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Firmly Committed to
Carrying the
Responsibility of the
People's Livelihood With the

"People's Needs"

in Mind

The country is the people and the people are the country. China Unicom has always adhered to the people-oriented development philosophy, taking improving the well-being of the people and promoting the all-round development of people as the starting point and goal of digital development. It consolidated and expanded the achievements of poverty alleviation and effectively connected it with rural revitalisation, actively conveyed the warmth of charity, promoted the common prosperity of the society, and continuously enhanced the sense of gain, happiness and security of the people. At the same time, we actively implemented the national "dual carbon" requirements to help build a beautiful China. We consolidated the advantages of all parties to engage in "team competition" and form an integrated and open cooperation ecosystem, promoting the common development of the industry chain.

Measures adopted in 2021

- Consolidated and expanded the achievements of poverty alleviation, continued to contribute to the comprehensive rural revitalisation with broadband network covering 327,000 administrative villages.

- Strengthened green management, green production and operation, green industry empowerment. A special fund of RMB130 million was allocated for energy-saving upgrades.

- Integrated advantages of various parties such as industry peers, equipment and terminal suppliers, channel partners, and strategic investors to engage in "team competition".

- Carried out charity donations, deepened universal services, and actively took part in charity and volunteer service to give back to society.

Actions to be taken in 2022

- To vigorously promote the construction of rural revitalisation network and drive rural revitalization with industrial revitalisation.

- To deeply implement carbon peak and carbon neutrality, and drive research, testing and application of new technologies, new equipment and new solutions in energy conservation.

- To deepen cooperation with strategic investors and industry leaders, and achieve win-win cooperation in terms of business, products and capital.

- To systematise the organisation and management of charity volunteer services, standardise team building and normalise activities.
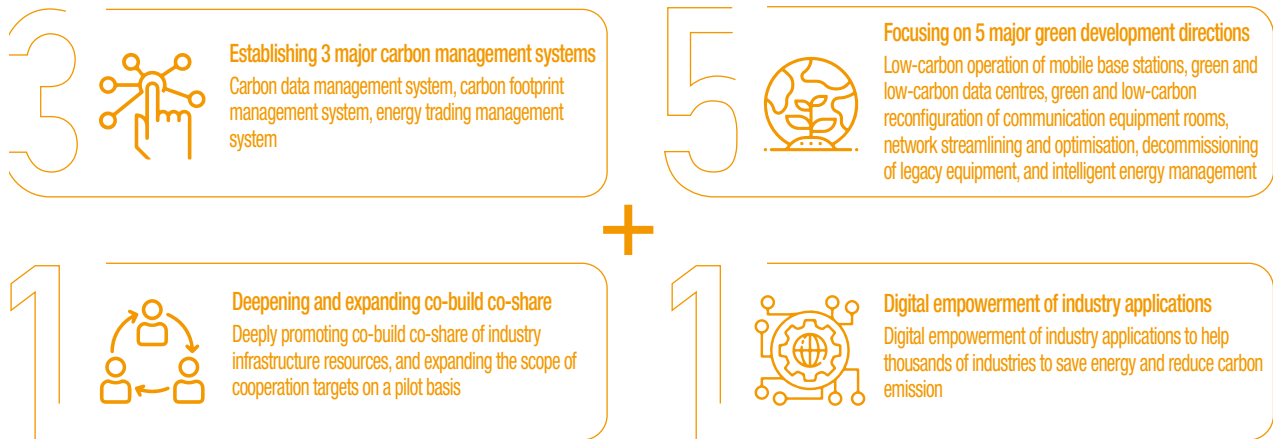
Facilitating the Construction of a Beautiful China

People live up to lucid waters and lush mountains. China Unicom adheres to the concept of green development. It coordinated and promoted green management, network construction, operation and other work, strictly controlled energy consumption intensity and reasonably controlled the total energy consumption. It deeply promoted the green empowerment of industries to facilitate green and low-carbon production, living and governance, thereby contributing to carbon peak and carbon neutrality, and bringing ecological benefits to the people.

Improving the green management system

In compliance with the Environmental Protection Law of the People's Republic of China, the Energy Conservation Law of the People's Republic of China and other laws and regulations related to environmental protection, China Unicom actively responded to the adjustment brought by national climate change. It established the "Carbon Peak, Carbon Neutrality" Management Committee, to guide the establishment and improvement of the Company's "Carbon Peak, Carbon Neutrality" management system, and decide on relevant major work matters. The Management Committee has set up a "Carbon Peak, Carbon Neutrality" management office, which is responsible for research on relevant policies, establishing and improving relevant systems, organising the research and development, testing and promotion of energy-saving and carbon reduction technologies, and organising relevant training, publicity and exchanges, striving to reduce carbon footprint.

The Company formulated and released the "Carbon Peak, Carbon Neutrality" 14th Five-Year Action Plan, and launched the "3 + 5 + 1 + 1" action plan. With the goal of green and low-carbon circular development, the Company comprehensively, systematically and deeply promoted energy conservation and carbon reduction, continuously improved the greenness of communication network infrastructure, and helped bring the green and low-carbon development of the industry to a new level. It made a positive contribution to the country's 2030 targets to increase the proportion of non-fossil energy consumption to about 25%, and to reduce the carbon dioxide emissions per unit of GDP by more than 65% as compared with 2005.

3 **Establishing 3 major carbon management systems**
Carbon data management system, carbon footprint management system, energy trading management system

5 **Focusing on 5 major green development directions**
Low-carbon operation of mobile base stations, green and low-carbon data centres, green and low-carbon reconfiguration of communication equipment rooms, network streamlining and optimisation, decommissioning of legacy equipment, and intelligent energy management

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1 **Deepening and expanding co-build co-share**
Deeply promoting co-build co-share of industry infrastructure resources, and expanding the scope of cooperation targets on a pilot basis

1 **Digital empowerment of industry applications**
Digital empowerment of industry applications to help thousands of industries to save energy and reduce carbon emission

Details of the "3 + 5 + 1 + 1" action plan for carbon peak and carbon neutrality

Enhancing green production and operation

Promoting green and low-carbon production

China Unicom actively promoted the intelligent transformation, energy-saving innovation and green upgrade of communication infrastructure to improve comprehensive energy utilisation efficiency. The Company enforced strict control from the source of equipment procurement, implemented energy-saving responsibilities, put forward energy-saving KPI requirements, and allocated RMB130 million of special fund for energy-saving transformation.

• **Promoting 5G energy-saving technology.** The Company conducted in-depth research on key technologies for 5G energy conservation, installed small air-conditioning and energy-saving equipment such as fresh air, and made full use of clean energy, appropriate hibernation, time-specific shutdown and other measures to reduce the high energy consumption of 5G. Based on the concept of green environmental protection, the Company built the "4G/5G collaborative intelligent energy-saving management platform" to achieve intelligent coordination of multi-mode network and differentiated energy-saving management with "one policy for one station", so as to promote the sustainable development of communication networks in a green, efficient and intelligent manner.

• **Building green data centres.** The newly-built communication equipment room (including data centres) strictly followed the requirements of the national and local industry authorities on environmental impact assessment and environmental protection acceptance. The Company introduced high-voltage direct current and municipal direct power supply technology, simplified the power supply system, optimised the air flow organisation of equipment rooms, and made full use of natural cold sources, air conditioning atomisation, closed cold and heating channels and other means to reduce power supply loss and improve cooling efficiency.

• **Promoting the optimisation and upgrading of production capacity.** 114 sets of MGW equipment for core network were decommissioned. 40 sets of PSTN equipment and 27 sets of NGN equipment for integrated access network were decommissioned. Approximately 45,000 ports of outdated MSTP/SDH equipment and approximately 897 ports of outdated WDM equipment were retired from the transmission network, with a completion rate of 187%. 62 sets of DCN backbone equipment for data network were decommissioned. The Company continued to retire aging equipment for ancillary infrastructure, saving electricity costs of approximately RMB23.95 million for the year.

• **Strengthening the management of electromagnetic radiation.** In the construction of mobile communication base stations, the Company strengthened the management of electromagnetic radiation of base stations to ensure that the electromagnetic radiation of base stations met the requirements of national standards. After the completion of base station construction, base stations were tested for electromagnetic radiation, and the test data were disclosed to the public on the web for public supervision.

Energy-saving technology coverage rate of base stations
75%

Energy-saving technology coverage rate of core equipment rooms (including IDC)
85%

China Unicom Guangdong Branch conducted its work with a view to achieving dual carbon goals. During the year, by simplifying the network, eliminating legacy capacity, carrying out technical energy conservation and power tariff reduction, and reconfiguring its green and low-carbon equipment rooms, China Unicom Guangdong Branch reduced energy consumption costs by RMB41.44 million, saving 5,100 tons of standard coal.

Carrying out green and low-carbon equipment room reconfiguration

In May 2021, the "4G/5G Collaborative Intelligent Energy Saving Management" of China Unicom Research Institute project won the WSIS ICT Electronic Environment Group Champion Award.

"4G/5G Collaborative Intelligent Energy Saving Management" Project Award Certificate

China Unicom Digital Technology Co., Ltd. focused on the construction of a low-carbon data centres. By using energy-saving technologies and operating measures such as natural cold source, equipment dynamic frequency adjustment control, UPS operation mode, etc., we achieved power saving of approximately 9,974,000 kWh and reduced 9,943.7 tons of carbon dioxide emissions. In the feasibility study for data centre construction projects, energy saving solutions were prepared. We actively introduced renewable energy on a pilot basis to meet ancillary office energy consumption and increased the usage mix of green electricity through market-based transactions. Langfang and Hohhot data centres were rated for 5 consecutive years as the "Advanced Unit of Energy Conservation and Emission Reduction" Guian and Hohhot data centres were included in the National Green Data Centres List.

Guian Data Centre was included in the National Green Data Centres List

Promoting green and low-carbon operation

China Unicom actively carried out green office, green product design and business services, built a green supply chain system, and deepened resource recycling.

• **Practicing green office.** The Company unswervingly implemented the concept of "green office", adopted high-efficiency energy-saving and environmental-friendly products and built resource-saving and environment-friendly office buildings around office air conditioners, building elevators, office lighting, employee canteens and other office and living scenarios. We have formulated special measures for vehicle fuel saving and consumption reduction, and timely scrapped vehicles that had reached the end of life, failed to meet environmental standards, and had high consumption of fuel and material maintenance. The Company continued to promote the digital operation of business outlets, actively guided users to sign up services online, and realised digital operation and paperless signups.

• **Reasonable use of water resources.** Strictly complying with the relevant requirements of the "Water Law of the People's Republic of China" and the "Water Pollution Prevention and Control Law of the People's Republic of China", we strengthened daily water conservation management, and improved the reuse of water resources from trivial issues, such as using surplus water for cleaning, dust removal or watering, collecting rainwater for outdoor green space irrigation. We strengthened equipment maintenance and inspection to avoid leakage. The Company's daily office and production and operation water is mainly sourced from municipal unified water supply, and there is no risk of water pollution.

• **Building a green supply chain.** The Company issued the Notice on China Unicom Strengthening the Independent and Controllable Supply Chain and Encouraging the Development of Green and Low-Carbon Procurement, and separately set out green and low-carbon requirements in the centralised procurement of 5G and other network equipment to increase the weight of energy-saving KPIs. We required suppliers to provide products that meet the requirements of green packaging, not to use toxic and hazardous substances as packaging materials, and to use recyclable, degradable or harmless packaging materials to avoid excessive packaging.

• **Strengthening recycling.** The Company established an internal revitalisation mechanism for idle materials based on fair market value, and the accumulative revitalisation and allocation of materials amounted to RMB78 million. Public auctions for disposed assets were held through online auction platforms. The transaction value amounted to RMB456 million, of which retired batteries accounted for RMB122 million and other scrapped materials accounted for RMB334 million.

• **Carrying out green publicity.** By fully leveraging activities such as the National Energy Conservation Publicity Week and the National Low-carbon Day, the Company organised energy conservation publicity activities both online and offline, and educated and guided employees to practice green consumption and low-carbon lifestyle, so as to improve the awareness of energy conservation, emission reduction and environmental protection of all employees, and create a new fashion of green and low-carbon life.

China Unicom innovated the "volunteer revitalisation" working model and launched volunteer revitalisation team to reallocate idle information terminals in good operating condition to improve the office terminal configuration of front-line personnel in economically backward areas and disaster-hit areas. In 2021, the total scale of information terminal revitalisation reached RMB20.11 million, including 905 computers, as well as certain printers, scanners, servers, switch and other terminal equipment, for a total of 1,202 terminals.

China Unicom Beijing Branch has formulated energy-saving plans, energy-saving initiatives and implementation plans for water, heating and electricity. It refined energy consumption ledger of water, heating and electricity, implemented green network operations and promoted energy conservation and consumption reduction in office premises. In accordance with the Green Logistics Action Plan of China Unicom Beijing Branch, it actively promoted group logistics express open market application and assisted related units to put more than 300 idle assets and materials such as tables and chairs on the shelves of second-hand shops.

🏭 Strengthening green empowerment of industries

China Unicom gave full play to its technological advantages in 5G, cloud computing, Big Data, Internet of Things and AI, focused on key scenarios such as carbon emission reduction, smart water conservancy and environmental monitoring, developed green and intelligent application products, and launched informatised green solutions to empower the green transformation and upgrade of thousands of industries.

Building "Dual Carbon Cloud" intelligent products. We built a "dual-carbon" Big Data platform to form a general capability foundation. We strengthened the development of carbon emission management software to realise the functions of carbon emission quantification, analysis, management and reporting. The Company built an application centre to support the access of various double-carbon applications, and closely integrated with the power, industry, construction, steel, transportation and other industries to improve low-carbon management. We built a unified dual-carbon data resource system, innovated the dual-carbon management decision-making service model, and improved the dual-carbon indicator system and evaluation system.

"Zero Carbon" Asian Games Energy Internet Model

China Unicom Zhejiang Branch built a 5G power virtual private network for State Grid Hangzhou Power Supply Company, empowering the creation of a "zero-carbon" Asian Games energy Internet model. The investment in communication and optical cables decreased by RMB60 million, and the average annual power outage time decreased by 42%, and it was expected to reduce carbon dioxide emissions by 550,000 tons in the year.

Innovating smart water conservancy solutions. Focusing on key areas such as water resource development and utilisation, flood and drought prevention, rural water conservancy, water ecology, and water environment, we promoted the modernisation of water governance system and water governance capabilities, created smart water conservancy with thorough perception, comprehensive interconnection, in-depth exploration, intelligent application, and ubiquitous service, and realised the whole-process intelligent management and control of water-related events perception, supervision and decision-making.
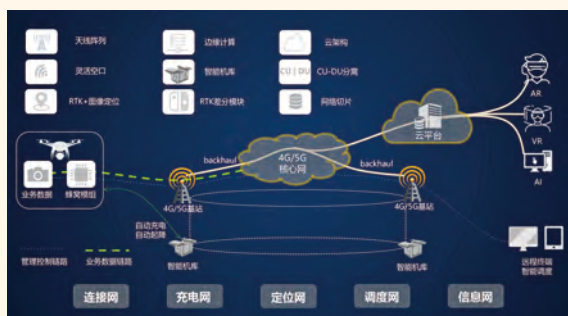
5G + UAV river patrol technology architecture

China Unicom Fujian Branch earnestly implemented the new positioning of the Ministry of Water Resources on the national water conservancy work deployment, innovatively created a river and lake chief system and smart water conservancy demonstration benchmark, assisted in the digital transformation of water conservancy, realised resource integration, improved work efficiency, and reduced social management costs, which were highly praised by all sectors of society. The platform has served more than 20,000 river chiefs, river chief officers, special management officers and the general public, supporting more than 2.4 million river patrol services every year and handling more than 200,000 river and lake incidents.

Launching the environmental monitoring program of "one network with unified management". Focusing on the comprehensive supervision of ecological environment, ecological environment Big Data and other fields, the Company created solutions such as "China Unicom Ecological Environment Big Data Platform" and "Classification of Domestic Waste of Urban Residents", and implemented the comprehensive management system of ecological environment inspection and the "one network with unified management" project of ecological environment in Xiong'an, Shandong, Zhejiang, Shanghai and other provinces and cities to achieve cross-departmental, cross-level and cross-regional ecological environment data sharing, and realise digital, convenient and accurate management.

Demonstration of Ecological Environment Smart Monitoring System in Xiong'an New Area

Relying on its technological capabilities with independent innovation, China Unicom integrated 5G applications, remote sensing, ecological data standardisation, data governance, environmental monitoring IoT, edge cloud and other capabilities, to independently develop a smart ecological environment platform, achieving 5G full-scenario coverage of smart monitoring of ecological environment in Xiong' an New Area. It built an integrated ecological environment smart monitoring system of "Tiandidian" and improved the alert and early warning, informatisation and protection of ecological environment monitoring.

Promoting Comprehensive Rural Revitalisation

2021 is a year when China achieved a comprehensive victory in poverty alleviation and successfully started to implement the strategy of rural revitalisation. The rural revitalisation strategy is a comprehensive and historic task related to the construction of a modern socialist country in an all-round way, and is the general focus of "Agriculture, Rural Areas and Farmers" work in the new era. Rural revitalisation must be pursued before national rejuvenation. China Unicom resolutely implemented the requirements of "four things not to remove", effectively enhanced the sense of mission and responsibility of helping rural revitalisation, ensured that work was not reduced, capital investment was not reduced, policy support was not reduced, and the strength of assistance was not reduced. It took multiple measures and made continuous efforts to comprehensively promote rural revitalisation and consolidate and expand the achievements of poverty alleviation.

Improving our position and coordinating rural revitalisation

China Unicom further optimised and sorted out the three major systems formed by the Group in poverty alleviation, namely the Work System for Big Poverty Alleviation, the Responsibility Division System for Targeted Poverty Alleviation and the Work System for Promoting Poverty Alleviation with Industrial Development as the Core, which continued to serve as the basic system and work requirements for supporting rural revitalisation.

Completed the rotation of temporary cadres, the first secretary of the village and the members of the working team in the village of
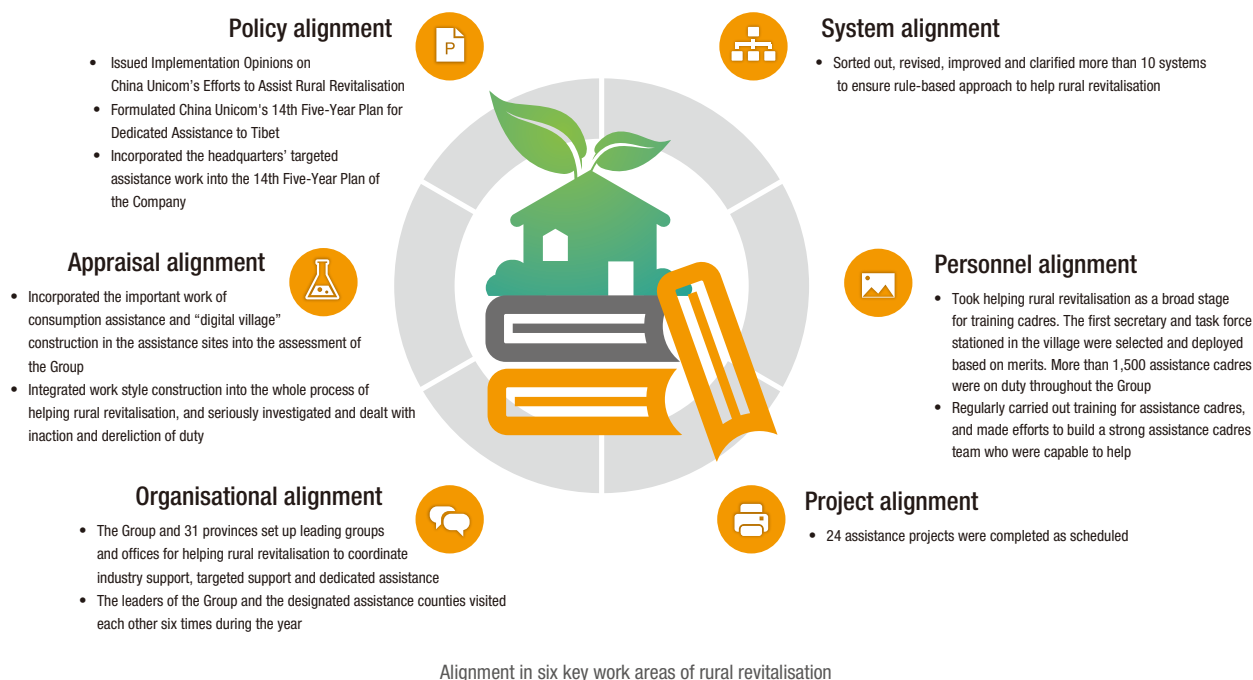
1,493 people

On 25 February 2021, the National Poverty Alleviation Summary and Commendation Conference was held at the Great Hall of the People. China Unicom Poverty Alleviation and Dedicated Tibet Aid Leadership Group was awarded "National Advanced Group for Poverty Alleviation".

Targeted poverty alleviation work won the title of "National Advanced Group for Poverty Alleviation"

Through the coordination of six tasks, including policies, systems, personnel, projects, organisations and appraisal, the Company provided all-round support for the in-depth, practical and successful rural revitalisation. We strengthened typical guidance, built a "publicity team" for rural revitalisation, created a good atmosphere, and guided more cadres and employees to pay attention to rural revitalisation, participate in rural revitalisation, and help rural revitalisation.

Policy alignment

- Issued Implementation Opinions on China Unicom's Efforts to Assist Rural Revitalisation
- Formulated China Unicom's 14th Five-Year Plan for Dedicated Assistance to Tibet
- Incorporated the headquarters' targeted assistance work into the 14th Five-Year Plan of the Company

System alignment

- Sorted out, revised, improved and clarified more than 10 systems to ensure rule-based approach to help rural revitalisation

Appraisal alignment

- Incorporated the important work of consumption assistance and "digital village" construction in the assistance sites into the assessment of the Group
- Integrated work style construction into the whole process of helping rural revitalisation, and seriously investigated and dealt with inaction and dereliction of duty

Personnel alignment

- Took helping rural revitalisation as a broad stage for training cadres. The first secretary and task force stationed in the village were selected and deployed based on merits. More than 1,500 assistance cadres were on duty throughout the Group
- Regularly carried out training for assistance cadres, and made efforts to build a strong assistance cadres team who were capable to help

Organisational alignment

- The Group and 31 provinces set up leading groups and offices for helping rural revitalisation to coordinate industry support, targeted support and dedicated assistance
- The leaders of the Group and the designated assistance counties visited each other six times during the year

Project alignment

- 24 assistance projects were completed as scheduled

Alignment in six key work areas of rural revitalisation

We carried out two on-site training courses on "Digital Village" for assistance cadres and relevant personnel of the rural revitalisation offices nationwide, and uploaded the training courses to China Unicom Online College. A total of more than 5,000 assistance cadres were trained online and offline.

Universal service for building information highway in rural areas

Everything we do is for the needs of the public. China Unicom overcame difficulties such as tough construction environment, difficult construction and long distance, and built an information highway for villages and remote areas to bring information benefits to people.

• The Company vigorously promoted the construction of rural revitalisation network, orderly promoted the seventh and eighth batches of pilot projects for rural universal services and the construction of China Unicom's special poverty alleviation network. Broadband covered 327,000 administrative villages, including 244,000 administrative villages in 10 northern provinces, with a coverage rate of 98%.

• We strengthened the construction of network channels in remote poverty-stricken areas to make our services closer to rural life. The number of channels in rural areas and remote poverty-stricken areas reached nearly 230,000.

Base station construction in Wulong poor remote mountainous area

In order to solve the perennial problem of no network signal coverage in the poor and remote mountainous areas of Wulong District, China Unicom Chongqing Branch actively carried out universal telecommunication services and devoted itself to the construction of base stations in mountainous areas. "If there are no lanes, we will carry them by hand; if the mountain is high and steep, we will team up and march together; if the road is slippery, we will stay in the station to seize the construction period." It fully completed and opened 27 base stations to achieve full coverage of 4G network, and paved a smooth information road for the local people with the original mission of post and telecommunications people.

Qianliyan Island is the farthest island of the Yellow Sea waters of Shandong Province from the mainland. The natural environment is harsh with no mobile network signal, and the daily necessities are extremely scarce. The Qianliyan lighthouse on the island has been in operation for 77 years, and the only way of entertainment for lighthouse workers was to watch satellite television. In order to solve the "last kilometer" problem in the communications of Qianliyan Island, 12 construction personnel of China Unicom Qingdao Branch embraced difficulties and stayed on the island for 18 days to carry out construction, covering the surrounding 30 kilometers of sea area with 4G network and voice calls. China Unicom staff realised the dream of "making the century-old navigation channel lighthouse and modern communication technology come together", so that the island is no longer isolated and family bonds are no longer cut off.
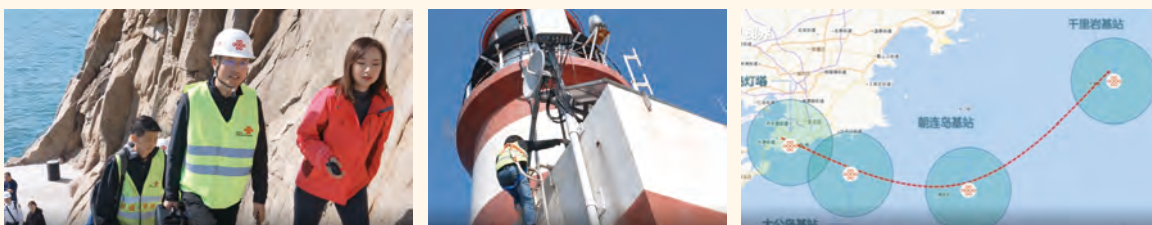
Base Station Construction at Qianliyan Lighthouse

Enriching people by industry and broadening the channels for farmers to increase income

The key to agricultural and rural work is to increase farmers' income in essence. Industrial revitalisation is the material foundation for rural revitalization. Industrial poverty alleviation is the way out, and finding the right path is essential for further promoting rural revitalisation.

Creating advantages in featured agricultural products

China Unicom continued to carry out targeted assistance, actively penetrated into the front line, and cultivated new industries and new business models based on the local actual circumstances, so as to help farmers further expand income channels.

Ceheng County Glutinous Rice Banana Plantations

China Unicom Guizhou Branch continued to carry out rural revitalisation, assisted 1 county (Ceheng) and 20 villages in a targeted manner, dispatched 23 cadres for rural revitalisation. It prepared the "14th Five Year" Ceheng industrial assistance plan to provide financial support for further consolidating and expanding poverty alleviation results. In November 2021, the National Rural Revitalisation Bureau published the "China Unicom's Support for Ceheng County to Build a Whole Industry Chain Development Landscape of Glutinous Rice Banana", which focused on reporting excellent experience and practices and was promoted to the central designated assistance units and local authorities.

Technician guiding villagers in Dongjiu Village, Xiangxi Prefecture to pick up tea leaves

In order to help the villagers in Dongjiu Village, Xiangxi Prefecture, Hunan Province to lead a good life, China Unicom Hunan Branch, taking into account the characteristics of local soil and suitable crop types, invested RMB2.48 million to build a gold tea industrial park with nearly 800 mu. After the tea trees become mature, more than 50 kilograms of fresh tea leaves can be harvested every mu.

Helping farmers grow crops

Zhang Zehui, the in-village "First Secretary" of China Unicom Hegang Branch in Heilongjiang, led villagers to carry out online sales and picking activities of agricultural products. Through online ordering, direct sourcing from the place of origin, and delivery to home, farmers increased their income by RMB10,000 each year. He coordinated with the County Disabled Persons' Federation for many times, invested RMB60,000 in the village, built six smart greenhouses, and mobilised the disabled poor households to develop the lepista sordida planting industry. With his help and coordination, the village developed a number of poverty alleviation industries. Villagers were able to earn more income, lead a better life and be happier.

Innovating on agricultural products promotion methods

China Unicom vigorously carried out activities such as smart rural red research, promotion of beautiful rural culture and tourism, and live broadcast of agricultural product traceability. In combination with digital rural construction and digital live broadcast technology, China Unicom created a channel for agricultural products to "connect to the Internet" and "upgrade", and accelerated the cultivation of a batch of well-known, high-quality and niche rural e-commerce product brands.

China Unicom Tianjin Branch Agricultural Products Live Streaming

China Unicom Tianjin Branch carried out live broadcast to help rural revitalisation, innovatively created a brand for "live broadcast competition of Tianjin Rural Harvest Festival" and supported the digital transformation of agriculture. The "Unicom KOL" live broadcast studio enriched the sales channels of agricultural products, cultivated the KOL team for live broadcast in rural areas, "enhanced" agricultural brands and reputation, refined the quality of life of people, and won wide recognition from all walks of life.

Building an Integrated and Open Ecosystem

Open cooperation is a historical trend, and mutual benefit and win-win are the expectations of the people. China Unicom has always adhered to the cooperation concept of "mutual consultation, co-build, co-share, co-creation, integration and win-win" and insisted on wider, broader and deeper open cooperation. It created a new ecological system covering the innovation chain, industry chain and value chain, and built a "joint fleet" with partners to achieve complementary advantages and mutual empowerment of all parties, in order to accelerate the integration of factors and resources, and jointly meet the people's ever-growing wonderful digital life.

Launching a new ecological cooperation initiative

The 2021 China Unicom Partners Conference was held on 6 December 2021. The theme of the conference was "Embarking on New Journey and Gathering Momentum for a Better Future". The conference aimed to fully demonstrate the digital technology achievements of China Unicom and its global partners, and jointly draw a blueprint for the development of digital economy. Liu Liehong, chairman of the Company, delivered a keynote speech titled "Anchoring the Main Channel of Digital Economy, Win New Future of Digital World" and released China Unicom's new strategy.

In order to accelerate the construction of a digital ecosystem featuring "diversified co-build, complementary and mutual promotion, cross-domain integration, and coopetition", China Unicom joined hands with friends from all walks of life to create a new model of industrial cooperation and jointly write a new chapter of digital economy with sincerity, open-mindedness and practical actions. We issued three new initiatives:

• Deepening cooperation in the innovation chain and strengthening the national strategic technological power. Adhering to the principle of "open door for innovation, co-creation for win-win", we worked with all parties to carry out more in-depth collaborative innovation and released the "Technological Innovation Cooperation Plan".

• Deepening industry chain cooperation and expanding new space for digital development. We worked together with all parties in the industry for win-win and sharing, fully opened up our capabilities, comprehensively met demands, and efficiently cooperated in planning formulation, business alignment, procurement settlement, model innovation, etc.

• Deepening cooperation in the value chain and better integrating into the new development paradigm. We further strengthened collaboration with industry partners and investors, enhanced factor allocation and support capabilities, and promoted the improvement of the value chain.
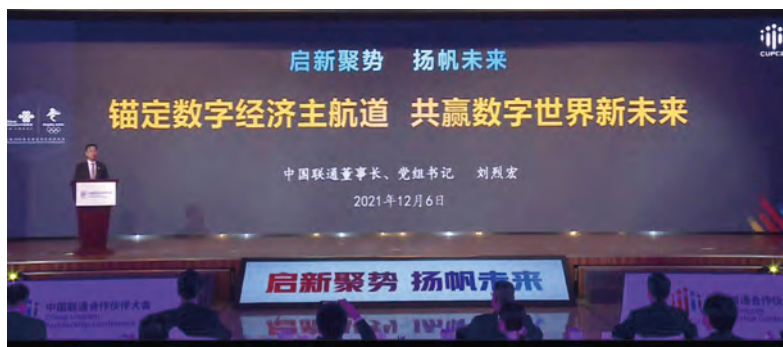
Cooperating with fellow operators for new win-win development

China Unicom conscientiously implemented the deployment of new infrastructure, deepened network co-build co-share, realised the integration of digital information infrastructure resources, protected industry value, promoted sustainable development of the industry, and built a solid digital base for the construction of Cyber Superpower, Digital China and Smart Society.

Promoting co-build co-share in all aspects

The Company continued to promote the co-build co-share of 5G, 4G and basic network resources with China Telecom, and continued to expand the breadth, depth and thickness of the network.

• The scale and coverage of 5G network was comparable to the industry. The two parties jointly built 690,000 5G base stations, covering all urban areas of cities and counties as well as developed towns and above in China.

• The Company actively carried out 4G network co-build co-share and added 1.4 million new 4G shared districts, with the total reaching more than 2 million.

• The Company expanded the scope of cooperation in infrastructure co-build, co-share and co-maintain. It co-built and co-shared more than 400,000 kilometers of trunk lines, optical cables, pole lines and pipelines, saving more than RMB4,000 million investment and RMB200 million maintenance costs per year. The Company further promoted the cooperation in cloud-network integration, communication equipment room, international submarine cable, emergency support and other aspects to realise the synergy potential.

• The Company eliminated the monopoly of broadband in residential and commercial buildings to ensure the simultaneous exercise and fair access of telecommunications infrastructure construction.

Cumulative investment saved through co-build co-share for the country	The operating cost saved exceeded	Emissions reduced
RMB **210** billion	RMB **20** billion/year	**6** million tons

5G construction joint operation system of Heilongjiang branches of China Unicom and China Telecom

China Unicom Heilongjiang Branch and China Telecom Heilongjiang Branch jointly developed a 5G construction operation system. Relying on ultra-high-precision map simulation and Big Data platform resources, the system realised automatic planning, value-accretive network construction, efficient operation and maintenance, and intelligent optimisation for the whole process, driving a new 5G development paradigm with faster construction, higher resource efficiency, better service quality, and more rational coopetition order.

Under the premise of co-build and co-share with China Telecom, the Company actively carried out strategic cooperation in the industry and reached a consensus with State Grid Electric Power, City Investment and Communications Group in sharing resources of pole towers, optical fibre cables and local offices.

5G base station maintenance

China Unicom Henan Branch promoted co-build and co-share of 5G network with China Telecom across the province, and had put into service more than 42,500 5G base stations in total, covering all cities, counties and towns. It actively cooperated with partners to build a series of 5G typical applications, such as the first commercial application of autonomous driving bus line in China, the first 5G + MEC intelligent application in ultra-high voltage power substation in China, and the first 5G pan-low air testing centre in China, providing new momentum for the high-quality development of Henan's economy and society.

The Company unswervingly implemented the requirements of the central government for inspection and rectification, resolutely rectified the vicious competition at the expense of customers' interests and industry value, drove the entire industry to form a benign situation of coopetition, continuously unleashed development dividends, and helped the healthy and sustainable development of the industry. It fully played its role as a "stabiliser and ballast" of national economy, and vigorously promoted the construction of Cyber Superpower, Digital China and Smart Society.

Promoting in-depth cooperation in the industry chain

China Unicom actively worked with all parties to build a safe, innovative, smooth and efficient industrial chain and supply chain, creating value for customers with digital technology, and driving the integration, innovation and coordinated development of the industrial chain.

Deepening cooperation with equipment suppliers

The Company strengthened the standardised management of material procurement, built a digital supply chain platform, and drove equipment suppliers to actively fulfill their social responsibilities.

• **Strengthening standardised management.** All projects subject to tender in accordance with the law conducted public tenders in strict accordance with the requirements of national laws and regulations. For projects not subject to mandatory tender, in accordance with the open procurement principle of the SASAC, the Company innovated on transaction tools such as open selection and open direct purchase, and selected qualified suppliers through the supply chain platform. The entry barrier for suppliers was lowered and the product technology qualification system was widely adopted, so that small suppliers could participated in procurement activities fairly. China Unicom conducted credibility reviews for enterprises in tendering and procurement activities, and prohibited rule-violating enterprises from participating in tenders. The amount of centralised procurement stood at approximately RMB 128,380 million.

• **Building a digital supply chain.** The Company improved the electronic bidding platform and promoted the "online remote bid evaluation" model during the pandemic to achieve centralised and transparent procurement. The risk rules and data models were embedded into the system to enable automatic risk identification, early warning and control throughout the entire supply chain processes. The Company enhanced the capability of e-commerce platform and provided diversified and convenient procurement support services for the basic networks. We established a unified supplier information database and built a "supplier portrait" to provide support for procurement review and supplier evaluation.

Total number of e-commerce platform vendors

71,000

14,000

new vendors in the year

Indicators	2019	2020	2021
Centralised procurement ratio (%)	90.6	91.4	96.7
Proportion of local suppliers (%)	>99	>99	>99
Proportion of electronic procurement (%)	68	88	96

Strengthening cooperation with terminal suppliers

The Company vigorously built a new pan-terminals ecosystem with the characteristics of China Unicom, strengthened the empowerment and guidance to terminal suppliers, expanded the operational boundaries, enriched product categories, and strengthened integrated operations to achieve common development.

• **Empowering partners with intelligence.** Relying on the service portal of terminal partners, the Company provided partners with one-stop services such as technical specifications, access guidelines, performance testing and product display. In 2021, it added more than 100 terminal suppliers and 15 service providers, privilege providers and financial service providers, with a total of over 300 partner brands. It sold a total of 25.95 million pan-intelligent terminals.

• **Guiding terminal suppliers to fulfill their responsibilities.** The Company strengthened the management of mobile malware. Terminal suppliers promised not to install malware in terminal products. It timely and dynamically communicated and understood the preventive measures adopted by terminal suppliers in terminal software. It required partners to consciously implement the national 3C (China Compulsory Certification) and SRRC (National Radio Management Committee) certifications for terminal products. The Company actively communicated with terminal suppliers with negative news, set up a special team to quickly implement customer complaints, information verification, customer comfort and other work, so as to reduce the negative impact on the society and maintain the corporate image and reputation.

At the 2021 China Unicom Partners Conference Channel and Terminal Ecosystem Cooperation Forum themed "Gathering Momentum with One Heart to Achieve Ecological Win-win", the deputy general manager He Biao proposed to integrate and cooperate with all parties in the industry chain in the future to jointly build a new ecosystem of channel cooperation, a new ecosystem of terminal synergy, and a new ecosystem of pan-terminal technology sharing, and jointly expand new potential for digital development.

Jointly building a new ecosystem of digital channel cooperation of "Three Connections": To give full play to the advantages of flat and agile operation, marketing service capacity and Internet big connection, and strive to jointly build a new ecosystem of digital channels of "integrated products, interoperable data and smooth marketing" with the industrial chain.

Jointly building a new smart terminal operation model of "Three Integrations": To give full play to the advantages of the precise handset replacement insights of millions of existing users and the precise terminal network-business alignment of 5G and broadband, and cooperate with partners to expand the development scale of "5G terminal integration, smart home pan-terminal integration, and industrial application intelligent terminal integration".

Jointly creating a new future of flourishing development of three-gigabit smart terminals: To give full play to the advantages of cloud-network integration, computing-network integration and Intelligence Brain, carry out in-depth cooperation with partners, jointly set standards for terminals and pan-terminals, break the shortcomings of terminal chips, and jointly build a modern digital supply chain.

Launched the Joint Laboratory of Pan-terminal Technology and Ecological Innovation

China Unicom established the Joint Laboratory of Pan-terminal Technology and Ecological Innovation. 21 enterprises including Huawei, Shanghai Quectel and Unisoc signed up to be the first batch of partners in the laboratory. The laboratory will focus on four major segments, namely technology and standards, testing methods and capabilities, business and application, and core technology research, so as to promote a new pan-terminals ecosystem with technologies.

Vigorously expanding channel cooperation

Adhering to the concept of coordinated development, open cooperation and win-win cooperation, the Company promoted the digital transformation of channel partners through online and offline joint innovation and mutual empowerment to enhance value, creating a win-win-win situation among operators, channel partners and users.

• **Strengthening the complementary advantages of channels.** Seizing the window of 5G handset upgrade, the Company seamlessly integrated its products and services into manufacturers' channels to promote the scale development of 5G. The Company made comprehensive use of financial installment, electronic coupons, supply chain finance and other capabilities to help the transformation of channel partners. The Company continuously improved the digital capabilities of its IT systems and promoted the use of ZhangWoTong APP in all channels, so as to quickly introduce new partners, sign up services and share revenue, and improve the efficiency and return of partners.

• **Promoting channel partners to fulfill their responsibilities.** The Company strictly implemented real-name registration business requirements, controlled risks at the source of account opening, eliminated potential risks, and fortified the "first line of defense" for security protection of SIM cards. The Company improved the prevention and control capabilities of the marketing and sales tools of ZhangWoTong and comprehensively applied the human image comparison technology and ID card verification equipment, etc.. While enhancing the convenience of customer service, it further strengthened the risk management process and helped channel partners carry out business activities in compliance with laws and regulations.

China Unicom jointly launched the "Channel Ecological Cooperation Alliance" with Xiaomi, D.Phone, Davao, JD.com and other partners. Through the integration of channel partners' strengths and wisdom, the Company continuously upgraded its channel ecosystem model to promote the sustainable development of channels.

Officially launched the Channel Ecological Cooperation Alliance

Approximate number of channel partners at the end of 2021

200,000

🛜 Flourishing digital cooperation new ecosystem

Facing the vast blue ocean of digital economic development, China Unicom continued to deepen cooperation with strategic investors and leading enterprises in industry verticals to jointly build a Big Application ecosystem with integrated, open and win-win cooperation, and serve the digital transformation, intelligent upgrading and integrated innovation in various fields of the economy and society.

Expanding new information consumption cooperation

The Company gave full play to the advantages of strategic partners in smart terminals, AI, Big Data, content and other fields to jointly provide customers with high-quality products and services.
- The Company cooperated with Baidu to sell 867,000 Xiaodu speakers and 190,000 WiFi6 routers. The smart customer service voice AI portal was launched in 31 provinces, with a smart service ratio of 80.2% and a national end-to-end recognition rate of 94%.
- The Company cooperated with Tencent to launch the Jiasubao product to reduce lag, latency and packet loss in games and improve user experience.
- The Company cooperated with Alibaba in the development of financial installment products, built China Unicom Digital Assistant through Alibaba Cloud, and upgraded product functions.

At the same time, the Company actively strengthened cooperation with ecological partners to jointly create strategic and innovative basic innovative products.
- The Company cooperated with partners such as Xinhuanet and the National Warning and Release Centre to promote the pre-commercial trial of 5G messages.
- The Company cooperated with iQIYI, Bilibili, Mango TV, ByteDance and other partners to carry out video targeted traffic value management.
- The Company cooperated with CCTV Cloud, Himalaya, Mango Active, China Literature Limited, iFLYTEK and other partners to launch online audio and digital reading products.
- SIM-CTID, a SIM digital identity authentication product, was jointly launched with Anicert and other partners.

Deepening cooperation in industrial transformation and upgrade

The Company gave full play to the magnification, superposition and multiplication effect of digital technology on economic development, joined hands with all parties in the industry to achieve win-win and sharing, fully opened up its capabilities, comprehensively met demand, and jointly served the demand for "cloudification, digital empowerment and intelligence" transformation and upgrade of hundreds of industries.
- The Company accelerated the promotion of 5G applications from "show flats" to "commodity flats". Relying on the 5G application innovation alliance, we built an open 5G ecological platform, and worked with partners to engage in "team competition".
- The Company planned and built an open China Unicom 5G Laboratory with Huawei and Unisoc, and developed a standardised 5G terminal R&D, testing and application process.
- The Company worked with partners to enrich the supply of security products and security operation services, and promoted the complementary advantages and coordinated development of the network and information security industry.
- The Company realised the large-scale promotion of key projects such as cooperative public cloud and joint venture cloud.

Building a capital cooperation ecosystem

The Company actively expanded and optimised its capital deployment. Focusing on serving national strategies and the Company's strategic businesses, it built a bridge for the ecological cooperation between industry and capital, and jointly built a capital ecosystem with strategic investors and industry leaders to strengthen synergy, increase innovation, and improve value. By strengthening industry chain through investment, the Company empowered and promoted the coordinated development of the industry.
- The product and service capabilities of the seven joint ventures, namely Yunlizhihui, Yunjingwenlv, Yundun, Yundee, Yunqi, Cloud Broadcasting and Smart Steps, continued to improve.
- The Company continued to deepen cooperation with investors, leveraged their respective advantages, deepened capacity enhancement and product promotion in cloud computing, Big Data, AI, Internet touchpoints and other fields, and expanded strategic synergy.
- The Company further strengthened capital operation, focused on five main responsibilities and main businesses, and comprehensively used diversified methods such as investment, mergers and acquisitions, equity participation and funds to promote rapid breakthroughs in key areas such as Beijing-Tianjin-Hebei, Yangtze River Delta, Guangdong-Hong Kong-Macao Greater Bay Area, Sichuan-Shaanxi-Chongqing, as well as key business areas such as industrial Internet, Internet of Vehicles, smart city, smart medical care, smart education, smart home, integrated communication, edge computing and information security, so as to amplify the functions of state-owned capital.
- The Company set up a 5G parent fund on a scale of over RMB10 billion focusing on 5G industrial ecology and related application fields. It leveraged the resource advantages of basic telecom operators, took advantage of government policies and resource advantages, and mobilised social industry capital to accelerate the development of 5G innovative business.
- The Company promoted the market-oriented reform of professional subsidiaries in the fields of Internet of Vehicles and industrial Internet. It promoted the introduction of strategic investors, mixed-ownership reform and listing of professional companies with high degree of marketisation, strong business independence, good development prospects and high valuation premium, and built a group of "specialised, niche, special and novel" enterprises with innovation capabilities and competitiveness.

🌐 Engaging in Public Charity to Benefit Society

China Unicom insisted on cultivating and practicing the core values of socialism and meeting the growing demand for social service of people. It actively took actions in providing aid to Tibet and Xinjiang, culture and sports, education, medical and health care, environmental protection, public welfare and other aspects, and continuously conveyed care and warmth to the society to serve the improvement of people's livelihood.

📡 Actively carrying out charitable donations

China Unicom has always adhered to the principles of voluntariness, acting within capacity, clear rights and responsibilities, and honesty and trustworthiness, continuously improved the management system of charitable donations, actively assumed social responsibilities, strived to repay the society, and promoted the sustainable development of charitable undertakings.

Donation Projects	Amount donated RMB'000
Invested in assistance funds	109.5
Aid to border areas (aid to Tibet and Xinjiang)	357.8
Other donations (culture and sports, education, medical and health care, charity, environmental protection, etc.)	1,615.2
Total	2,082.5

RMB 2,082,500

external donations in 2021

China Unicom further made great efforts to assist Tibet in the new era, and completed the "14th Five Year"Plan of China Unicom for Supporting Tibet. It increased its assistance in promoting industrial development, improving infrastructure construction, improving medical care and education capabilities, and strengthening interactions and exchanges among ethnic groups. During the year, it arranged 8 projects for Tibet assistance. The Company continued to carry out targeted assistance to Xinjiang. Through sending cadres to Xinjiang and carrying out smart assistance to Xinjiang, the Company took root in Xinjiang and made contributions to Xinjiang, thus creating a new path for central state-owned enterprises to help Xinjiang.

Improving infrastructure construction

Company visits by cadres assisting Xinjiang

China Unicom Jiangsu Branch launched smart assistance to Xinjiang

Campus recruitment in the University of Tibet

China Unicom (Sichuan) Industrial Internet Co., Ltd. has built a medical information system for Garze Tibetan Hospital, involving hospital outpatient management, inpatient management, comprehensive management, integrated platform, medical technology system, and TCM evidence-based system, while supporting the switch and display of Chinese and Tibetan, so that the ethnic minorities in Tibetan areas can feel the life convenience brought by medical informatisation.

◉ Deepening inclusive communications services

Helping the elderly and the disabled are people's livelihood projects that the state attaches great importance to. China Unicom continued to promote the implementation of various preferential policies and service measures for helping the elderly and the disabled, and strived to create a good information environment for the life and work of the underprivileged by doing practical things for them.

Smart elderly assistance

The Company focused on building services and capabilities in areas such as "heart-warming" services for the elderly, "filial piety" products for the elderly, and "reassuring" terminals for the elderly, adhered to the original intention of doing practical things for the public, and continued to carry out publicity and optimisation work.

• The Company created "heart-warming" elderly services. It provided elderly care channels in the business outlets, launched a "care version" of China Unicom APP, and enabled direct access to manual services in 10010 customer hotline. At present, 2,100 smart elderly assistance service centres have been set up in business outlets throughout the country. The 10010 hotline has provided services to the elderly for over 14 million times, and 42,000 offline elderly assistance activities have been held with 380,000 participants, helping the elderly to overcome the digital divide.

• The Company created the "filial piety" communication products for the elderly, and launched the silver age card, the filial piety card, the "WO Family Security Eye" and other products according to the actual needs of the elderly. In 2021, over 2.02 million users were benefited, and the accumulative communication tariff discounts exceeded RMB35.72 million.

• The Company built a variety of "reassuring" terminals for the elderly, meticulously self-developed and innovatively created intelligent communication terminal products for the elderly that were more user-friendly and useful, such as the "Little Assistant for the Elderly", for which it has applied for national network access certification.

China Unicom Hainan Branch joined hands with the Library of Hainan Province to carry out the "E-era of Silver Age" smartphone charity classroom activity for the elderly. The elderly were guided on how to prevent fraudulent calls, and were helped to use WeChat, health code, payment and other common APP, so that the elderly were able, dare and willing to use smart products.

"E-era of Silver Age" Smartphone Charity Classroom for the Elderly

According to the reading habits of the elderly, China Unicom Hubei Branch has compiled the Manual of Assistance for the Elderly of China Unicom Hubei Branch with large fonts and pictures to help the elderly to easily master 10 uses of WeChat such as adding WeChat friends, video chat, and moments, etc. By means of information services to communities, nursing homes and other offline activities, the manual was distributed to the elderly and was widely praised.

Manual of Assistance for the Elderly

Helping the disabled with warm heart

China Unicom cares for the communication service needs of people with disabilities and focuses on solving their service pain points.

• The Company innovated on tech products and created the first barrier-free communication product for hearing-impaired people, namely the "Unicom Hearing King Card", to realise real-time conversion of text and voice, and help hearing-impaired people realise barrier-free communication. China Unicom APP has a designated area for Hearing King Card. Special care personnel on the online customer service platform served users of the Hearing King Card for a total of 22,000 times with a 100% satisfaction rate.

• In cooperation with the National Disabled Persons' Federation, National Association of the Deaf and China Association of the Blind, the Company launched the nation-wide unified "Hearing King Card" and "Viewing King Card". For all disabled users, the Group launched the nation-wide unified preferential packages for them. In 2021, more than 80 exclusive packages for the disabled were launched nationwide, benefiting approximately 553,800 disabled users, and the accumulative communication tariff discounts exceeded RMB 170 million.

• On 17 May, China Unicom cooperated with the National Association of the Deaf and successfully launched the first operator sign language live broadcast, covering a total of 15 internal and external platforms with 8.76 million viewers. At present, the Company has conducted a total of 7 heart-warming sign language live broadcasts and simultaneously created 35 communication knowledge videos for the disabled to help solve the communication service problems of the hearing impaired.

China Unicom Beijing Branch actively organised and conducted research on barrier-free navigation projects to develop Beijing's barrier-free environment, improving the quality of life services for the disabled. The barrier-free navigation on-site experience trial was highly appraised by more than 20 leaders and experts from China Disabled Persons' Federation and Beijing Disabled Persons' Federation.

The Company actively cooperated with Beijing Disabled Persons' Federation and Beijing Deaf Association to hold the activity of "I do practical things for the public –barrier-free listening, helping the disabled with love", donated communication products for disabled users on site worth RMB6 million and established a WeChat circle of friends for the hearing impaired. We set up a "designated area for Hearing King Card" in our own business outlets to allow hearing-impaired friends to enjoy heart-warming services.

Barrier-free navigation on-site experience trial

"Barrier-free Listening, Helping the Disabled with Love" activity

On 3 December 2021, the 30th International Day for the Disabled, China Unicom Ganzhou Branch held a charitable activity with the theme of "Everyone Caring for the Disabled, Let Love Speak". At the event, China Unicom Ganzhou Branch sent daily necessities to the hearing impaired. Our staff explained and demonstrated the features of the Hearing King Card at the event. Nearly 50 hearing impaired people participated in the event.

China Unicom Ganzhou Branch Assisting the Disabled

🔆 Actively participating in volunteering services

China Unicom combined the volunteer spirit of "dedication, friendship, mutual assistance and progress" with the goal of building a team of cadres and employees. Based on the work ideas of expanding the team, stimulating vitality, improving quality and advocating civilisation, it systemised the organisation and management system of volunteering services, standardised the construction of volunteering service teams and normalised volunteering service activities. It fulfilled social responsibilities, established a good corporate image, assisted the transformation and development of the Company and the construction of corporate culture, and promoted the high-quality development of the Company.

57,550
registered volunteers

68,735
participation in volunteering service activities

Caring for Every Little Thing and Building a WO Future Together – China Unicom created a points-based charity brand to support education

The program, based loyalty points, connected with 350 million customers of China Unicom to build a new model of diversified charity participation, and drive social forces to support targeted poverty alleviation. It was an active attempt for China Unicom to fulfill its social responsibilities and demonstrate its brand influence. In 2021, we provided nearly 40 services in total, with more than 500,000 participating volunteers. We donated "Love Libraries" to 132 Primary Schools in Southern Xinjiang, provided scholarships for 8,000 poor children, and sent 3,015 sets of warm winter supplies to Tibet children.

Donation ceremony of "Love Libraries" of China Unicom
Bazhou Branch, Xinjiang

China Unicom Tacheng Branch in Xinjiang launched the
"Winter Olympics in the Love Libraries" and other primary and
secondary school writing and painting competitions

On top of the traditional points-based donation, the Company further expanded into various charity activities such as "WO's Reading", "China Unicom Online Call Charge Thumbs-up" and "Tencent 99 Charity Day Double".

The Network Department and the Winter Olympics Office of the Group jointly launched a series of volunteering services titled
"Love Ignites Hope, Building Dream with China Unicom Together"

China Unicom Xiaoyan, Service to Home – China Unicom Jiangsu Branch Xiaoyan Volunteer Service Brand

"Touching a city and warming a province. Standing with integrity and dedication, helping the elderly and caring for disabled, China Unicom Xiaoyan started from the needs of users, and made innovation and wisdom with a foot on the hot soil of Jiangsu." In May 2021, China Unicom Jiangsu Branch Xiaoyan won the Service Innovation Award of "Touching China, Jiangsu Role Model of the Year".

• China Unicom Xiaoyan penetrated the community. During the COVID-19 pandemic, China Unicom provided users with handset-to-home service, SIM card-to-home service, broadband-to-home service and network-to-home service without fear of risks. The average user rating was 9.64 out of 10.

• China Unicom Xiaoyan went to the frontline of the fight against the pandemic. In the face of the pandemic in Nanjing and Yangzhou, the volunteers from Xiaoyan rushed to support the front line and penetrated testing sites. They urgently purchased drinking water and snacks to help residents alleviate hunger; they helped the residents waiting for testing to scan codes, register, fill in data, and generate inspection information, fully supporting the efficient implementation of nucleic acid testing.

• Volunteers from China Unicom Xiaoyan also visited welfare homes, sanitation venues, and college entrance exams to carry out charity activities such as "Bringing Coolness by Xiaoyan" and "Caring for the Elderly, Moving Nanjing" to show care to users and the public with warm smiles and attentive service.

China Unicom Jiangsu Branch Xiaoyan Service in Community

China Unicom Jiangsu Branch Xiaoyan rushed to support the front line of the fight against the pandemic

China Information Technology Designing & Consulting Institute Company Limited and China Unicom Online Information Technology Company Limited jointly carried out a charity activity titled "Connecting You and Me with Heart-warming Education Support"

The Youth League Branch of Asset Operation Company held a warm winter clothing donation activity titled "Warm Clothes for the Winter"