous society in an all-around way and of the “13th Five Year” Plan, the year to prepare for the “14th Five Year” Plan, as well as a key year for China Tower to promote business transformation, strengthen the “One Core, Two Wings” strategy and support the large-scale commercialisation of 5G services. Standing at a new milestone, we have set a stronger development foundation and are seeing more development opportunities as never before. We will continue to well play the roles of a national team and main force in the construction of telecommunications infrastructure under such trends of the times as 5G technology, network development, digital economy, sharing economy and green economy. We will make continuous progress and greater contributions to the promotion of Cyberpower, Digital China and smart society along with customers and the industry chain.



Prospects for Sustainable Development

In 2020, we will further promote the concepts of sharing and synergetic development, coordinate to utilise our existing site resources and social resources to save costs and investment and support the commercialisation of 5G. We will also explore more cross-sector resource-sharing and informatization services and energy socialisation services to better serve the national economy and the people's livelihood. In addition, we will continue to strengthen research and development for technical and business innovation, widen the application of innovative products, and further lift the operation management efficiency. Moreover, we will provide quality services, enhance the guarantee for operation and maintenance, optimise the customer service response system, and further improve the emergency response and communication support capability. Furthermore, we will continue to improve the corporate governance, perfect the construction of various systems, and lay a solid management foundation. Aside from that, we will push forward the implementation of the objectives on energy conservation and emission reduction of the Company, further improve energy efficiency with green energy-saving and big data technologies, and take initiatives to adopt tower structure and construction plans appropriate for the environment, aiming at making contributions to the building of a resource-conservation and environmentally-friendly society. In addition, we will continue to promote the construction of a telecommunication network in western regions and remote areas, keep narrowing the "digital gap", conscientiously take actions on targeted poverty alleviation and perform corporate social responsibility. Last but not least, we will continue to take care of employee development, implement the talent-oriented corporate strategy, improve training systems, and constantly find new growth drivers for the Company.

In 2020, upholding the concept of sustainable development and adhering to the "One Core, Two Wings" strategy, we will promote business transformation, strengthen the market-oriented principle, enhance competitiveness, underpin existing businesses as well as improve quality and efficiency, to achieve high-quality development, accelerate the building of an enterprise with the highest potential for both growth and value creation, and build a better future for sustainable development together with the stakeholders.

Appendix: Index List

(I) Index List of ESG Reporting Guide

Scope	Subject	Performance indicators	Chapters
Environmental	A1 Emissions	General Disclosure: Information on: (1) the policies; and (2) compliance with relevant laws and regulations that have a significant impact on the issuer in terms of air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste.	Putting green concept into practice to promote sustainable development
		A1.1 The types of emissions and respective emissions data.	Putting green concept into practice to promote sustainable development
		A1.2 Greenhouse gas emissions in total (in tonnes) and, where appropriate, intensity (e.g. per unit of production, per facility).	Putting green concept into practice to promote sustainable development
		A1.3 Total hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production, per facility).	Putting green concept into practice to promote sustainable development
		A1.4 Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production, per facility).	Putting green concept into practice to promote sustainable development
		A1.5 Description of measures to mitigate emissions and results achieved.	Putting green concept into practice to promote sustainable development
		A1.6 Description of how hazardous and non-hazardous wastes are handled, reduction initiatives and results achieved.	Putting green concept into practice to promote sustainable development

Appendix: Index List

Scope	Subject	Performance indicators	Chapters
Environmental	A2 Use of Resources	General Disclosure: Policies on the efficient use of resources, including energy, water and other raw materials.	Putting green concept into practice to promote sustainable development
		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, per facility).	Putting green concept into practice to promote sustainable development
		A2.2 Water consumption in total and intensity (e.g. per unit of production, per facility).	Putting green concept into practice to promote sustainable development
		A2.3 Description of energy use efficiency initiatives and results achieved.	Putting green concept into practice to promote sustainable development
		A2.4 Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency initiatives and results achieved.	Putting green concept into practice to promote sustainable development
		A2.5 Total packaging material used for finished products (in tonnes) and, if applicable, with reference to per unit produced.	Not applicable to businesses of the Company
	A3 The Environment and Natural Resources	General Disclosure: Policies on minimising the listed company's significant impact on the environment and natural resources.	Building a cyberpower through sharing and win-win cooperation; Adhering to innovation-driven development to improve operations management efficiency; Putting green concept into practice to promote sustainable development
		A3.1 Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	Building a cyberpower through sharing and win-win cooperation; Adhering to innovation-driven development to improve operations management efficiency; Putting green concept into practice to promote sustainable development

Appendix: Index List

Scope	Subject	Performance indicators	Chapters
Social	B1 Employment	General Disclosure: Information on: (1) the policies; and (2) compliance with relevant laws and regulations that have a significant impact on the listed company relating to compensation and dismissal, recruitment and promotion, working hours, breaks, equal opportunity, diversity, antidiscrimination, and other benefits and welfare.	Protecting the rights and interests of employees and facilitating employee development
		B1.1 Total workforce by gender, employment type, age group and geographical region.	Protecting the rights and interests of employees and facilitating employee development
		B1.2 Employee turnover rate by gender, age group and geographical region.	Protecting the rights and interests of employees and facilitating employee development
	B2 Health and Safety	General Disclosure: Information on: (1) the policies; and (2) compliance with relevant laws and regulations that have a significant impact on the listed company relating to providing a safe working environment and protecting employees from occupational hazards.	Enhancing service quality and production safety to provide premium service
		B2.1 Number and rate of fatalities.	–
		B2.2 Lost days due to work injury.	–
		B2.3 Description of occupational health and safety measures adopted, and how they are implemented and monitored.	Protecting the rights and interests of employees and facilitating employee development
	B3 Development and Training	General Disclosure: Policies on improving employees' knowledge and skills for discharging duties at work.	Protecting the rights and interests of employees and facilitating employee development
		B3.1 The percentage of employees trained by gender and employee category (e.g. senior management, middle management).	–
		B3.2 The average training hours completed per employee by gender and employee category.	–

Appendix: Index List

Scope	Subject	Performance indicators	Chapters
Social	B4 Labour Standards	General Disclosure: Information on: (1) the policies; and (2) compliance with relevant laws and regulations that have a significant impact on the listed company relating to preventing child and forced labour.	Protecting the rights and interests of employees and facilitating employee development
		B4.1 Description of measures to review employment practices to avoid child and forced labour.	Protecting the rights and interests of employees and facilitating employee development
		B4.2 Description of steps taken to eliminate such practices when discovered.	Protecting the rights and interests of employees and facilitating employee development
	B5 Supply Chain Management	General Disclosure: Policies on managing environmental and social risks of the supply chain.	Strengthening compliance operations to improve risk control capability
		B5.1 Number of suppliers by geographical region.	Strengthening compliance operations to improve risk control capability
		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.	Strengthening compliance operations to improve risk control capability
	B6 Product Responsibility	General Disclosure: Information on: (1) the policies; and (2) compliance with relevant laws and regulations that have a significant impact on the listed company relating to health and safety, advertising, labelling and privacy matters relating to products and services provided and methods of redress.	Enhancing service quality and production safety to provide premium service
		B6.1 Percentage of total products sold or shipped subject to recalls for safety and health reasons.	Enhancing service quality and production safety to provide premium service
		B6.2 Number of products and service-related complaints received and how they are dealt with.	Enhancing service quality and production safety to provide premium service

Appendix: Index List

Scope	Subject	Performance indicators	Chapters
Social	B6 Product Responsibility	B6.3 Description of practices relating to observing and protecting intellectual property rights.	Strengthening compliance operations to improve risk control capability
		B6.4 Description of quality assurance process and recall procedures.	Enhancing service quality and production safety to provide premium service
		B6.5 Description of consumer data protection and privacy policies, how they are implemented and monitored.	Strengthening compliance operations to improve risk control capability
	B7 Anti-corruption	General Disclosure: Information on: (1) the policies; and (2) compliance with relevant laws and regulations that have a significant impact on the listed company relating to bribery, extortion, fraud and money laundering.	Strengthening compliance operations to improve risk control capability
		B7.1 Number of concluded legal cases regarding corrupt practices sued against the listed company or its employees during the reporting period and the outcomes of the cases.	–
		B7.2 Description of preventive measures and whistle-blowing procedures, and how they are implemented and monitored.	Strengthening compliance operations to improve risk control capability
	B8 Community Investment	General Disclosure: Policies on community engagement to understand the needs of the communities where the listed company operates and to ensure its activities take into consideration the communities' interests.	Contributing proactively to the society while fulfilling corporate responsibility
		B8.1 Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport).	Contributing proactively to the society while fulfilling corporate responsibility
		B8.2 Resources contributed (e.g. money or time) to the focus area.	Contributing proactively to the society while fulfilling corporate responsibility

Appendix: Index List

(II) SDG Index List

Performance indicators	Practices of China Tower	Chapters
Goal 1: No poverty	Promoting work in assisting partners and targeted poverty alleviation, undertaking poverty alleviation programs in telecommunications, industry, consumption, and other areas, and rallying all possible social forces to participate in poverty alleviation donations to help impoverished households gradually get out of poverty.	Contributing proactively to the society while fulfilling corporate responsibility
Goal 2: Zero hunger	Providing information products and innovative solutions based on cross-sector resource-sharing to facilitate agricultural development, thereby helping farmers increase their production and income and boosting local economic development.	Serving digital economy with cross-sector resource sharing; Contributing proactively to the society while fulfilling corporate responsibility
Goal 3: Good health and well-being	Driving registered and archived impoverished people out of poverty to improve their quality of life; ensuring safety in production to avoid safety accidents; and offering medical check-ups to all employees and promoting their physical well-being.	Contributing proactively to the society while fulfilling corporate responsibility; Enhancing service quality and production safety to provide premium service; Protecting the rights and interests of employees and facilitating employee development
Goal 4: Quality education	Donating teaching facilities to primary schools in impoverished regions, encouraging employee volunteers to participate in education assistance activities targeted at poverty alleviation, and improving school education in impoverished regions by offering access to a richer selection of education and teaching resources.	Contributing proactively to the society while fulfilling corporate responsibility
Goal 5: Gender equality	Providing employees with equal employment and training opportunities and a fair work environment, as well as strengthening the protection for the rights and interests of female employees.	Protecting the rights and interests of employees and facilitating employee development
Goal 6: Clean water and sanitation	Advocating water conservation to reduce water use; all wastewater produced from company operations over the year was discharged into the sewage network, and there was no incident of significant impact due to water withdrawal within the Company.	Putting green concept into practice to promote sustainable development
Goal 7: Affordable and clean energy	Establishing new energy base stations which use power of solar, wind and photovoltaic energy.	Putting green concept into practice to promote sustainable development
Goal 8: Decent work and economic growth	Offering integrated solutions for mobile-network coverage to customers to help them minimise costs and enhance efficiency; and providing employees with a robust platform for career advancement and a well-designed vocational training system.	Advocating the sharing philosophy and promoting the development of sharing economy; Putting green concept into practice to promote sustainable development; Protecting the rights and interests of employees and facilitating employee development

Appendix: Index List

Performance indicators	Practices of China Tower	Chapters
Goal 9: Industry, innovation and infrastructure	Promoting energy operation and actively exploring energy socialisation services; and boosting the technological innovation of products and the innovation of management system to better meet the construction requirements and push the industry to minimise costs and enhance efficiency.	Advocating the sharing philosophy and promoting the development of sharing economy; Adhering to innovation-driven development to improve operations management efficiency
Goal 10: Reduced inequalities	Implementing the Universal Telecommunications Service Project to advance network infrastructure construction and information-driven development in rural areas while minimising urban-rural digital gap; pushing society forward with the Company's own development and sharing the development achievements with all stakeholders; providing employees with equal employment and training opportunities and setting up a fair work environment.	Contributing proactively to the society while fulfilling corporate responsibility Protecting the rights and interests of employees and facilitating employee development
Goal 11: Sustainable cities and communities	Developing and promoting information applications, taking initiatives to promote cross-sector businesses, and capitalising on site resources to facilitate intelligent city management and deliver a smarter user experience.	Advocating the sharing philosophy and promoting the development of sharing economy; Adhering to innovation-driven development to improve operations management efficiency
Goal 12: Responsible consumption and production	Advancing cross-sector sharing to extend us from site service provider to a more valuable integrated information service provider; innovating the management system to minimise costs and enhance efficiency of the industry; strengthening customer privacy protection and preventing telecommunications fraud to ensure secure consumption; continuing to optimise the product and service quality evaluation system to improve customer satisfaction; and promoting green operations, and proactively pushing energy conservation and emission reduction in the operation and maintenance of base stations.	Advocating the sharing philosophy and promoting the development of sharing economy; Putting green concept into practice to promote sustainable development; Enhancing service quality and production safety to provide premium service
Goal 13: Climate initiative	Enhancing the sharing within the industry to reduce repeated construction and wasting of resources in the telecom industry; gradually improving the Environmental Management System to oversee all the environmental impacts of the Company; reinforcing R&D of energy conservation technologies and low-carbon applications, and hosting environmental protection awareness campaigns to drive energy conservation and emission reduction in the wider society.	Advocating the sharing philosophy and promoting the development of a shared economy; Adhering to innovation-driven development to improve operations management efficiency
Goal 16: Peace, justice and strong institutions	Consolidating compliance management on all fronts and proactively promoting the anti-corruption work.	Strengthening compliance operations to improve risk control capability



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