2022
SUSTAINABILITY
REPORT

中国联通
China unicom

CHINA UNICOM (HONG KONG) LIMITED
HKEx: 762

New Journey New Mission New Chapter

Promoting Chinese-style modernization with digital, network-based and intelligent transformation

FORWARD-LOOKING STATEMENTS

Certain statements contained in this report may be viewed as “forward-looking statements” . Such forward-looking statements are subject to known and unknown risks, uncertainties and other factors, which may cause the actual performance, financial condition or results of operations of the Company to be materially different from any future performance, financial condition or results of operations implied by such forward looking statements. In addition, we do not intend to update these forward-looking statements. Neither the Company nor the directors, employees or agents of the Company assume any liabilities in the event that any of the forward-looking statements does not materialise or turns out to be incorrect.

CONTENTS

04 Message from Chairman

06 About China Unicom

06 Company Profile
06 Cultural Philosophy
07 Corporate Strategy
08 Corporate Governance

72 Sustainable Development Management

72 Sustainability Development System
73 Management of Material Issues
74 Communication with Stakeholders
75 Sustainability Management Capability

76 Appendices

76 Key Performance
76 Operations and development
76 Network capabilities
76 Commitment in major assurance Initiatives
77 Independent innovation
77 Customer service
77 People-oriented
78 Low-carbon development
78 Compliance management
78 Community responsibility
79 Honors and Recognition
79 Description to the Report
80 Indexes
83 Feedback

Forge Ahead on a New Journey and Shoulder the New Mission to Help Build a Powerful Modern Country 11

Shouldering mission and driving strategic upgrade 13
Effective implementation to break new ground 15

Demonstrate New Achievements and Empower the New Development of Modern Industries 17

Resolutely serve as the "Pillar" to build a solid digital base 19
Strive to become the "Leader" in supporting modern industries 24
Make every effort to become the "Frontline Troop" of innovation-driven development 31
Committed to serving as the "Escort" of network security 37
Actively building a win-win "New Ecosystem" for the digital industry 40

Build New Vitality and Create a New Landscape of Modern Governance 45

Serving as the "Pioneer" to deepen the reform of state-owned enterprises 47
Building a "New-Highland" for innovative talents 50
Building a "Booster" for people's livelihood 54
Striving to be a "Practitioner" of ecological civilisation construction 67

Note: Please refer to the 2022 annual report for the details of Corporate Governance Report.

Message from Chairman

2022 is an important year for the new journey towards the establishment of a modern socialist country and progression towards bicentenary goals, as well as the starting year for the Company to fully implement its new strategic plan. Facing the combined impact of multiple unexpected factors, the Company resolutely implemented national strategic plans, and maintained strategic determination. The Company has undertaken its responsibility as a central state-owned enterprise in major initiatives such as Cyber Superpower, Digital China, technological innovation and rural revitalization, made outstanding contributions in major events such as the Winter Olympics, the battle against the pandemic and major assurance initiatives, and devoted efforts in key challenges such as reform and transformation, making up for shortcomings and building advantages. China Unicom has contributed its wisdom, solutions and strength to promote the integration of corporate development into the sustainable development cycle of economy, society and environment.

Keeping in mind the mission of the "national team" to build a modern digital base. Keeping the top priorities of China in mind, China Unicom has accelerated the construction of an intelligent and integrated digital information infrastructure, with a view to laying a solid digital foundation for Chinese-style modernization. The Company strived to build four premium networks for 5G, broadband, government and enterprise as well as computing power. We have deployed 1 million 5G base stations and thus established a co-built and co-shared 5G network with the largest coverage, largest bandwidth, and fastest speed in the world, achieving continuous coverage of townships and regions at higher levels and effective coverage of administrative villages across the country, thereby helping to narrow the digital divide. With a gigabit fibre network covering more than 200 million households and seamless in-home coverage of gigabit WiFi, China Unicom won the Digital Home Operator of the Year Award at the World Broadband Forum. We created a premium government and enterprise network with wide coverage, low latency and high reliability, and further reduced the average tariffs of broadband and leased line for small and medium enterprises by 10%, laying a solid foundation for the digital transformation of government and enterprise customers. By implementing the "Eastern Data, Western Computing" project, we have built a premium computing power network covering 8 major hub nodes across China and computing centers in 31 provinces, creating an unobstructed information channel for economic and social development. With the successful completion of top-level communication support tasks such as the 20th National Congress, the Beijing Winter Olympics and Paralympic Games, and cloud diplomacy, China Unicom was named "Outstanding Contribution Group at the Beijing Olympics and Paralympics Winter Games" by the Central Committee of the CPC and the State Council, strengthening its brand as the "first choice of the country, government and people". The Company implemented the overall national security concept and strengthened the defense line of cybersecurity, and achieved excellent results in major network attack and defense practical exercise. The Company made every effort to support the prevention and control of the pandemic by ensuring the security and smoothness of the entire network, the stable operation of the system and uninterrupted services, demonstrating its responsibilities as a central state-owned enterprise.

Undertaking the responsibility of the "key force" to facilitate the upgrade of modern industries. Focusing on "people's need" and "needs of the industry", China Unicom has been accelerating the deep integration of the digital economy and the real economy, and strives to become the "key force" and "leading player" that drives Chinese-style modernization through digital, network-based and intelligent transformation. Always adhering to the original aspiration of "people's post and telecommunications for the people", and to meet the demand for quality upgrade of digital consumption, China Unicom launched "eight gold and eight silver" key products, released a special service plan for senior citizens, offered diversified innovative applications involving smart education, smart medical care as well as smart culture and tourism, and promoted inclusive services for people's livelihood. With the comprehensive upgrade of Unicom Cloud, the Company established a good reputation of "secure digital intelligent cloud", created the No.1 brand in the field

of "5G + Industrial Internet", and realized full coverage of 20 major application scenarios, to empower the transformation and upgrade of various industries. The Company strengthened its bond and cooperation with the government to help governments at all levels to keep up with the trend of digitalization and achieve digital transformation. The Company has undertaken the construction of 15 big data platforms for ministries and commissions as well as 12 provincial big data platforms to promote the development of local digital economy. To build the No. 1 security shield of the country, government and people for the digital economy, the Company cooperated with Pengcheng Laboratory to build the first 5G security range in China, and worked with nearly 400 partners to jointly build a "New Great Wall" for cybersecurity. The Company continued to endeavor for the comprehensive rural revitalization and build the No.1 brand for digital village. The Company fulfilled the requirements of the national "dual carbon" policy. It saved more than 17.5 billion kWh of electricity and reduced carbon emissions by more than 10 million tons per year through 4G/5G co-build and co-share. It also launched a range of green informatisation solutions for smart water conservancy, environmental monitoring and energy consumption management, to empower the green transformation of production and living and protect the natural environment of our motherland.

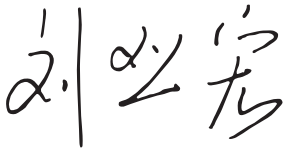
Fulfilling the role of "frontline troop" to boost the momentum of modern innovation. China Unicom is committed to becoming the "backbone of the nation" and insists that technology is the primary productive force, talents are the primary resource, and innovation is the primary driving force. Therefore, it has accelerated the transformation from a traditional operator to a technological innovation enterprise, helping to stimulate and boost the new momentum of Chinese-style modernization. The Company has made milestone progress in achieving high-level independence and competence in technologies, with an R&D investment of RMB14.38 billion and technological innovation talents ratio of 30%. With the establishment of China Unicom Science and Technology Association, the Company has engaged 16 fellows as special experts of the Science and Technology Committee. The National Engineering Research Centre for the Next Generation of Internet Broadband Business Application was selected as one of the first innovation bases under the "Innovation China" project. We supported High-Tech Winter Olympics to achieve more than 20 "historical breakthroughs" and "global firsts". The Company launched more than 20 technological products for fighting the pandemic including Digital Sentinels and Cloud Cabin. It made 10 major achievements in scientific and technological innovation. The number of patents granted grew by more than 50% year-on-year. Revenue from self-developed products grew by 70% year-on-year. The Company won the honorary title of "Enterprise with Outstanding Contributions to Scientific and Technological Innovation" from the SASAC and the 2022 World Internet Leading Technological Achievement Award. The Company drove its digital transformation to enable full-process, all-customer and full-range coverage, and further improved the effectiveness of smart operation of its five major APPs, five major operating platforms and five major middle platforms, effectively providing data and tool empowerment for the front line. Digital capabilities are getting from "OK" to "great". Front-line productivity has been significantly improved, and customers can enjoy smarter, more convenient, and warmer service experience.

"Accelerating" the pace of reform to improve modern governance capabilities. By leveraging the advantages as a pioneer of the mixed-ownership reform, China Unicom has been driving the long-term institutionalization of modern corporate system with Chinese characteristics and market-oriented operation mechanism, and continuously improving the modernization level of corporate governance system and governance capabilities. The three-year action plan for state-owned enterprise reform has been concluded with the successful completion of 130 reform tasks in 10 aspects. With continuous improvement in the development of its board of directors, Unicom A Share Company has been evaluated as "excellent" for board development by the SASAC for two consecutive years. The Company's subsidiaries have all established a board of directors, if appropriate, with complete and strong members. The Company continues to improve its quality as a listed company, takes the lead in exploring a valuation system with Chinese characteristics and actively responds to investor concerns. Unicom A Share Company has received top rating for information disclosure from the Shanghai Stock Exchange for five consecutive years. Adhering to "one China Unicom with integrated capability, operation and services", China Unicom has built a matrix system of distinctive capabilities, clarified the positioning of headquarters and departments as well as main responsibilities and main businesses, supported 17 professional subsidiaries to establish "specialised, niche, special and novel" capabilities, and set up 10 industry forces covering 9 major sectors, to provide a package of "one-point access, response nationwide, tailor-made" services for various industries. With a view to building a robust and excellent operation and service system, the Company has launched county (district) improvement projects to promote the upgrade of front-line production organizations and maximize the vitality of business development for "small units" with front-line responsibilities, greatly enhancing employees' sense of happiness and reward. Attaching equal importance to development and security, the Company operates in compliance with laws and regulations, effectively prevents and resolves major risks, continues to strengthen, optimise and expand state-owned capital, so as to accelerate its development into a world-class enterprise with excellent products, outstanding brands, leading innovation and modern governance.

2023 is a key year for China Unicom to further implement the "1+9+3" strategic planning system. We will fully implement the arrangement of the Economic Work Conference of the Central Committee, advance the "nine determination", implement the "nine perseverance" and strengthen the "five endeavours" so as to continuously improve core competitiveness and sustainable development capability, make new achievements in high-quality development with new morale and initiatives, and contribute to Chinese-style modernisation with digital, network-based and intelligent transformation.

China Unicom (Hong Kong) Limited

Chairman & CEO



March 2023

About China Unicom

COMPANY PROFILE

China Unicom (Hong Kong) Limited ("China Unicom" or the "Company") was incorporated in Hong Kong in February 2000 and listed on the New York Stock Exchange* and The Stock Exchange of Hong Kong Limited on 21 June 2000 and 22 June 2000 respectively. The Company was included as a constituent stock of the Hang Seng Index on 1 June 2001 and merged with China Netcom Group Corporation (Hong Kong) Limited on 15 October 2008.

China Unicom has been listed as one of the "Fortune Global 500 Companies" for 14 consecutive years and ranked 267th in the Fortune Global 500 in 2022. It has also been named as the "Most Honoured Telecom Company in Asia" by Institutional Investor for seven years in a row.

China Unicom sails along the main course of digital economy at full strength and regards "Big Connectivity, Big Computing, Big Data, Big Application and Big Security" as its main responsibilities and businesses. It seeks to achieve total upgrade in the momentum, path and means of its development. It strives to tap new growth opportunities, enhance customer value, and better serve and integrate into the new paradigm.

* The Company's ADSs were delisted from the New York Stock Exchange on May 18, 2021. For details, please refer to the announcement of the Company dated 23 July 2021.

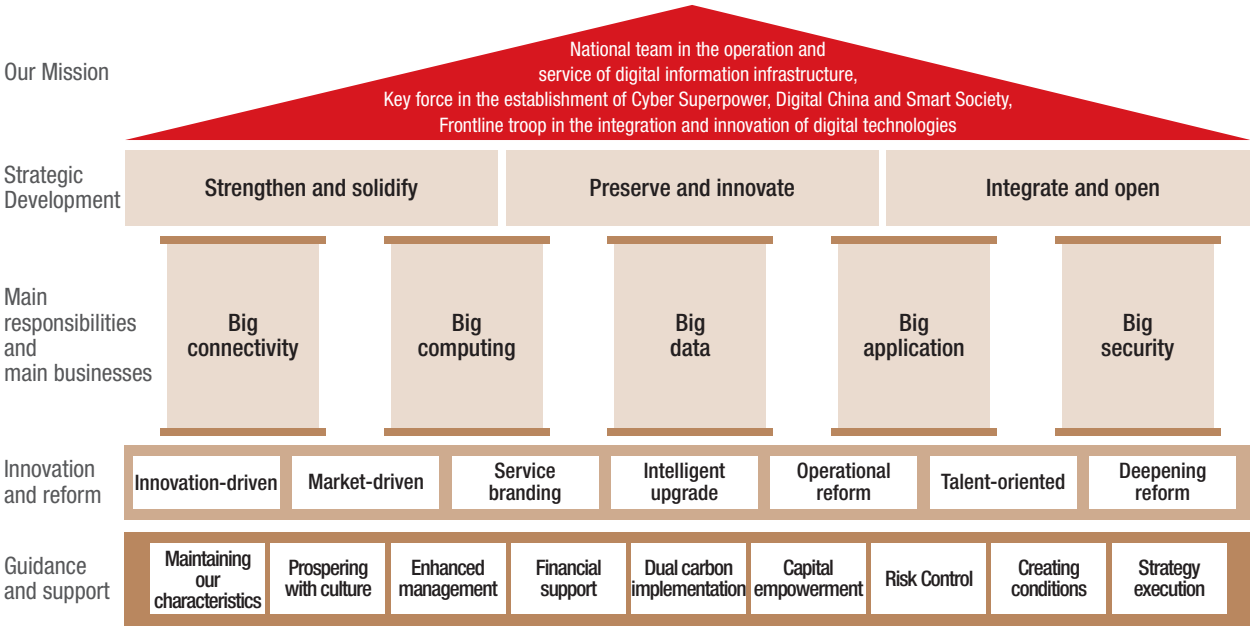
CULTURAL PHILOSOPHY

In order to become a world-class enterprise with global competitiveness, the Company aims to build a corporate culture that meets the requirements of the modern enterprise system with Chinese characteristics, and establish a corporate culture concept system guided by new strategies.

China Unicom Corporate Culture System

CORPORATE STRATEGY

China Unicom has fully embraced its new mission in the new era, with a clear focus on new positioning, new strategies, new layout and new tasks of its development. The Company has taken the responsibility of becoming "national team in the operation and service of digital information infrastructure, key force in the establishment of Cyber Superpower, Digital China and Smart Society, frontline troop in the integration and innovation of digital technologies". Guided by the strategies of "Strengthen and solidify, Preserve and innovate, Integrate and open", the Company vigorously developed the five main responsibilities and businesses, namely "Big Connectivity, Big Computing, Big Data, Big Application and Big Security". It firmly steers on the main course of digital economy at full strength, continues to strengthen, optimise and expand state-owned capital. With these efforts, China Unicom strives to become a world-class enterprise with global competitiveness.



China Unicom strategic system

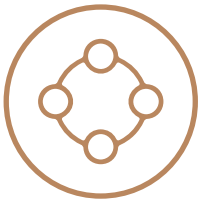
NEW STRATEGIES

The Basic Skills of Strengthen and Solidify:

The foundation of strong networks, solid service foundation, and basic skills

The Preserve and Innovate:

We will further highlight the integrity of the network, expand the new digital and intelligent models, and make a good combination.



The Integrate and Open:

to highlight the integration of elements and market integration, and win the "League Competition" with partners.

CORPORATE GOVERNANCE

The Board of Directors of China Unicom is committed to maintaining high standards of corporate governance (including information disclosure) and recognises that good corporate governance is vital for the long-term success and sustainability of the Company's business. As a company incorporated in Hong Kong, the Company adopts the Companies Ordinance (Chapter 622 of the Laws of Hong Kong), the Securities and Futures Ordinance and other relevant laws and regulations as the basic guidelines for the Company's corporate governance. As a company listed in Hong Kong, its current Articles of Association fully complies with the regulatory requirements of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited. These rules serve as guidance for the Company to improve the foundation of its corporate governance, and strives to meet the relevant requirements of international and local corporate governance best practises. There were no instances of any violation of listing laws and regulations by China Unicom in 2022.

Responsibilities toward the Capital Markets

China Unicom strictly fulfils its information disclosure obligations to ensure the truthfulness, accuracy, completeness and timeliness of information disclosed to the public (including inside information). In order to unify the standards for information disclosure, the Company has established the Information Disclosure Committee chaired by the management, which clarifies the procedures for the compilation and reporting of financial, operational data, as well as other information, and the procedures for the preparation and review of periodic reports. The Company makes specific provisions on the contents and requirements for the verification of financial data, especially requiring the responsible persons of each major department to issue a statement letter to be assumed by individuals from bottom to top. The Company's efforts in corporate governance (including information disclosure) were highly regarded by the capital market and received a number of awards.

- The Company adhered to fair disclosure and held result briefings or presentations in Hong Kong and Beijing immediately after the publication of annual and interim result announcement to ensure that all investors have equal access to relevant information.

The Company actively participated in various surveys and inquiries conducted by regulators and exchanges, and earnestly put forward constructive opinions and suggestions. The Company also regularly invites different professional teams to provide trainings to the Directors on the latest development of relevant laws and regulations, market environment and industry development, to enhance their performance abilities.

Responsibilities toward the Investors

The Company attached great importance to investor relations and communicates with investors through various channels. Annual general meeting shall be held every year, and extraordinary general meeting may be held when the Board deems it appropriate, the Company's Directors and representatives of Board committees will attend the meetings. All matters at the Company's general meetings are resolved by poll and the relevant procedures are explained at the meeting and the Company publishes the poll results in a timely manner, thereby offering protection of the shareholders' rights and interests. The Company adopted Shareholders' Communication Policy to ensure that the shareholders are provided with readily, equal and timely access to balanced and understandable information to protect their right to know.

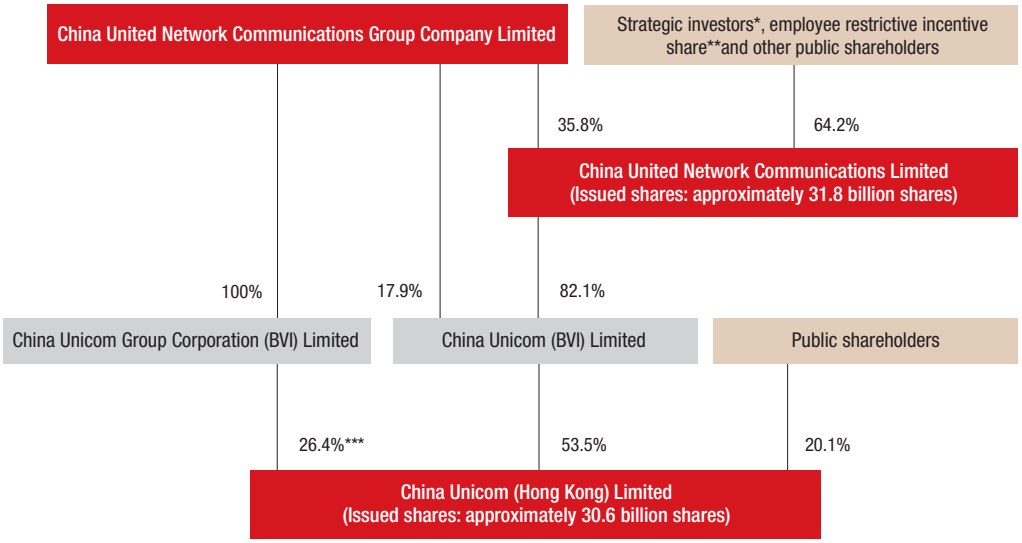
In addition to publishing annual reports and interim reports, the Company discloses unaudited financial information and other performance indicators on a quarterly basis and announces operational statistics on a monthly basis in order to further enhance the Company's transparency and improve investors' understanding the of the business operation of the Company. Upon the announcement of interim and annual results, the Company will generally hold global conferences with investors, during which the Company's management would accurately and thoroughly respond to questions raised by stakeholders. In 2022, the Company proactively to optimise its voluntary information disclosure indicator system. It broke the industry tradition of over 20 years and enhanced market transparency in key business areas such as "Ubiquitous Connectivity, Innovative Application, Smart Service, and Technological Innovation".

The Company has established the investor relations department, which is responsible for providing information and services requested by investors and maintaining timely communications with investors and fund managers. The Company also arranges from time to time roadshows and actively attends investor conferences arranged by investment banks, through which the Company's management meets and communicates with investors. The Company actively responds to investors' concerns, and transparently makes adequate disclosures on the Company's efforts to address climate-related risks on climate change issues that have been widely concerned by investors in recent years. In July 2022, China Unicom, China Mobile and China Telecom proactively organised investor communication event for listed companies in the telecommunications industry. With the theme of "Embracing the New Blue Ocean of Digital Economy and Discussing the New Future of the Telecommunications Industry", the event conducted in-depth exchanges with investors on the transformational development and promising prospects of telecom operators in the digital economy era.

Latest updates on the Company's significant business developments are being provided in a timely and accurate manner through announcements, press releases and the Company's website (www.chinaunicom.com.hk), so that investors can keep abreast of the Company's latest developments. The Company was voted as "Asia's Best IR Team (Telecoms)" by Institutional Investor.

Real-time interaction between virtual hosts and real-life guests with cutting-edge technologies

Shareholding structure



Shareholding Structure Chart of China Unicom

Note:

* In 2017, approximately 10.9 billion shares of China United Network Communications Limited were acquired by the strategic investors introduced by the mixed ownership reform through non public share issuance and transfer of existing shares. These shares were no longer restricted from sale in November 2020.

** Pursuant to the phase 2 restrictive share incentive scheme in 2022, China United Network Communications Limited granted restricted shares to the core management talents and professional talents.

*** Excluded the interest regarding the pre-emptive right owned by China Unicom Group Corporation (BVI) Limited in 225,722,791 shares of the Company.

As at 31 December 2022

Board of Directors and Management

To serve the best interests of the Company and its shareholders, the Board of Directors of the Company is responsible for reviewing and approving major matters of the Company, including, amongst others, business strategies and budgets, major investments, capital market operations, as well as mergers and acquisitions. It is also responsible for monitoring risk management and internal control, reviewing and approving environmental, social and governance strategies, and reviewing and approving the announcements periodically published by the Company regarding its business results and operating activities. In addition, the Board of Directors has overall responsibility of environmental, social and governance strategies and reporting. There are three Board committees under the Board, namely the Audit Committee, the Remuneration Committee and the Nomination Committee, each of which has a written charter, which is available on the websites of the Company and the Hong Kong Stock Exchange.

Currently, the Board of Directors comprises experts from diversified professions such as telecommunication, information industry, technology, finance, banking, investment and management, and is diversified in terms of gender, age, duration of service, educational background, professional experience, etc., which contributed to the enhanced management standard and more regulated operation of corporate governance of the Company, and results in a more comprehensive and balanced Board structure and decision-making process.

Liu Liehong

Chairman and
Chief Executive Officer

Chen Zhongyue

Executive Director and
President

Wang Junzhi

Executive Director

Liang Baojun

Senior Vice President

He Biao

Senior Vice President

Tang Yongbo

Senior Vice President

Li Yuzhuo

Executive Director and
Chief Financial Officer

Cao Xingxin

Senior Vice President

Cheung Wing Lam Linus

Independent Non-executive
Director

Wong Wai Ming

Independent Non-executive
Director

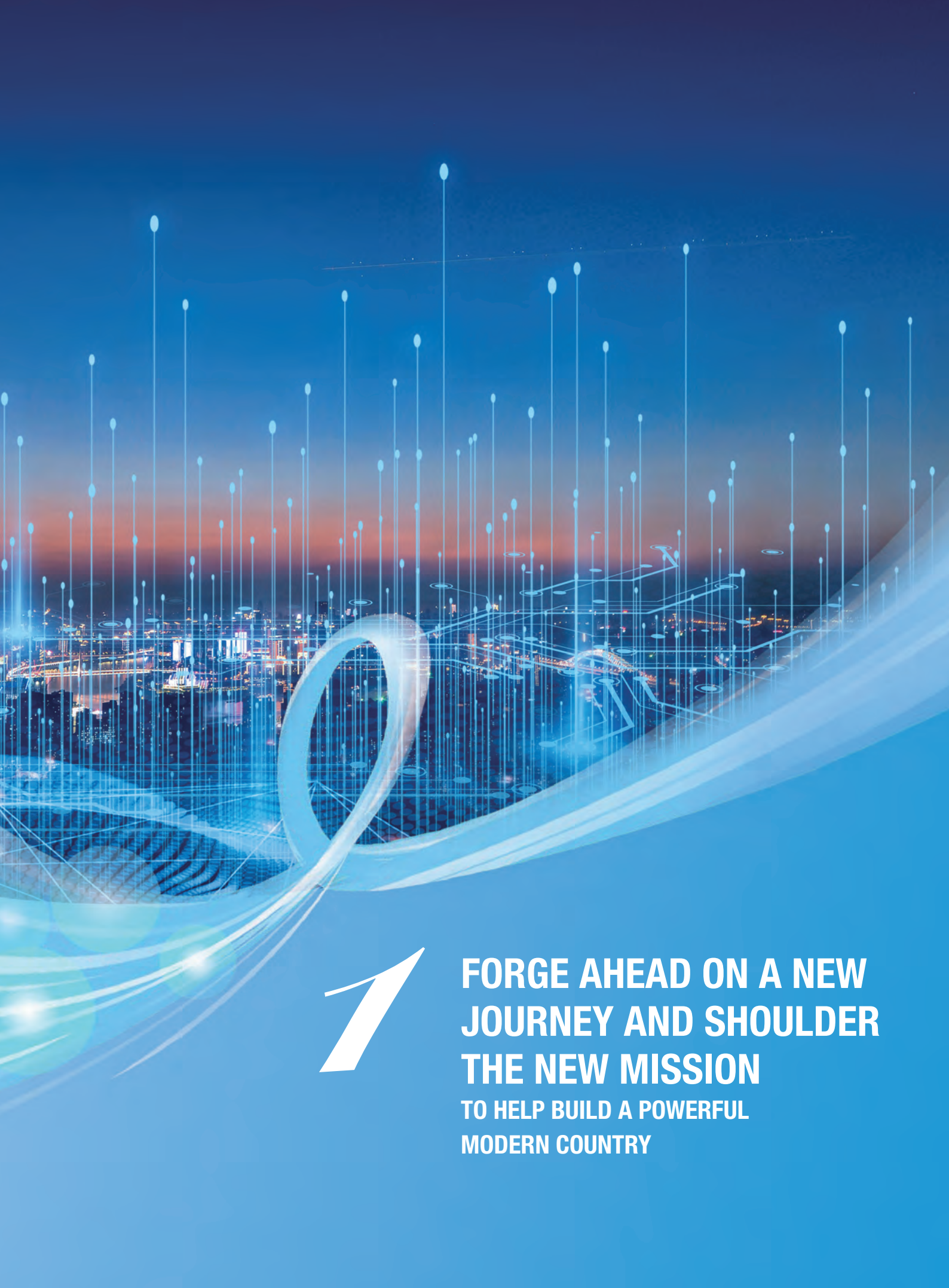
Chung Shui Ming Timpson

Independent Non-executive
Director

Law Fan Chiu Fun Fanny

Independent Non-executive
Director

Note: Changes in the composition of the Board and the management during the year 2022 and up to the date of this report.
Li Yuzhuo (appointed as Executive Director on 28 February 2022).
Mai Yanzhou (appointed as Executive Director on 28 February 2022 and resigned as Executive Director on 30 May 2022).
Cao Xingxin (appointed as Senior Vice President on 8 March 2023).



1 FORGE AHEAD ON A NEW JOURNEY AND SHOULDER THE NEW MISSION

TO HELP BUILD A POWERFUL MODERN COUNTRY

Shouldering Mission and Driving Strategic Upgrade Effective Implementation to Break New Ground

China Unicom always bears in mind the "two imperatives", cares for the "the country's top priorities", cares for the "people's needs", and takes the new mission entrusted by the Party and the country in the new era. Taking into account the new changes in the internal and external development environment, China Unicom further promotes the iterative upgrade of the Company's strategic planning system, and solidly promotes the implementation of strategies with good results, which fully demonstrates China Unicom's mission and responsibility as a "national team, key force, and frontline troop" that integrates into and serves the national strategy, helps economic and social transformation and upgrading, and meets the needs of people for a better digital life, and has been fully recognised by the supervising authorities and highly praised by all sectors of society.

Measures adopted in 2022

- The Company upgraded its strategic planning system and undertook the responsibilities of central enterprises such as Cyber Superpower, Digital China, Technological Superpower and Enterprise Reform in a more comprehensive and systematic manner.
- The Company made every effort to build four premium networks of 5G, broadband, government and enterprise and computing power, and the network quality reached a new level.
- We strived to create digital products and services for industry integration, people's livelihood services and government governance, and achieved new breakthroughs in value creation.
- Focusing on R&D investment, talent development, achievement quality and other aspects, we have made milestone progress in promoting high-level technology self-reliance and self-improvement.

Actions to be taken in 2023

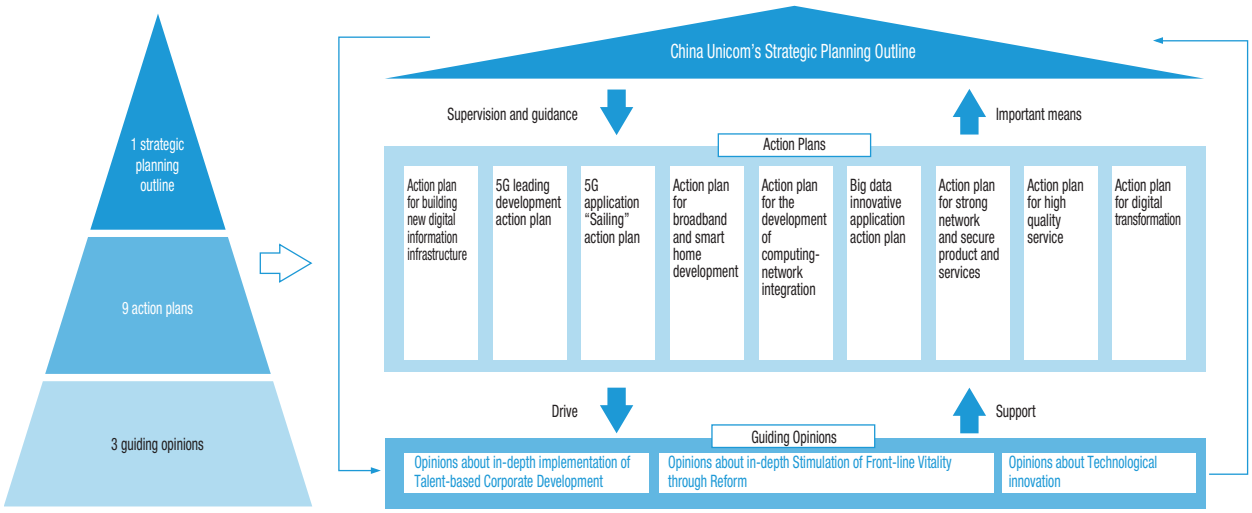
- We will further implement the "1 + 9 + 3" strategic planning system and accelerate the construction of a world-class enterprise.
- Adhering to the principle of moderately advancing, promoting network use though construction, and aligning network use with construction, we will make every effort to promote the new leap from "basic connectivity" to "interconnection of all things".
- Leveraging the advantages of the integration of cloud, big data, IoT, artificial intelligence, blockchain and security, we will optimise and strengthen digital products and services in key industries, and promote the development of digital economy, digital government and digital society.
- We will resolutely implement innovation-driven development and strive to build an innovative technology enterprise.

Shouldering Mission and Driving Strategic Upgrade

Through the iterative upgrade and closed-loop implementation of the strategic planning system, the latest national decisions and deployments and the Company's key tasks were implemented effectively.

Promoting the iterative upgrade of the strategic planning system

China Unicom fully grasped the new trend of industry technology and market development, and took into account the actual needs of its own development to upgrade the strategic planning system from "1 + 8 + 2" to "1 + 9 + 3", so as to undertake the responsibilities of central state-owned enterprises such as Cyber Superpower, Digital China, Technological Superpower and enterprise reform in a more comprehensive and systematic manner.



China Unicom's strategic planning system has been upgraded from "1+8+2" to "1+9+3"

Under the guidance of the "1+9+3" strategic planning system, the Company's strategic recognition and strategy implementation are more coordinated and unified. The methodology of overall planning and systematic policy implementation has gradually formed a system, with smoother strategy-oriented goal management and goal-oriented business performance management. The new strategy not only serves as a general action plan for promoting the Company's high-quality development in the new era, but also serves as a centralised reflection and specific action for the Company to implement the national decisions and deployments.

Building a closed-loop system for strategic planning and implementation

The Company has built and improved a closed-loop system for strategic implementation that links strategic publicity and training, interpretation and implementation, and monitoring and evaluation, and took multiple measures to promote the effective implementation of strategies.

• **Systematic publicity and training.** The Company carried out various forms of learning and publicity activities, achieving 100% coverage of "persons in charge" at all levels, with more than 360,000 participants participating in the learning. At the same time, the Company prepared the "China Unicom Strategic Planning Series Paper" for unifying thoughts, gathering consensus, answering questions and guiding practices.

China Unicom Henan Branch held a strategic planning meeting

• **Characteristic interpretation and implementation.** Each department of the headquarters and each subsidiary not only undertook and implemented the plan faithfully, but also established their annual goals and key tasks based on their own clear focus. The departments of the headquarters sorted out and optimised their positioning, main responsibilities and main businesses. 31 provincial branches formulated annual work objectives and key tasks lists. 336 municipal branches formed annual implementation plans, and 17 secondary professional subsidiaries specified their "specialised, niche, special and novel" abilities.

• **Routine monitoring and evaluation.** The Company established a strategic evaluation indicator system, and specified 66 core indicators, 148 important indicators and 129 general indicators. On a quarterly basis, it carried out review and evaluation of strategy implementation, summarised results, found problems, and put forward suggestions for optimisation.

The management of the Company overcame the impact of the pandemic and went to the front-line to carry out full-coverage special visits on the strategy implementation of provincial branches, subsidiaries and headquarters departments to ensure the high-quality implementation of the strategy.

Chairman Liu Liehong visited China Unicom Shanxi Branch, and went to the intelligent working platform No. 108 located 800 metres under the ground

President Chen Zhongyue visited China Unicom Chongqing Branch

Effective Implementation to Break New Ground

2022 is the starting year for China Unicom to fully implement its new strategic plan. The Company focuses on the implementation of the new strategy with a firm attitude, quick actions and effective measures, and has achieved a number of milestones, which in turn boosted the morale of employees and established a new image of a responsible central state-owned enterprise.

Digital information infrastructure reaching a new level

China Unicom is comprehensively constructing high-speed and ubiquitous, air-space-ground integrated, cloud-network integrated, smart and agile, green and low-carbon, and secured and controllable digital information infrastructure of intelligence and comprehensiveness. It has built a strong network which is the "first choice of the country, government and people", and actively took its responsibilities with the "the country's top priorities" in mind to make every effort to serve and support the overall development of the state.

The Company made every effort to build four premium networks for 5G, broadband, government and enterprise as well as computing power, bringing the network quality to a new level

Premium 5G network:

- Cooperated with China Telecom to build the largest 5G co-built and shared network with the highest bandwidth and fastest speed in the world. The number of 5G mid-band base stations exceeded 1 million, accounting for about 30% of the global total.
- Through 5G/4G co-build and sharing, we have saved cumulative more than RMB270 billion for the country, reduced operating costs by more than RMB30 billion per year, and reduced carbon emissions by more than 10 million tons per year.

Premium broadband network:

- Gigabit fibre network coverage doubled to more than 200 million households.
- Broadband covered 496 million residential units and 147,000 commercial buildings
- Won the "Leading Connected Smart Home Operator" award for the year at the Broadband World Forum.

Premium government and enterprise network:

- Covered additional 59 cities, bringing the total to 307 cities, maintaining a leading position in the industry.

Premium computing power network:

- Built a new IDC architecture of "5 + 4 + 31 + X", covering 8 national hub nodes, computing power centres in 31 provinces, and "one pool per city" in 170 cities
- Published the White Paper on the Full-optical Base in the Era of Computing Power and the White Paper on Computing Power Network Programmable Services.

Social Feedback

• Won the "Award for Outstanding Contribution Group to the Beijing Olympics and Paralympics Winter Games"

• Thomas Bach, Chairman of the International Olympic Committee, praised that "the Winter Olympics has made breakthroughs in many areas, especially broadcast and communication technologies"

• More and more people feel that China Unicom's network is getting better, as reflected by a 40% decrease in complaints about the quality of China Unicom's network

Digital empowerment of industry integration achieved new breakthroughs

Relying on digital technologies such as big data, artificial intelligence and blockchain, China Unicom leverages the advantages of cloud-network integration to build a capability-generating model of "One China Unicom with integrated capabilities and operation services", and integrates the strength of the whole company to provide customers with integrated solutions and operation services, and comprehensively serves the construction of digital economy, digital society and digital government.

We made every effort to create digital products and services for industrial integration, people's livelihood services and government governance, and comprehensively enhanced corporate value and customer value:

Empowering industry integration

- Unicom Cloud ranked first in terms of growth rate in the public cloud market, and the Big Data business maintained its leading market share in the industry.
- Aiming to build the No.1 brand of "5G + Industrial Internet", the Company implemented more than 5,000 "5G + Industrial Internet" projects and more than 1,600 5G full-connection factory projects throughout the year, achieving full coverage of 20 Big Application scenarios
- Launched products such as China Unicom Mogong, Unicom Cloud Shield and network situation awareness, gradually realising large-scale replication
- The Company was the first in the industry to set up 10 industry forces covering 9 key vertical industries.

Enriching livelihood applications

- Launched "eight gold and eight silver" products such as video ringtones, Unicom assistant, China Unicom Super Definition and China Unicom Network
- In terms of smart education, the Company created 22 industry solutions to serve over 150 education industry customers across the country
- In terms of smart medical care, the Company created 6 medical industry solutions to serve over 100 medical industry customers across the country
- In terms of smart culture and tourism, the Company served more than 170 cultural and tourism management institutions at all levels, more than 200 scenic spots and more than 50 cultural and museum venues across the country.

Serving government governance

- The Company has provided high-quality services for the central e-government backbone network for 15 consecutive years, participated in the construction of 47 national private networks of ministries and commissions, and built the Big Data platforms for 15 ministries and commissions.
- The Company has completed benchmarking projects such as the National Drug Administration Cloud, Liaoning Provincial Government Cloud and Guangzhou Municipal Cloud, as well as Moutai Cloud which is a large-scale e-commerce platform. The national government cloud platform constructed by the Company was ranked the first by the relevant authorities.
- The Company also provides digital village services for more than 230,000 administrative villages.

Milestone progress in technological self-reliance

China Unicom resolutely implements innovation-driven development, focuses on core technologies and key applications, and carries out integrated innovation. China Unicom is committed to turning itself into a technological innovation enterprise, so as to achieve high-level self-reliance and self-improvement of digital technology and become an important part of the national strategic technological strength.

In terms of R&D investment, talent development and quality of achievements, the Company has achieved milestone progress in promoting high-level technological self-reliance and self-improvement:

Greater investment in technological innovation

- R&D investment for the year reached RMB14.38 billion.
- Extra RMB1 billion budget for key and core technology research and a special incentive of RMB30 million.

Greater investment in technological innovation

- The Company established the China Unicom Science and Technology Association and engaged 16 academicians as special experts of the Science and Technology Committee
- The proportion of scientific and technological innovation talents increased by more than 8 percentage points to 30%
- The National Engineering Research Centre for the Next Generation of Internet Broadband Business Application was selected as one of the first innovation bases of "Innovation China".

Higher achievements of scientific and technological innovation

- The Company has achieved ten major scientific and technological innovation achievements including "1 terminal, 1 cloud, 2 platforms and 6 networks"
- Supported High-Tech Winter Olympics to achieve more than 20 "historical breakthroughs" and "global firsts"
- Built a 5G independent innovation "test field" for the 900MHz low-band network
- The number of patents granted increased by more than 50% year-on-year, winning the silver prize for China Patent.
- Won the honorary title of "Enterprise with Outstanding Contributions to Scientific and Technological Innovation".

2 DEMONSTRATE NEW ACHIEVEMENTS AND EMPOWER THE NEW DEVELOPMENT OF MODERN INDUSTRIES

Resolutely Serve as the “Pillar” to Build a Solid Digital Base
Strive to Become the “Leader” in Supporting Modern Industries
Make Every Effort to Become the “Frontline Troop” of Innovation-driven Development
Committed to Serving as the “Escort” of Network Security
Actively Building a Win-win “New Ecosystem” for the Digital Industry

China’s modernisation needs to further smoothen the information “artery” of economic and social development, and continuously accelerate digital economy, digital society and digital government construction through the integration and innovation of digital, network-based and intelligent transformation. China Unicom unswervingly strengthens the construction of digital information infrastructure, accelerates the promotion of the integrated development of the digital economy and the real economy, regards innovation as the primary driving force for development, improves the core capability of network security, and works with all parties in the industry to win the “Group Competition” for digital, network-based and intelligent development.

Measures adopted in 2022

- Through in-depth development of co-build co-share, the Company maintained its leading position in the industry in the premium network for government and enterprises, with the total computing power of the entire network reaching 525 PFLOPS, and achieved new results in network quality.
- Based on the core capabilities of cloud, big data, IoT, AI, blockchain and security, the Company built over 16,000 “commodity flat” 5G-scale applications, and typical application scenarios covered 52 categories of the national economy, promoting the integration of digital economy and real economy.
- Implemented critical technology research in order to accelerate in fields of 5G enhanced technology, cloud computing and Big Data.
- The Company adhered to its role as a telecommunications operator during communications support for major events, rescue and disaster relief, and epidemic prevention and control, and launched products such as Unicom Mogong, Unicom Cloud Shield, and network situational awareness to continuously promote the secure and stable development of the industry chain.
- Integrating the advantages of various parties such as industry peers, equipment and terminal suppliers, channel partners, and strategic investors, China Unicom strived to win “team competition”.

Actions to be taken in 2023

- Continuing to increase investment in digital information infrastructure to bring the network quality to a new level.
- Continually enhancing solution capabilities for individuals, families, government and enterprise customers and commercial enterprise customers.
- Adhering to innovation-driven development, focusing on improving scientific and technological innovation capabilities, and addressing technological innovation as a "key variable".
- Coordinating development and security to create more independent innovation achievements, and continuously improving the resilience and security level of the industrial chain and supply chain.
- Deepening cooperation with strategic investors and industry leaders, achieving win-win cooperation in terms of business, products and capital.

Resolutely Serve as the "Pillar" to Build a Solid Digital Base

China Unicom accelerated the construction of intelligent comprehensive digital information infrastructure with the characteristics of "high-speed and ubiquitous, air-space-ground integration, cloud-network integration, intelligent agility, green and low-carbon, and secure and controllable", to build a solid digital base for economic and social development.

Construction of New Infrastructure

China Unicom pursued moderate advancement, promoted use through construction and combined construction with use, unswervingly increased investment and made every effort to make a leap from "basic connection" to "connection of all things".

Accelerating the construction of four premium networks

5G mid-band base stations exceeded **1 million**

4G population coverage exceeded **98%**

Investment of RMB **20** billion in 900MHz low-band basic network with **170,000** new base stations

390 million IoT connections

Total computing power of the whole network reached **525** PFLOPS, with more than **400** shared MEC nodes

Broadband covered **496** million residential properties and **147,000** commercial buildings

Premium government and enterprise network covered **307** cities

100% Coverage rate of mobile network in township

96% Coverage rate of mobile network in administrative villages

Accelerating the construction of premium 5G network

China Unicom fully promoted the construction of premium 5G networks, so that more and more customers can enjoy China Unicom's premium network services from prosperous cities to tranquil villages, from the roof of the world to islands of South China Sea.

• The Company joined hands with China Telecom for further co-build co-share, and worked together to create a premium 5G network with wider coverage, stronger capabilities, better quality and better experience, so as to achieve continuous 5G network coverage in rural areas and above with faster speed, higher reliability and more extensive scenarios. China Unicom's 5G base stations accounted for around 30% of the world's total.

• The Company accelerated the construction of the 900MHz low-band basic network, and effectively improved the network coverage in rural areas and remote areas.

• The Company accelerated the promotion of the ubiquitous interconnection of human, machines and devices. In April, the Company was the first to achieve IoT connections exceeding human connections, that is, the number of mobile IoT connections exceeded the number of mobile phone users. Relying on the capabilities of its independently developed Yanfei-zhilian Intelligent Connection Management Platform and Yanfei-gewu Device Management Platform, the Company provided secure and reliable terminal, network and cloud integrated services for industries such as financial payments, smart buildings, intelligent operation and maintenance of industrial equipment.

China Unicom in Yantai Shandong made use of 5G + microwave technology to open up the offshore 5G channel from Yantai to Dalian, solving the problem of no mobile phone signal in 150 kilometres offshore, which was widely praised.

5G + microwave technology to open up offshore 5G channels

Accelerating the construction of premium gigabit broadband network

The Company created a premium gigabit broadband network that connects thousands of households driven by the "dual gigabit" strategy.

• The gigabit fibre network coverage doubled to more than 200 million households, securing a leading position in the northern region and precise coverage in the southern region.

• The Company carried out cooperation for construction of broadband network. Through social cooperation with China Broadnet and private capital partners, it built 51.37 million broadband ports, accounting for 21% of the total.

• The Company launched a broadband network digital operation platform to provide a variety of convenient network diagnosis services for China Unicom's broadband subscribers, letting them fully understand the status of the network.

Accelerating the construction of premium government and enterprise network

The Company launched premium government and enterprise networks with wide coverage, low-latency and high-reliability, providing intelligent, secure and high-quality dedicated line services, and continued to maintain the industry-leading position in terms of premium dedicated line brands. The coverage extended to additional 59 new cities and reached 307 cities in total, accelerating the digital transformation and upgrading of government and enterprise customers.

Ultra-wide coverage

300+cities

Hundreds of thousands

of commercial buildings

Ultra-large bandwidth

Direct access to

dedicated channel

100 G bandwidth

readily available

Ultra-low latency

Urban latency circle

Minimum 1ms

Ultra-high reliability

1+1 Hard pipes

Up to 99.999%

Intelligent experience

Intelligent provisioning

Visible routing

Accelerating the establishment of new advantages of computing-network integration

The Company implemented the national strategy of "Eastern Data and Western Computing" to build a high-quality computing power network, build a solid base and establish a cloud-network-edge integrated scheduling system. It improved its international network capabilities, and continuously enhanced its integrated computing-network service capabilities featuring "connection + perception + computing + intelligence".

• The Company allocated cloud resource pools in accordance with the three-level structure of "5 + 4 (core) + 31 (provincial) + X (local/edge)" to accelerate the deployment of eight national hub nodes of "Eastern Data and Western Computing" in Beijing-Tianjin-Hebei, Yangtze River Delta, Guangdong-Hong Kong-Macao Greater Bay Area, Chengdu-Chongqing, Inner Mongolia, Guizhou, Gansu and Ningxia.

• The Company built a full-area all-optical network with ultra-wide coverage, ultra-large bandwidth, ultra-low latency and intelligent scheduling, created a high-quality public Internet centred on subscribers and computing power, established a smart metropolitan network with the integration of multiple businesses, and formed a layout of 13 core nodes of computing power, leading the industry in terms of network latency.

• The Company built a premium industrial Internet integrating computing and network, to provide high-quality and differentiated services for 2B subscribers.

The"Fujian-Ningxia Cloud" project of China Unicom Zhongwei Cloud Data Center was launched. As a demonstration project of "Eastern Data and Western Computing", it will create a computing power network with excellent structure, strong capacity and good experience through ecosystem integration, computing power enhancement and network speed acceleration, to support the construction of the "Western Digital Valley".

China Unicom Zhongwei Cloud Data Center

Continuous deepening of co-build co-share

China Unicom cooperated with China Telecom to comprehensively deepen the co-build co-share in 5G, 4G and basic network resources, which improved the efficiency of resource utilisation, formed leading network capabilities and promoted the high-quality, healthy and green development of digital information infrastructure.

• The scale and coverage of 5G network continued to remain comparable to the industry. The Company basically achieved continuous mid-band coverage of hotspot rural areas, towns and above. 200M capability was fully deployed in key scenarios across the country and major cities such as Beijing, Shanghai, Hangzhou and Chengdu, among which, Beijing became the first city in the world with city-wide 200M continuous coverage.

• The two parties put in service an additional 450,000 4G shared base stations, reaching 1.1 million in total. The 4G network coverage of China Unicom increased by 29.5%, with one 4G network covering indoor and outdoor in Beijing and Guizhou. Based on the remarkable results achieved with 4G co-build co-share, both parties reached a consensus to accelerate the consolidation of one 4G network.

• The Company expanded the scope of cooperation in infrastructure co-build co-share and co-maintenance, and actively promoted the cooperation in connection with trunk lines, local resources and IDC dual-line access, with the co-build co-share rate of 100% for trunk lines and over 95% for local optical cables. The two parties negotiated to formulate IDC access technology solutions, carried out dual-line access pilot projects for more than 20 provincial companies, and further promoted the cooperation in cloud-network integration, communication equipment rooms, international submarine cables, emergency support and other aspects to realise the synergy potential.

• The Company optimised the joint management mechanism and jointly developed a co-build co-share blockchain scheduling platform to strengthen the perceptual reciprocal monitoring and ensure network quality and smooth coordination.

Cumulative saved more than **RMB 270 billion** of investment for the country through co-build co-share

Reduced operating costs by more than **RMB 30 billion** per year

Carbon emissions reduced by more than **10 million** tons/year

Application of new technologies to improve quality

Through the adoption of innovative technologies, digital-driven precision construction, enhancement of intelligent operation capabilities, and improvement of operation mechanism and process, China Unicom has continuously improved the network quality.

Application of new technologies and new equipment of network

• The Company improved the high-speed mobile coverage of 5G high-speed railways, continued to promote network cloudification and centralisation of core networks, and its 5G technology won the first prize of the Science and Technology Award of the Radio Association of China in 2022.

• The Company completed the IPv6 upgrade of 4G network and simultaneously deployed IPv6 for gigabit optical network, 5G and new direct links. The Company built the industry's first security function chain (SFC) and 5G IoT IPv6 single stack pilot, and became the first in China to receive the "IPv6 +" Ready1. 0 certificate.

• The Company optimised the China169 backbone network in key directions, and newly opened 22 inter-provincial direct connection directions, with the average latency of the entire network below 29ms, maintaining its leading position in the industry.

Network and business collaboration to improve subscribers' perception

• The Company became the first in the industry to realise nationwide centralised application, end-to-end automatic scheduling and activation, and centralised monitoring and operation of 5G slicing business. The time needed for business activation was shortened from the industry average of one week to a few minutes.

• The Company carried out precise construction based on subscriber demand and combined with Big Data means, and handled a total of 7,679 cases through complaint-driven construction, resulting in 99.5% decrease in customer complaints and a significant improvement in network quality.

Building smart operation service capabilities with computing network

• The Company continued to promote resource visualisation and improve Big Data operation capability and intelligent operation capability. According to the evaluation of the National Mobile Network Quality Report (22Q3) issued by the China Academy of Information and Communications Technology (CAICT), the Company ranked first in the proportion of 5G network with downlink access speed above 100Mbps, with the highest 4G network average downlink access speed of 45.79Mbps.

• The Company continued to improve the independent implementation capability of network ICT and 5G private network business, as well as the operation capability of digital delivery to ensure the quality of services delivered.

Average broadband access speed up by **35.6%**

Best basic telecom operator for **82** consecutive months in terms of China169 network latency

Mobile IPv6 traffic accounted for **47.21%**

Fixed-line IPv6 traffic accounted for **13.5%**

Feedback from subscribers that **"China Unicom's network is getting better"**

40% decrease in complaints about **the quality of China Unicom's network**

Demonstrating Responsibility in Major Events

China Unicom firmly ensured the implementation of major national strategies and continuously polished China Unicom's reputation of "first choice of the country, government and people" in major battles such as communication support for major events, rescue and disaster relief, and epidemic prevention and control.

Supporting major events

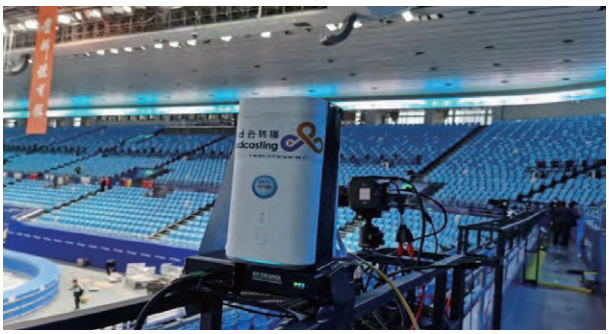
Adhering to the philosophy of "carefulness, focus, trust, excellence and intelligence", China Unicom provided 131 communication support for major national conferences and events such as the "Two Sessions", the Beijing Winter Olympics and Paralympic Winter Games, the Shanghai Cooperation Organisation Conference, the Shanghai International Import Expo, and the Launch and Recovery of Shenzhou-series Launch Vehicle in 2022. The Company achieved zero occurrence of major network security incidents, zero tampering of important websites, zero leakage of important data, and meeting people's expectations.

Communication support for the Beijing Winter Olympics Games and Winter Paralympic Games

In 2022, the world watched as the Olympic Games were held in Beijing. As the sole official telecommunication services partner of the Beijing 2022 Winter Olympics Games and Winter Paralympic Games, China Unicom has achieved more than 20 "global firsts" and "historical breakthroughs" in fields such as "smart event management, smart spectator experience, and smart athlete participation, building the most advanced digital base for a high-tech Winter Olympics.

- The Company dispatched a total of 377,800 support personnel and 166,100 vehicles, and formed 42 on-site support teams composed of 1,503 people to provide 95,000 services for the Winter Olympics Games and Winter Paralympic Games.
- The Company compiled the Winter Olympics Legacy Report and Case Collection of China Unicom to promote the replication and promotion of the technological achievements of the Winter Olympics and facilitate the digital transformation and development of various industries.

The world's first 5G HD high-speed railway studio



5G + cloud broadcast brought audience a viewing experience of 8K ultra-HD

Participating in disaster relief

In 2022, natural disasters occurred frequently in China. China Unicom made early deployment, revised its emergency communication support plans, investigated hidden dangers, carried out emergency drills, responded quickly, and took up various emergency rescue and communications support tasks. Natural disasters such as typhoon "Xianba", "Mulan", "Ma-an", "Xuanlannuo" and "Meifa", as well as the mountain torrents in Datong, Qinghai, and the 6.8-magnitude earthquake in Luding, Ganzi, Sichuan, all resulted in local communication interruptions. All units of the Company responded quickly and worked together to repair and restore damaged communication facilities in a timely manner, while meeting the urgent communication needs of the people. Throughout the year, the Company invested a total of approximately RMB55.53 million, dispatched 65,739 person-times and 23,183 rescue vehicles, and provided 3,641 emergency equipment and 14,982 emergency fuel generators for disaster relief. Through early deployment, early implementation and early prevention, there were no large-scale base station shutdowns or widespread communication interruptions in 2022, leading to a reduction of RMB375 million in direct economic losses as compared with 2021.

Personnel participating in disaster relief

65,739 person-times

Supporting scientific and technological pandemic prevention

In the face of the pandemic, China Unicom's cadres and employees devoted themselves to the front line without fear of difficulties and challenges, dedicatedly served the pandemic prevention and control to ensure the safety and smooth operation of the whole network during the pandemic, ensure the stable operation of various pandemic prevention systems, and ensure the uninterrupted customer service. The Company launched more than 20 scientific and technological anti-pandemic products represented by Digital Sentinel and Cloud Cabin, and properly conducted the communication big data digital travel record service and the protection of user privacy after they went offline, contributing China Unicom's strength to the prevention and control of the pandemic.

China Unicom's Digital Sentinel is a digital and intelligent access management product that was applied to routine pandemic prevention and control, and has served more than 20 provinces across China. In Nanshan District, Shenzhen, through the one-code verification platform, it connected with 2,000 sets of electronic sentinel information, enabled sharing of pandemic verification data, and provided services for 7 million residents in Nanshan. In Ningde, Fujian, the Digital Sentinel provided digital access management services for the government, communities, properties, schools, office buildings and construction sites.

Digital Sentinel provides
safety services for mass transit

In the spring of 2022, the pandemic in Shanghai was severe and complex. While protecting the health of employees, China Unicom Shanghai team made every effort to provide communication support and volunteer services for epidemic prevention and control, and provided material assistance to make a positive contribution to the fight against the epidemic in Shanghai.

China Unicom Shanghai Branch helped
win the battle against the pandemic

China Unicom Nankai Tianjin Branch joined hands with the communities to fight against the pandemic. The volunteer team of 91 people led by the "top leader" provided volunteer services for pandemic prevention in the community for many times, and supported the nucleic acid screening work in the communities for more than 100 times in total, serving tens of thousands of residents.

Staff of China Unicom Tianjin Branch fought against the pandemic

Strive to Become the "Leader" in Supporting Modern Industries

China Unicom gave full play to its advantages of information and communication network technology, accelerated the development of modern industrial system, facilitated the deep integration of digital economy and real economy, promoted the development of digital economy and the upgrading of information consumption, and made full efforts in the field of digital economy, so as for the whole society to further share the new achievements brought by the development of information communication.

Empowering the Construction of Modern Industries

By leveraging the advantages of cloud, Big Data, IoT, AI, blockchain and security integration, China Unicom unleashed the value of data, deeply supported modern industrial data governance and data security services. It also helped to strengthen and expand industrial Internet application products for some key industries, and supported the development of digital economy, digital society and digital government.

Supporting the construction of digital government and smart cities

Digital Government

In accordance with national policies such as the "Guiding Opinions of the State Council on Promoting the Construction of Digital Governments" and the "Guidelines for the Construction of the National Integrated Government Big Data System", China Unicom was comprehensively building its integrated digital government capabilities and product system. In 2022, the Company newly launched 44 self-developed products in the digital government field, with a total of 151 products.

The Company upgraded and created more than 300 integrated solutions, including the "China Unicom Digital Government Industry Comprehensive Solution", "China Unicom Government Service Baseline Solution" and "China Unicom Government Service Big Data Solution". With a total of more than 1,100 solutions, the Company provided full-chain digital government services from top-level design, integrated solutions, integrated delivery to operation services, which covered cloud, network, data, applications and security, with efforts to build the No.1 brand of "Unicom Service" for digital government.

At the First Digital Government Summit, China Unicom, was the sole operator working with the Guangdong Provincial Bureau of Government Statistics and the Research Institute of Digital Government to jointly release the theoretical report of "unified management with one network " for the provincial digital government of Guangdong Province, and launched the Guangdong Smart Governance Platform to help the government create multiple provincial-level topics such as economy, emergency response, agriculture and energy. China Unicom contributed to the construction of the digital government in Guangdong Province, and comprehensively helped to build the country's first "provincial governance" demonstration province.

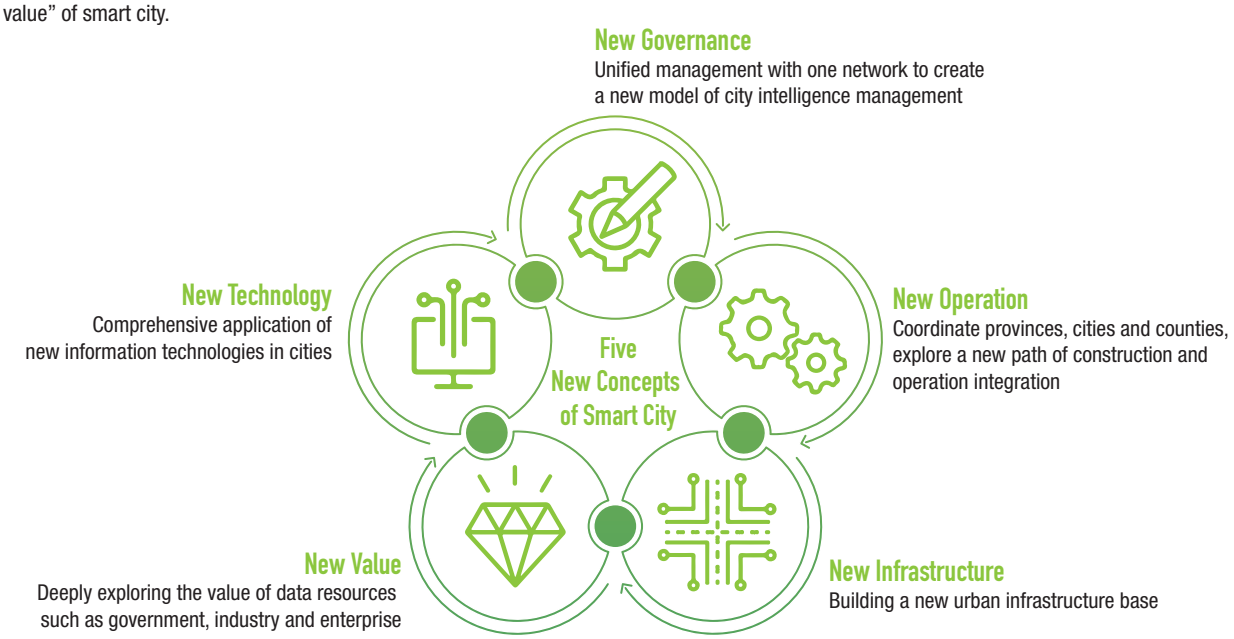
Guangdong Digital Government Provincial Governance "unified management with one network " Guangdong Smart Governance Platform

As the main force participating in Zhejiang's digital reform, China Unicom supported Zhejiang Province to build the country's first intranet big data platform for government affairs, and promoted government data to be visible, well-managed and well-used.

Zhejiang Provincial Government Intranet Big Data Platform

Smart city

China Unicom has upgraded its new smart city capability system called "CityNext" which focused on key areas such as city governance, social governance, economic governance and grassroots governance. It launched 14 key solutions, including new smart city comprehensive solutions, county-level smart city public service platform operation, "unified management with one network" for city operation, all-round integrated governance, urban economic operation services and smart community, and provided services for more than 700 projects across the country. Based on the insight into the five new changes in smart city in refined governance, platform operation, new infrastructure, data and technology application, China Unicom proposed the "five new" concepts and capability system of "new infrastructure", "new technology", "new governance", "new operation" and "new value" of smart city.



China Unicom's "Five New" Concepts in Smart City

China Unicom South District Qingdao Shandong Branch and China Unicom Digital Technology Co., Ltd. worked together efficiently to build a digital twin model for the whole-process city operation in the city's South District by using digital twin technology covering time and space data aggregation, integrated management, extraction and analysis, etc., and realised the digital management of the whole life cycle of social governance events. The platform was selected as an excellent case in the fields of grassroots governance and social governance of new smart cities in Shandong Province.

Building the No.1 brand of "5G + Industrial Internet"

Focusing on 11 key industries, China Unicom created 30 key self-developed products and 11 baseline solutions. Based on the independent innovation capabilities of 5G, cloud, Big Data, IoT, AI, blockchain and security, China Unicom integrated the independent capabilities with industrial characteristics such as identification resolution, industrial AI, 5G high-precision positioning and industrial external network, and formed comprehensive solutions with China Unicom characteristics in typical industrial scenarios such as product traceability, unmanned inspection in power plants, and one network coverage for above-ground and underground facilities. The Company established legion groups for equipment, mining, steel, automobile and clothing, integrating CT, IT, DT and OT capabilities, to accelerate the extension of industrial internet from auxiliary production to core production processes.

In the 5th "Blooming Cup" 5G Application Competition held by the Ministry of Industry and Information Technology (MIIT), the number of projects submitted by China Unicom accounted for more than 40% of the total, and the application scenarios covered 52 categories of the national economy. The Company won 5 first prizes, 13 second prizes and 20 third prizes, and the total number of first, second and third prizes ranked first in the industry.

The Company winning first prizes in
the 5th "Blooming Cup" 5G Application Competition

The "Maotai Cloud" jointly created by China Unicom Digital Technology Co., Ltd. and Guizhou Moutai effectively considered the characteristics of Maotai digital marketing APP, gave full play to the advantages of China Unicom's self-developed cloud platform and localised services, solved the problems of high elasticity of resources, high reliability of business, high concurrency of heavy traffic and high growth of data, and fully supported "iMaotai" to cope with the peak traffic test.

On the day of the launch of "iMaotai", the number of purchases exceeded 6,200,000 within one hour, and the number of instant active concurrent traffic reached 1,600,000. Wang Li, the chief engineer of Maotai Group, expressed gratitude to China Unicom, and highly praised the efforts made by China Unicom in the "iMaotai Digital Marketing Platform" for their quiet, dedicated and diligent work.

iMaotai Digital Marketing Platform

By utilising innovative technologies such as industrial Internet, identification resolution, cloud computing and Big Data, and based on the typical common needs of discrete and process-based manufacturing industries, China Unicom Jiangxi branch realised the identification resolution application model based on the industrial Internet platform, thereby meeting the deep needs of enterprises in three aspects, namely production execution, status monitoring and the integration of Big Data intelligent platform.

Industrial Internet Identification Resolution System

China Unicom Tianjin Branch undertook the 5G-empowered offshore oil project, built the first "smart factory" project for offshore oil and gas equipment manufacturing, and used 5G + smart production to enable the mutual real-time communication between the industrial brain and the underlying equipment of the smart production line, thereby realising the visualisation of the production process.

DIMS system for 5G smart factories in offshore engineering

China Unicom Jilin Branch cooperated with FAW Group, used 5G + digital twin and MR hybrid technologies combined with 3D digital sand table, to enable digital display of FAW NBD park, Hongqi production plant and Hongqi high-end vehicles. It provided the "5G + MEC + slicing" technology for the new energy factory of FAW Hongqi to meet the network requirements of diversified connection, performance differentiation and diversified communication in the automobile manufacturing process, and significantly enhanced the industrial supply capacity.

Provision of "5G + MEC + slicing" technology for the new energy factory of FAW Hongqi

Digital empowerment of livelihood services

Smart medical care

China Unicom leveraged its advantages of digital health integration and innovation, continued to further penetrate the medical and health industry, fulfilling the mission of "serving medical reform and benefiting people's livelihood", and bringing new momentum to "Healthy China". Having built a number of national, provincial and municipal demonstration projects in the fields of medical cloud, smart medical applications and health care big data, the Company used next-generation technologies such as Big Data, AI and 5G to build city-level health brain base and capabilities, and provide intelligent medical and health data services to the governments, medical institutions and industries.

China Unicom Guizhou Branch actively worked with the Affiliated Hospital of Guizhou Medical University to explore in-depth innovation in health management methods and carried out multi-level and multi-type cooperation. By deploying 5G health management terminals, including micro clinics, health check-up vehicles and health bracelets, real-time collection and remote monitoring of health data were achieved. It cooperated with Guiyang Second People's Hospital to build digital platforms such as 5G medical surgery demonstration and education platform, 5G remote ultrasound guidance system, 5G remote imaging diagnosis system, and 5G remote teaching and management platform.

Smart Medical System of China Unicom Guizhou Branch

Smart transportation

China Unicom has formed a top-level architecture of "Intelligent Vehicle-Road Collaborative System" by focusing on six key issues, including 5G private network capabilities, edge collaborative computing, secure and reliable terminals, common ability aggregation, open service capabilities, and pan-scene operation. After two years of independent research and development, the Company launched the 5G vehicle-road collaboration service platform which supports six major scenario modules including vehicle-road collaboration, remote driving and holographic perception. The platform has opened more than 300 API interfaces to meet the independent management and application innovation of multiple users and tenants.

The Company has completed more than 20 key projects, including Boao Dongyu Island Internet of Vehicles Demonstration Project, Xiongan New District Intelligent Transportation Pilot Demonstration Project, High-Tech Winter Olympics-Shougang 5G/V2X Intelligent Connected Park, Xiamen BRT5G Intelligent Connected Vehicles-Road Collaboration Project, Xining Garden Expo Park Unmanned Driving Project, Yangquan Jidong Cement 5G Intelligent Mine Unmanned Driving Project, Zibo High-tech Zone Eastern Mountain Park Intelligent Connected Project. China Unicom took the lead in building a national leading "5G + Internet of Vehicles" application demonstration base in Tianjin Haihe Education Park, Beijing Yizhuang Park and other places.

Boao Internet of Vehicles Cloud Control Platform

Ecological environment

Focusing on key areas such as water conservancy and environmental protection, China Unicom created a number of solutions such as Unicom Smart Water Conservancy and Smart Ecological Environment. It promoted the modernisation of ecological environment governance system and governance capabilities with digital technology integration and innovation, and empowered the construction of China's modernisation that promotes the harmonious coexistence of human and nature.

- With the advantages of 5G and cloud-network capabilities, the Company built a diversified and integrated water conservancy perception network, provided secure and reliable data and computing power support for smart water conservancy construction, and served the construction of digital twin water network, digital twin watershed and digital twin engineering, so as to promote the construction of the "2+N" smart water conservancy business application system, thus promoting the high-quality development of water conservancy in the new stage.
- By comprehensively utilising its core capabilities such as 5G, Unicom Cloud, Big Data, AI and blockchain, the Company built a smart ecological management platform to support scientific decision-making, systematic management, precise pollution control and convenient services in areas such as water environment, atmospheric environment, pollution sources and hazardous solid waste. This promoted digital empowerment to improve the quality of ecological environment.

China Unicom Chongqing branch expanded into the market of safety monitoring of small and medium-sized reservoirs, which is regarded as a key market. At present, it has undertaken reservoir projects in six districts and counties, namely Fengjie, Beibei, Tongnan, Rongchang, Changshou and Fengdu. By making full use of the existing conditions and taking into consideration the reservoir dam type, scale, dam height, dam length, downstream impact, communication conditions, etc., it reasonably set up monitoring facilities in accordance with relevant technical standards, properly connected with existing monitoring facilities and those constructed under reinforcement projects. This has promoted the construction of water conservancy informatisation, and played an extremely important role in the industry and agriculture, flood control, residential water use and ecological environment in various districts and counties.

Culture and tourism

On 15 December 2022, the Department of Resources Development of the Ministry of Culture and Tourism announced 10 elderly-friendly smart tourism demonstration cases. The "Travel Guizhou with One Code" and "Travel Xinjiang with One Mobile Phone" platforms built by China Unicom were both successfully selected, making it No.1 in the industry in terms of the number of selected cases. The One Code Tour platform has been launched in many provinces and cities across the country, becoming a new tool to promote the industrialisation and high-quality development of regional tourism. It has been highly recognised by cultural and tourism management institutions at all levels and tourists, creating a benchmark and model for the tourism industry to provide more elderly-friendly intelligent service products with digital empowerment.

"Travel Xinjiang with One Mobile Phone" incisive commentary and hand-drawn map functions

"Travel Guizhou with One Code" mini program and recommendation page

Smart education

With "Education Smart Brain" as the foundation of digital capabilities, China Unicom created a 5G smart education model integrating cloud, network and terminals, with dedicated efforts to promote "5G + smart education". With 15 self-developed smart education products, the Company has built smart education applications such as 5G campus network, smart classroom, educational big data (including Education Smart Brain) and campus management platform. More than 200 benchmarks for smart education application have been established, such as the digital base of Shanghai Municipal Education Commission, smart examination platform of Zhejiang Province, Harbin Institute of Technology Supercomputing Centre, and Xi'an Electronic and Technology University smart campus operation platform, to facilitate the development of education in a fair, personalised and intelligent manner.

China Unicom's "Interactive Class for Luwan High School in Shanghai and Zunyi No.5 Middle School, based on 5G + Holographic Technology" and "China Unicom IOC Platform Supports '5G+Green Campus' of Xi'an Electronic and Technology University" were selected as the annual typical cases of "5G + Smart Education" at the China 5G Development Conference 2022. With the help of 5G and holographic technology, students from Luwan High School in Shanghai and No. 5 Middle School in Zunyi, Guizhou Province attended the same class through the Internet.

5G Holographic Smart Classroom at Luwan High School, Shanghai

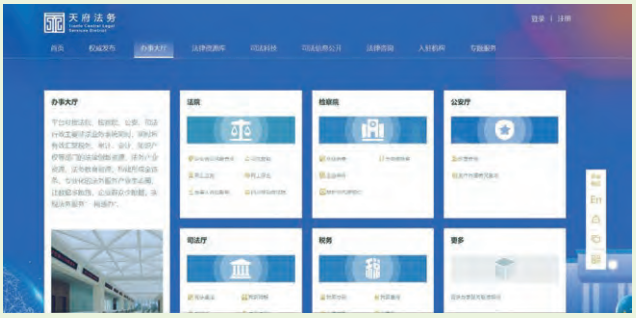
China Unicom Zhejiang Branch collaborated with China Unicom (Zhejiang) Industry Internet Company Limited to build a city-level education brain and a "dual-reduction" platform with the integration of Big Data governance system and AI algorithm as the core, empowering the "dual-reduction" reform with digital intelligence.

The application of smart pick-up and drop-off at the Jindong District Second Experimental Primary School

Smart legal services

China Unicom is committed to serving the rule of law in China with data-based, network-based and intelligent technologies. It integrated the next generation of information technologies including 5G, IoT, cloud computing, Big Data and blockchain to provide full-chain applications and services such as new legal infrastructure, political and legal data security and digital legal services for political and legal institutions and industries, and to provide the public with convenient and efficient notary services.

On 22 April 2022, China Unicom, together with the Political and Legal Committee of Sichuan Provincial Party Committee, Sichuan High People's Court, Sichuan Provincial Department of Justice, Sichuan Tianfu New District Management Committee and other units, officially launched the smart judicial science and technology innovation centre, and simultaneously released the "Tianfu Central Legal Cloud" and "Tianfu Central Legal Chain". The smart service platform of Tianfu legal services has become an important window for publicity and display of the central legal area of Tianfu. The smart service exhibition hall has held more than 300 events for visitors from all over the country.



Smart service platform of Tianfu legal services, Sichuan

Smart emergency response

China Unicom focused on building a digital capability matrix for emergency response covering the whole country with new mechanisms and new models, and continued to explore and practise in the informatisation of emergency management. The Company focused on five key directions, namely emergency command and rescue, safe production, natural disaster prevention and mitigation, smart fire protection, and urban safety risk monitoring and early warning, to build China Unicom's smart emergency products and capabilities system, and promote the deep integration of digital technology with the national needs for emergency management business and secure development of cities.

- The Company has applied satellite remote sensing, Big Data, AI and other technologies in Anhui province, Nanchong Sichuan province, Lianyungang Jiangsu province and other provinces and cities to assist the emergency management department to build disaster risk monitoring and early warning systems, emergency coordination and command systems, comprehensive application systems and supporting systems, so as to improve the capabilities of monitoring and early warning of major disasters, emergency command and rescue and comprehensive disaster prevention and mitigation.
- The Company provided emergency management departments with analysis and data services in relation to population transfer, centralised resettlement and personnel return under flood and typhoon disasters.

Unicom Cloud Empowers Industry Transformation

Unicom Cloud continued to promote product breakthrough, comprehensively upgraded to the next generation of cloud computing platform, and launched three different versions of Unicom Cloud version 7.0, namely "Unicom Cloud 7.0 Industry Cloud", "Unicom Cloud 7.0 Private Cloud" and "Unicom Cloud 7.0 Information Technology Innovation Cloud". With the unique advantages of "security and reliability, cloud-network integration, tailored customisation, affordability and practicability, and multi-cloud collaboration", "Unicom Cloud 7.0" has achieved four major technological breakthroughs.

1 Further upgrade of dual-engine structure

Achieved One-Cloud Polymorphism with unified structure, CULinux operating system and IPv6 + integrated into the dual-engine internal core

2 New breakthrough in performance

The number of single-cluster concurrent computation exceeded 10-million-level QPS, and the cloud-native container platform was the first to pass the excellent certification in China

3 Independent and controllable security and reliability

100% self-developed full-stack products to fully meet the requirements of information technology application innovation

4 Further expansion of industry capacity

Accumulated more than 100 industry PaaS modules, and formed a rich variety of scenario-based solutions around seven scenarios cloud to fully empower the digital transformation of industries

Unicom Cloud drove the rapid growth of "Big Computing" and established the brand image and good reputation of "Secure Digital Intelligent Cloud". Its public cloud recorded the highest growth rate, and the national government cloud platform constructed was rated the first by relevant institutions. The cloud-native container platform was rated as an advanced level in the first batch of cloud-network integration comprehensive capacity assessment of CAICT, and was the first operator awarded with excellent level certification by CAICT, and passed the zero-trust security certification of CAICT.

At the 2022 China Unicom Partnership Conference with the theme of "Digital and Intelligent Connectivity for All", Mr Liang Baojun, Senior Vice President of China Unicom, officially released the brand-new and upgraded Unicom Cloud version 7, which formed a wide range of scenario-based solutions based on seven major scenario cloud, fully empowering the digital transformation across various industries.

Unicom Cloud version 7 was officially released

Building a Systematic Capability System

Focusing on the key direction of industrial digitalisation, China Unicom has established nine industry forces, namely equipment manufacturing, smart mining, smart steel, apparel manufacturing, automobile manufacturing, smart medical care, smart legal services, smart emergency response and smart transportation. Based on its independent capabilities such as 5G, cloud, Big Data, IoT, AI, blockchain and security, the Company independently developed 26 industry-specific products and created more than 150 industry solutions. The Company set up more industrial Internet companies in 8 provinces including Beijing, Hunan and Hainan, and together with the original 11 industrial Internet companies, basically realised the Company's deployment in the eastern provinces of the Heihe-Tengchong Line. Taking the opportunity of establishing industrial Internet companies, the Company took part in the local digital economy construction.

Make Every Effort to Become the "Frontline Troop" of Innovation-driven Development

China Unicom adhered to the innovation-driven development to serve the national strategy, adhered to the "two-wheel drive" of market and innovation, firmly grasped the direction of digital, network-based and intelligent transformation, and accelerated the construction of a technology engine to drive the high-quality development of the Company in the new era, becoming an essential part of the national strategic scientific and technological strength.

Deepening the Innovation of Scientific and Technological Innovation Mechanism

China Unicom further deepened the reform of the scientific and technological system, improved the scientific and technological innovation system, built an efficient scientific research and development system, optimised the scientific and technological innovation organisation, improved the efficiency of the innovation system, and strived to stimulate the innovation vitality. In 2022, the Company strengthened the basic management of scientific and technological innovation, promoted the overall management and transformation of the entire process of scientific and technological achievements, increased investment in research and development, and strengthened the protection of intellectual property rights.

In 2022, the total R&D investment was RMB**14,380** million, accounting for **4.03%** of the revenue.

In 2022, **2,672** patent applications were filed and **1,666** patents were granted, with **5,726** patents valid in China.

There were **18,905** R&D personnel in total, with **one** academician.

• The Company established the China Unicom Science and Technology Association to build a warm home for scientific and technological workers, and 16 academicians were appointed as special consultants.

• The National Engineering Research Centre was included in the national new sequence management.

• The Company launched the second phase of platform for the transformation of scientific and technological achievements, organised recommendation and training for China Unicom's scientific and technological achievements of the incubation period, promoted the achievements of the incubation period to mature as soon as possible, and finally achieved net benefits through transformation.

• The Company attached great importance to and strengthened the protection of intellectual property rights, continuously improved the intellectual property management system related to the creation, application and protection of patents, and increased the capital and human resources investment in intellectual property rights. Both the quantity and quality of intellectual property rights have been greatly improved.

Establishment of China Unicom Association for Science and Technology

Strengthening Core Technology Research

China Unicom played a leading role in the technological innovation of central state-owned enterprises, actively served as the "source" of original technologies, bravely broke through the "no man's land" of science and technology, and accelerated the breakthrough of "bottleneck" technologies in important fields.

Undertaking major national scientific research projects

The Company continued to take the initiative to undertake national science and technology projects. In 2022, the Company was awarded 30 national science and technology projects, taking charge in 2 leading projects and 9 topics. The Company took the initiative to undertake the high-quality development project of the Ministry of Industry and Information Technology, and has been approved for 9 industrial chain collaborative innovation projects, including taking the lead in 1 project, mainly involving 5G LAN core network, industrial Internet edge intelligence, domestic artificial intelligence development and network security.

China Unicom Research Institute took the lead in applying for the "High-level Self-Intelligent Network Architecture and Key Technology Verification" project, and was successfully selected for the open test project of the National Major Technology Infrastructure Future Network Test Facility (CENI), which is the first national major science and technology infrastructure in the field of networks and information in China. China Unicom has implemented innovative practices in self-intelligent networks in a number of areas, covering five process domains: planning, construction, maintenance, optimisation and marketing.

Overcoming the "bottleneck" technologies

China Unicom has organised and implemented critical technology research in order to accelerate the advantages in new generation network, 5G enhancement technology, cloud computing and Big Data.

CUBE-Net3.0 accelerated its implementation

CUBE-Net3.0, based on 5G and looking at 6G, integrates new technological elements such as cloud-native and edge computing into the development of the network, strengthens the deep integration of different technologies and industrial elements, and is a new generation of digital infrastructure based on the network. Focusing on the CUBE-Net3. 0 network architecture, the Company made breakthroughs in core technologies in transmission, IP carrier, core network, edge industrial computing network, computing network brain and credible computing power trading, and achieved a number of results.

• The key technological innovation achievements of "IPv6 +" reached the international advanced level and won the "2022 World Internet Leading Scientific and Technological Achievement" award, one of the only 15 awards worldwide.

• The innovation results of the all-optical self-intelligence network have become the first systematic innovation of the technology system for the whole-optical business network intelligence and security in the industry.

"IPv6 +" standard formulation, equipment development, networking design and large-scale application project won the "2022 World Internet Leading Scientific and Technological Achievement" award

Evolution of 5G enhancement technology

China Unicom promoted the innovation of its "CUBE-FLEX AIR" technology system and solutions, and led a number of major special projects, such as "Constructing Reliable 5G Communication and Advanced Network Demonstration in Complex and Extreme Conditions" and "CUBE-FLEX AIR Technology System, Key Technology Research and Application Demonstration for 5.5G Evolution". The Company formulated the introduction strategy and deployment plan of 5GC enhancement capability to support the Group to promote the introduction of some high-priority 5GC enhancement capability and continued to build the competitive advantages of China Unicom's 5GC network differentiation capability, so as to facilitate the evolution of the Group's 5G network and the implementation of the 5G Application Sailing Action Plan.

The live broadcast event "Add a little bit to China in 2023 - Live streaming of 'professional island builder' to reclaim the sea and expand the land for our motherland" was exclusively provided by China Unicom with 5G technical support and communication service support. The Company achieved high-quality 5G network coverage in the sea areas and land reclamation areas near the route of the Sky Whale, providing low-latency and zero-lag 5G network experience for global netizens to closely watch the live broadcast of the powerful vessel, which further demonstrated the advanced strength of China's 5G network and reflected the effective integration and synergy of 5G new infrastructure and traditional infrastructure.

Global live streaming of Sky Whale, the "professional island builder", with 5G empowerment by China Unicom

Breakthrough in Big Computing technology

Through key technology research for computing-network integration, the Company designed and developed computing-network integration and scheduling technology, wide-area distributed storage technology and cloud-based network hardware unloading technology, and launched cloud products that support computing-network integration and scheduling, ultra-high performance ECS products, and Unicom Cloud smart operation and maintenance platform. The Company has mastered the computing-network integration and scheduling technology and wide-area distributed storage technology based on latency circle or geographical location, solved the problem of terminal access to distributed services or data in the vicinity, and realised the first breakthrough of virtualised cloud products and cloud-native products that support latency circle scheduling in the industry.

Increasing influence of Big Data

The Company carried out research on key technologies for trusted data resource space, and overcame the cutting-edge key technologies in the fields of massive data intelligent governance and services, multi-party data mutual trust and exchange, and security monitoring. It solved the data transfer service problems among data value parties, regulators, operators and auditors, made up for the shortcomings of data sharing security, realised the maximum value of the whole life cycle of data generation, transmission, transformation and creation, and improved the technical capabilities and influence of the big data industry.

Tracking the trend of forward-looking technology evolution

Quantum information technology research

China Unicom actively participated in the standardisation of quantum information in domestic and foreign standard organisations, served as the deputy leader of Quantum Communication Special Task Force (ST7) of China Communications Standards Association, and participated in scientific and technological innovation research organisations such as Quantum Internet Industry Alliance (QIIA) and Quantum Technology Industry-University-Research Innovation Alliance (QIC), to promote the development and application of quantum technology. The Company focused on the research on the practical application of quantum communication, proposed a low-cost end-to-end physical layer hybrid networking architecture, promoted the implementation of the quantum key cloud platform in new business applications, continued to follow up the miniaturisation development of the quantum key distribution (QKD) equipment, carried out the development of equipment integrating quantum and classic communication, and combined the quantum random number generator (QRNG) with the post-quantum cryptography (PQC) to provide quantum secure communication solutions with high security level and low cost, thus empowering the endogenous security of the optical networks.

Exploring 6G network technology

Through the research and analysis of the vision, needs and potential challenges of 6G network, China Unicom refined the key capability requirements of 6G core network, and further carried out targeted follow-up research and capacity reserve for 6G network architecture and key technologies such as 6G distributed autonomous architecture, network endogenous intelligence, air-ground-sea integration and digital twin, laying the foundation for subsequent standardised research and application deployment of 6G. The Company promoted the pilot test of 6G technology, completed the industry's first liquid crystal-based reconfigurable intelligent surface prototype verification and application demonstration, the world's first integrated AAU sensing application demonstration, and the industry's first terahertz real-time system verification and application demonstration based on real business scenarios.

Participating in the formulation of international and industry standards

In 2022, in the context of complex international environment, China Unicom overcame the impact of the pandemic and continued to strengthen cooperation with international organisations, further enhancing its influence in the international network space.

- The Company led the establishment of 35 international standards, concluded 29 projects, and was newly elected as the deputy rapporteur of an ITU-T research group.
- The Company organised and completed the development and testing of the Group-level R&D project "Open Source Custody Platform and Developer Community" and passed the project acceptance.
- The Company organised and recommended the object storage project self-developed by China Unicom's production system, YIG, to be included in the "Innovation China" Open Source Innovation List 2021 of China Association for Science and Technology.

Responsibility performance indicators	2020	2021	2022
Number of patents applied (item)	1,734	2,224	2,672
Number of patents granted (item)	518	1,128	1,666
Number of newly added completed items for leading international standards(article)	23	25	29
Number of newly added completed items for leading industry standards (article)	37	38	71

China Unicom won 1 Silver Award and 1 Excellence Award in the 23rd China Patent Award, achieving new breakthroughs in national patent awards. The Silver Award Patent "Method and Device for Isolating Bandwidth of Convergers" is a basic type of patent in broadband communication system, and has achieved significant social benefits in terms of spectrum utilisation, co-build co-share, and other areas.

Further Promoting the Digital and Intelligent Transformation

With the targets of improving efficiency, quality, perception and return, controlling risks, while strengthening innovation, China Unicom has built a new digital and intelligent operating system featuring "one-network management, integrated operation and one-screen handling". The Company systematically promoted the digital transformation and reform throughout the entire production, operation, service, and management process for all customers, including To C, To H, To B, and To G, as well as headquarters, provinces, cities, districts, and counties. With the goal of creating ten landmark achievements, China Unicom accelerated the construction of a "one Unicom, integrated capability aggregation, and integrated operation services" feature capability matrix to significantly improve frontline work efficiency internally and enhance digital service capabilities externally. The company has received full recognition from supervisory authorities, international organisations, and industry alliances, further highlighting its role as a "toolbox" and "booster" for high-quality development.

Creating an intelligent operating system

China Unicom has built an intelligent operating system focusing on five elements, including scenes, tools, platforms, data, and processes. By empowering intelligent operations with technologies and data factors, China Unicom has comprehensively achieved its goal of "improving efficiency, quality, perception, return, and controlling risks while strengthening innovation", which has helped the Company's business development to continuously improve.

Improving efficiency

Significant improvement in intensive operation capabilities for all customers, with 'Headquarters + Provinces' centralised operation rate exceeding 50%; significant increase in broadband online and offline conversion rate

Improving quality

Integration and collaboration of customer, network, business, and service data, with significant improvement in the precise services provided to customers by the four premium networks

Improving perception

The mobile terminal-network-business alignment rate increased by 10.3 pp year-on-year, and the broadband terminal business alignment rate increased by 11.4 pp year-on-year

Improving return

The utilisation rate of existing broadband ports increased by 4.8% year-on-year

Controlling risks

The data security reached the level of "excellent" in the assessment of data security governance capability

Strengthening innovation

The self-developed rate of core systems increased by 6.4 pp year-on-year, and the proportion of digital talents increased by 1.2 pp

Consolidating digital capabilities advantage

China Unicom adhered to independent research and development to build digital intensive capabilities, The top-level planning and front-line innovation were organically combined to maximise the value of common capabilities. China Unicom developed the Unicom Intelligence Brain as the core engine for comprehensive digital transformation.

Newly released China Unicom Intelligent Brain 2.0	In the five areas of core communication service systems, centralised smart customer service, intelligent middle platform, big data base, and digital foundation, on the basis of 100% centralisation, cloudification, integration, and empowerment the brand new Unicom Intelligence Brain 2.0 has been launched. Unicom Intelligence Brain 2.0 is a brain-like decision-making and command center that combines AI technology, cloud computing, big data capabilities with business, network, service, and management. It is supported by five major APPs, five major operating platforms, and five major middle platforms, and brings together the capabilities of large-screen "one-network management", medium-screen "integrated operation", and small-screen "one-screen handling". It connects with hundreds of thousands of employees, millions of channels, tens of millions of network element nodes, and billions of customers in a digitalised manner, and the digital capabilities have shifted from "usable" to "easy to use".
Enhancing technological innovation capability in data.	China Unicom adhered to technology innovation as the driving force. The Company has improved its independent control over core technologies and achieved a dual increase in R&D capacity and the proportion of self-developed technologies. The Company has solidified its unified digital R&D platform, supporting cloud-based R&D by 32,000 employees, 2.67 billion lines of cloud code, 8,000+ shared cloud capabilities, and an average of 1.4 billion capability calls per day. The Company has achieved deep application of artificial intelligence and big data, with a smart customer service ratio of 83%, a 61.2% intelligent diagnosis rate for core digital system faults, and 30,000 network operation and maintenance fault tickets automatically dispatched by AI every day, improving network maintenance efficiency by 145%.

Activating the value of data factors

Data factors are the core foundation of enterprise digital transformation. China Unicom attached great importance to the construction of data infrastructure and systems, activated the vitality of data factors, empowered intelligent operations, and initially formed a new data governance ecosystem of "everyone for me, I for everyone" in China Unicom.

Further improvement of data governance system

The Company proposed to adopt the principle of "one set of system standards, one data middle platform, and one set of governance methods," and to innovate the "seven-step work method" for data governance. The Company established a data governance working group consisting of the Group and all 31 provinces, completed full data accountability. China Unicom participated as a deputy leader in the SASAC's data sharing project, and was awarded the "Top 10 Famous Chinese Data Management Enterprises" by the China Electronic Information Industry Federation.

Continuously enhancing data supply capacity

The Company cracked the BO bottleneck problem. The data middle platform aggregated BOM all-domain data, which doubled in scale. The Company upgraded its data development and utilisation capabilities, greatly improving the activity rate of common labels and the usage rate of high-quality labels. Compliant circulation of data sharing achieved a 20% increase in availability due to significant improvements in the quality of key scenario data.

Outstanding results in scenario-based data empowerment

The Company promoted the deep integration of Big Data and smart operations, drove the flow of data into various intelligent operation scenarios such as value operations for all customers, government and enterprise customer value operations, network resource visualisation, and management efficiency improvement, fully leveraging the multiplier effect of data.

China Unicom Liaoning Branch actively adapted to the trend of digital transformation of the economy and society and fully released the benefits of digital development. The Chaoyang City Brain Project built a "horizontally to the edge and vertically to the bottom" architecture system which connects not only applications of digital government platforms at the provincial level, but also the applications and data resources of digital government at the county level and town level, as well as various ministries and commissions at the municipal level, realising the unified construction and coordinated promotion of key information infrastructure and core applications.

City Brain Data Intelligent Management Platform of Chaoyang, Liaoning Province

Improving process governance efficiency

China Unicom focused on empowering smart operations, promoted the transformation of traditional processes centred on management and control to customer-centric digital processes, forced the reform and organisational optimisation of smart operation processes, and created a streamlined and efficient digital process, achieving significant improvement in front-line perception, management efficiency, and convenient business handling.

Optimising process governance system.

The Company published the "China Unicom Process Management Measures" and established a process management platform based on the closed-loop management of "management elements". It was recognised twice as a classic case of process governance in the "Three-Year Action Briefing on State-owned Enterprise Reform" by the State-owned Assets Supervision and Administration Commission of the State Council. The Company participated deeply in the development of industry standards for process governance maturity by the Ministry of Industry and Information Technology.

Deepening the transformation of intelligent operation process

In 2022, the Company completed the transformation of key intelligent operation scenarios, and the end-to-end operational steps for core public services from sign-up to fulfilment were streamlined by 29%, improving the perception experience. The entire process of the government-enterprise dual-line business BOM is now visible and integrated, and the centralized business operations released more than 50% of non-sales manpower for government-enterprise frontline customer managers, improving production efficiency. The process governance drove the solution of critical problems for frontline staff and customers, with a resolution rate of 87.5%, and a satisfaction rate of 88.2% for process improvements at the frontline.

Committed to Serving as the "Escort" of Network Security

Adhering to the overall national security concept, China Unicom has identified "Big Security" as its main responsibility and main business, took practical actions to fulfill its responsibility as the "national team, key force and frontline troop", and built the "No. 1 security shield of the country, government and people" for the digital economy.

Improving core security capabilities

China Unicom focused on improving its core capabilities of network security and strengthening its strategic deployment. By sorting out more than 200 key points of network security technology, the Company drew a "product map of the modern industrial chain of network security (based on new digital information infrastructure)", which has included more than 150 security products in total and 73 of which were put into commercial use. The Company launched products such as Unicom Mogong, Unicom Cloud Shield and network situation awareness, making ten milestone achievements, and building the "No. 1 security shield of the country, government and people" for the digital economy.

Actively promoting and forming scientific and technological innovation achievements

China Unicom actively responded to the strategic needs of national scientific and technological innovation, took the responsibility of building a Cyber Superpower and scientific and technological innovation, strived to break through the key core technologies of network security, cultivated international standards, and continued to lead the technological development direction in the field of network security. The mutual recognition of products was completed with more than 160 certificates of mutual recognition. The Company vigorously promoted the formulation of standards in the field of network security, and completed the establishment of 3 international standards and published 4 concluded projects.

China Unicom continued to strengthen the security capability reserve of new technologies and new business forms such as 5G, Big Data, AI, blockchain and industrial Internet, and strived to build the basic security capability of cloud, network, Big Data, AI, blockchain and security integration. Unicom Cloud was fully upgraded to a secure digital and intelligent cloud, and a new proprietary and controllable Unicom Cloud Operating System version 3.0 was launched, fully adapted to more than 90% of mainstream software and hardware products. Unicom Cloud Shield, developed by China Unicom, provides integrated high-quality security services for top customers such as national ministries, banks and the Internet companies as well as small and medium-sized enterprises.

Strive to create high-quality products and core capabilities

China Unicom strengthened the construction of network security system, promoted the development of basic network security platform, opened security scenarios, improved product systems, led the industrial ecosystem, built cloud-based and intelligent core security product capabilities, and accelerated the marketing of innovative products. The Company promoted the development of basic network security platform and completed the platform development of five capabilities, namely asset mapping, threat monitoring, threat warning, threat intelligence and attack traceability. The Company initially established a threat intelligence centre platform and its own intelligence production system to build a safe and reliable ecosystem for governance of black and grey industries. The Company cooperated with 12 enterprises to create the "Security Cloud Market" and launched 50 products.

Strive to win the "team competition" of industry collaboration

China Unicom adheres to "bringing in" and "going out" to create a good industrial ecosystem through alliance operations, seminars and exchanges, and industrial fund operations. The Company communicated with nearly 50 enterprises and colleges in key technology research, work organisation form, construction of security laboratory, construction of industrial park, talent training and enterprise cooperation.

Using industrial innovation funds	The Company gave full play to its role in supporting and promoting the modern cybersecurity industry, gathered various innovation elements and resources to promote the coordinated development of the industrial chain. At present, the Company has established relevant industrial innovation funds, and will continue to increase investment in the future to continuously promote the secure and stable development of the industrial chain.
Operating industry innovation development alliance	The Company cooperated with Pengcheng Laboratory to build the first 5G security range in China. Under the guidance of MIIT and SASAC, the Company operated the China Cybersecurity Industry Innovation and Development Alliance and served as the chairman unit, worked with nearly 400 partners to build a strong network "New Great Wall". The Company initiated the establishment of the China Unicom Information Technology Innovation Alliance and held two sessions of Central State-owned Enterprise Information Technology Innovation Salon and two closed-door technical seminars.
Establishment of the Expert Advisory Committee	The Company organised closed-door seminars for industrial experts and advisory committee meetings for experts, and invited representatives from nearly 20 upstream and downstream enterprises in the industrial chain, as well as renowned experts and scholars in the security field to attend the meetings.

Consolidating the Cybersecurity Lines of Defence

China Unicom unswervingly implemented the overall national security concept, thoroughly implemented the Cyber Security Law, the Data Security Law, the Personal Information Protection Law, the Anti-Telecom Network Fraud Law, the Regulation on Protecting the Security of Critical Information Infrastructure and other laws and regulations, in order to better coordinate development and security, and build a proactive defence and joint defense and control system that is routine, practical, centralised and intelligent. It comprehensively improved the comprehensive support capability of network security, built a defence line for network and information security in the digital era, effectively protected the sovereignty, security and development interests of cyber space, and served as a main "escort" for the protection of China's modern network security.

Strive to forge a "protective net" for a strong network

China Unicom continued to build a network security protection system for the entire network. The Company established a network and information security operation centre and an anti-fraud command centre (SOC), which efficiently linked with 52 branch command centres, operated 12 security scenarios on a regular basis, carried out emergency command and dispatch, and implemented 7×24 hours on duty. In 2022, the Company carried out 10 attack and defence drills, 5 whole-process emergency drills and 37 phishing emails drills, and continuously improved the timely handling rate of security incidents.

Emergency Command and Dispatch Centre

Resolutely protecting data security and user privacy

China Unicom thoroughly implemented the requirements of laws and regulations such as the Data Security Law and the Personal Information Protection Law, carried out data security management in all scenarios, innovatively created a data security operation mechanism with the characteristics of operators, and continuously improved the level of data security governance. The Company improved the data security regulation system, issued the Administrative Measures for Data Security of China Unicom, the Administrative Measures for Personal Information Protection of China Unicom, the Administrative Measures for Data Security of China Unicom's Partners and other administrative measures and corporate standards, to clarify the requirements for data security protection, personal information rights protection and data life cycle protection, laying a foundation for the construction of a compliance management system for data security and personal information protection.

Continuous efforts were made to strengthen centralised security capabilities. By fully leveraging its advantages in IT and data centralisation, China Unicom accelerated the nationwide coverage of eight data security capabilities, including data encryption, data desensitisation and data traceability. The Company has built a nationwide sensitive data monitoring and operation mechanism covering 31 provinces, established data security situational awareness capabilities, carried out in-depth operation monitoring, and achieved "early detection, early intervention and early treatment" of data security incidents, effectively protecting the security of important data and subscribers' personal information.

Strive to improve the competency of industry data security talents. Under the guidance of MIIT, the Company solidly promoted the "Talent Strengthening Foundation" programme for the telecommunications and Internet industries, and created a set of industry standard post system, a series of professional excellent course system, a number of top-notch teachers in the industry, and a set of industry-leading knowledge management platform, covering more than 100 enterprises. The Company was recognised as one of the first talent training units under MIIT's data security "Talent Strengthening Foundation" programme.

China Unicom Digital Technology Co., Ltd. built a data security support system covering the whole life cycle of data, continued to build platform integration capabilities, focused on five centres of "data assets, alarms, capabilities, operations and users", formed the integration of "assets, risks, behaviours, evaluation, control and operation". It completed the integration and connection of capability modules, realised the integration and innovation of new technologies such as blockchain and AI with data security, and comprehensively guaranteed the secure and orderly circulation and transmission of data factors. In 2022, the Company was awarded the highest level of "Data Security Governance Capability" (DSG2.0) by the CAICT; four data security products were awarded the first batch of certification of "Trusted Digital Security" by the CAICT. The Company participated in the preparation of local standards, group standards, industry standards and national standards, accumulating a total of more than 70 items; obtained a number of best cases in the industry. The data security support system has served a number of provinces and cities such as Zhejiang, Anhui, Hainan, Guangdong and Sichuan, realising full-network and full-link data security protection at the three levels of "provincial, municipal and county/district".

Data Security Situational Awareness Platform

Preventing and combating telecommunications network crimes

China Unicom protected the legitimate rights and interests of subscribers, deeply pushed forward the fight against telecom fraud. The Company strengthened source management and control, regulated operation and development, deepened the construction of two-level anti-fraud special teams, and promoted key tasks such as "card-breaking operation 2.0" and "cat-fighting" operation in an orderly manner. The Company assisted the police to break a large number of criminal bases. The Company carried out in-depth anti-fraud publicity and sent a total of 5,660 million text messages for public welfare and early warning to improve the public awareness of fraud prevention.

The Company launched products such as Mobile Manager and Unicom Assistant to provide subscribers with services such as declining calls, intelligent answering and anti-fraud business cards. The subscriber scale increased by 33% compared with the beginning of the year, effectively improving subscriber perception. The Company continued to improve its Big Data anti-fraud ability and intercepted 100 million international fraudulent calls and 300 million fraudulent messages, with a significant decrease in the number of reported cases and fraud calls, effectively safeguarding people's property safety.

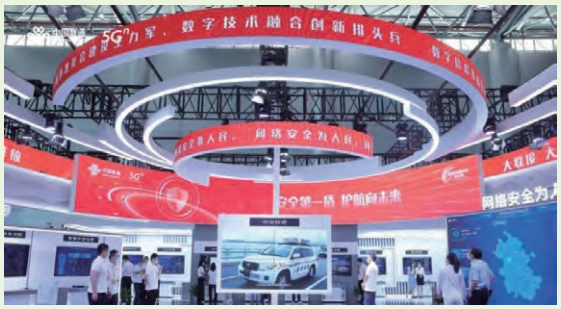
The Company strengthened the construction of public cybersecurity threat monitoring and handling capabilities, enhanced the nuisance calls management capabilities and malicious messages management and control capabilities, and realised the whole network coverage of monitoring and disposal of fraudulent calls, harassing call and spam messages. The Company improved its basic capability of monitoring, analysing and handling cybersecurity threats, thereby enhancing the security perception and experience of public customers.

China Unicom Hunan Branch promoted the whole chain and built a solid barrier for fraud prevention and control. In response to the new simple networking GOIP that has been rampant this year, the Company formulated the risk control model for simple networking GOIP and cooperated with the police to carry out the cat-fighting actions. We sent more than 400 data clues to the police, and helped them destroy more than 300 fraud-related bases and seize more than 900 GOIP (including simple networking GOIP) devices, which effectively curbed the rampant fraud with GOIP, and won praise and gratitude from public security systems all over the country. The effectiveness of the "cat-fighting action" ranked third in the industry nationwide and achieved remarkable results in proactively fighting telecom network fraud.

Carrying out cybersecurity and information security publicity and education

Based on activities such as "National Cybersecurity Publicity Week", "National Security Education Day" and "Anti-fraud Publicity Month", the Company carried out customised publicity and education activities focusing on cybersecurity, data security, cloud security, 5G + industrial Internet security, personal information security, and prevention and control of telecom network fraud. The Company has carried out more than 300 activities with the theme of "entering communities, villages, campuses, enterprises and families", and sent 5,660 million text messages for public welfare and early warning to advocate the public awareness of cybersecurity and to create a safe, healthy and civilised network environment.

At the Cybersecurity Expo held in Hefei, Anhui Province, China Unicom comprehensively displayed its innovative applications such as cybersecurity situational awareness, telecom network fraud situation, anti-fraud business cards, Unicom Cloud Shield anti-DDoS pioneer, data security, and Anhui featured products. The Company showed real cases and data to the public to bring a new experience of smart security in the digital era to the participants, which was reported by many mainstream media.



Cyber Security Expo

Effectively Ensuring Production Safety

The Company strictly abides by the Production Safety Law of the People's Republic of China and other relevant laws and regulations. China Unicom adhered to the overall national security concept, implemented various important requirements, actively promoted, cooperated with and supervised related aspects of production safety, investigated and rectified various potential risks, prevented and curbed various safety production accidents, and effectively protected and safeguarded the legitimate rights and interests of employees. The overall safety situation was stable, and the safety level continued to improve. While carrying out emergency rescue and disaster relief work, the Company also improved the safety awareness of frontline staffs, strengthened self-protection and effectively ensured the personal safety of emergency rescue and disaster relief personnel.

- During the year, the Company held seven national safety production work meetings, carried out large-scale inspection and rectification of safety production, promoted two rounds of safety production inspections and various special work, and successfully completed the Three-year Action Plan for Special Rectification of Safety Production. A total of more than 122,000 places were investigated, and 21,900 hidden hazards were found, with a zero-fatality rate per thousand people. There were no lost days due to work-related injuries.
- The Company revised and improved basic systems such as the Measures for the Supervision and Administration of Production Safety of China Unicom and the Measures for the Administration of Fire Safety of China Unicom.
- The Company carried out the pilot construction of the "double prevention system" and "safety production standardisation and corporate safety culture", and has established the "3 systems, 2 lists, 2 pictures, 3 notices" visualised information and 1 information platform for the double prevention system.

131
training sessions held on safety production

100%
coverage on safety production training

Actively Building a Win-win "New Ecosystem" for the Digital Industry

China Unicom actively joined hands with its partners to forge ahead with courage and perseverance. Facing the strategic opportunities brought by the simultaneous resonance of China's modernisation and the new generation of digital revolution, China Unicom made joint efforts to win the "team competition" for the high-quality digital, network-based and intelligent development, and made joint efforts to embark on a new journey of China's modernisation.

Cohesion for Win-win Development

China Unicom insisted on taking the sincerest attitude, the most open-minded mindset and the most practical actions to further combine strength with its partners, consolidate consensus, deepen cooperation and achieve mutual success, and make new and greater contributions in the new journey of China's modernisation.

• The Company strengthened the construction of cooperation management system, improved the classification and management of cooperation, formulated the "Administrative Measures for Strategic Cooperation of China Unicom", promoted the upgrading of strategic cooperation with Tencent, JD.com, Alibaba, Baidu and other enterprises, and built the Company's core competitiveness and sustainable development in a more standardised, orderly and effective manner.

• Held in Beijing, the 2022 China Unicom Global Partnership Conference with the theme of "Digital and Intelligent Connectivity for All" attracted hundreds of operators and partners from various industries around the world to participate in the conference and explore the trend of industrial reform.

2022 China Unicom Partnership Conference

Working Together with Partners

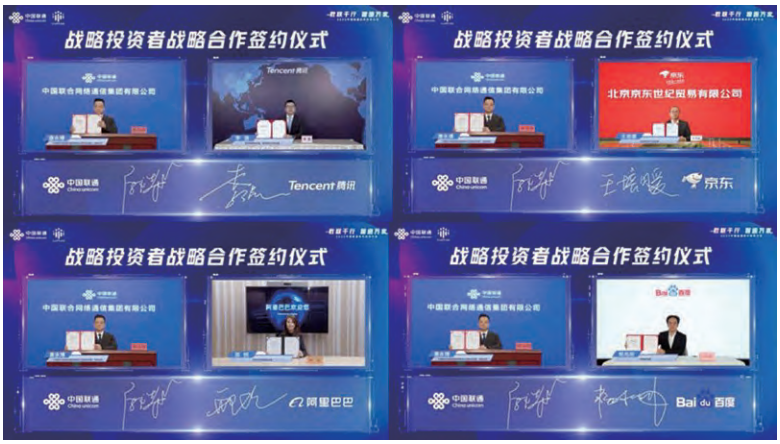
China Unicom has carried out extensive cooperation with industrial chain partners to promote the rapid and high-quality development of the industry, achieve upstream and downstream coordination in the supply chain, and build a new ecosystem of "cooperation, sharing, win-win, synergy and green" Internet-oriented operation to facilitate the stable and sustainable development of the industry chain.

Joining hands with strategic investors

In 2022, China Unicom started a new round of strategic cooperation renewal with strategic investors to deepen cooperation in an all-round way, jointly contribute to the construction of Cyber Superpower, Digital China and Smart Society, jointly cultivate new advantages of innovation and development, and together win the new future of digital economy.

• The Company renewed strategic cooperation agreements with strategic investors such as Tencent, Alibaba, Baidu and JD.com to lay a solid foundation for further cooperation in the future and help create a new strategic cooperation ecosystem for win-win cooperation.

• The Unicom Cloud series products launched in cooperation with strategic investors achieved large-scale development and realised a win-win development paradigm since its launch.



Signing ceremony for cooperation with strategic investors

Cooperating with equipment suppliers

China Unicom improved the supplier management system and revised the "China Unicom Supplier Management Measures" to appropriately select, manage and guide suppliers to improve the resilience and security level of the supply chain.

• The Company relied on the whole-process data analysis capabilities of the supply chain platform to improve resource utilisation efficiency. The e-commerce platform has 84,000 registered vendors and 13,000 vendors were newly registered during 2022.

• The Company activated the intelligent supply chain open platform, conducted risk identification and analysis through the entire process of supply chain, effectively realised automatic risk identification, early warning and control, advocated honesty and trustworthiness, provided convenient services for suppliers, and settled payments as soon as possible.

• The Company developed 235 digital risk control models embedded in the supply chain platform to intercept illegal operations and effectively prevent illegal operations such as blacklisted supplier transactions and bid-rigging.

• The Company insisted on fair trading. By widely adopting the product technology qualification system and unifying supplier entry barrier, it let small-scale suppliers participate in procurement activities in a fair manner.

Region	Eastern China	Northern China	Central China	Southern China	Southwest China	Northwest China	Northeast China
Number of suppliers	28,722	11,234	10,807	11,141	6,704	5,458	9,705

Cooperating with terminal suppliers

China Unicom vigorously promoted actions such as "5G-led Development" and "Broadband and Smart Home Development", built a new terminal ecosystem with China Unicom characteristics, expanded the operational boundaries, enriched product categories, and strengthened the integrated operation of terminals and channels. The Company has cooperated with a total of 1,164 suppliers to achieve common development.

◉ Establishing strategic sharing mechanism and platform

- 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.
- Through open cooperation, the Company integrated upstream and downstream resources in the industrial chain, promoted the new integration of business, channels, terminal and finance, built a ubiquitous intelligent alliance cloud platform, and centralised resource allocation, so as to promote the innovation and prosperity of the entire industrial chain.

◉ Strengthening corporate responsibility and image requirements

- In order to regulate external cooperation and communication, build fair, reciprocal and mutually beneficial cooperations between the Company and suppliers and partners, the Company has established a "blacklist" system to regulate the cooperation behaviour of its partners, govern the behaviour of its employees and partners, prevent partners from seeking illegal benefits through illegal means, and actively guide terminal suppliers to fulfil their responsibilities.
- The Company actively communicated with terminal suppliers who have negative news, and set up a special team to quickly handle customer complaints, information verification, customer comfort and other work, so as to protect the rights and interests of subscribers and effectively address public opinion risks.

◉ Facilitating the development of terminal industry with multiple measures

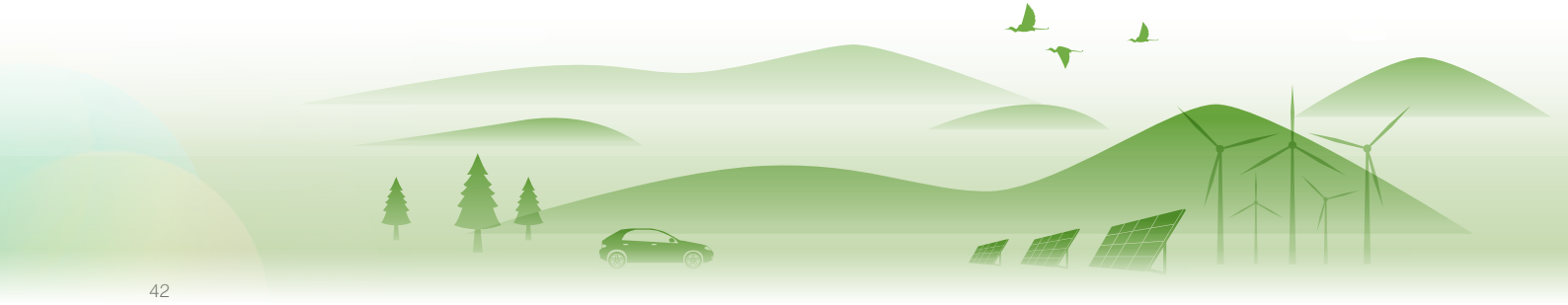
- The Company implemented the "Special Action for Scientific Research and Innovation and Optimisation of Digital Talent Structure". In terms of system and mechanism, the Company has basically formed its scientific and technological innovation strengths in three professional sectors, namely terminal intelligent supply chain research and development, terminal self-development and smart cards. In terms of independent research and development, it has launched 12 pan-intelligent products in 5 categories. In terms of terminal and network coordinated development, it promoted 220 5G mobile phones to support VoNR and 245 hardware to support NR900M.

◉ Continuous promoting pan-intelligent terminal cooperation

- Focusing on scenarios such as digital villages, smart communities, pandemic prevention and control, and caring for the elderly and children, the Company strengthened its cooperation with the TOP brands in the industry and continued to enrich terminal categories.

◉ To be the leader in the field of eSIM applications

- The Company maintained its innovation advantages in eSIM applications, continued to expand the application of wearable and IoT related eSIM products, and took the lead in launching 5G + eSIM consumer products and services in the industry to provide more subscribers with smart experience, which contributed to a 50% increase in the number of eSIM users.



Cooperating with channel partners

China Unicom actively worked with a large number of channel partners, continued to innovate sales channels and methods, encouraged channel partners to fulfill social responsibilities, and provided customers with comprehensive quality services to achieve mutual benefit and win-win situations. In 2022, the number of China Unicom's cooperative channel partners reached 200,000.

Boosting channel productivity through digitalisation

China Unicom empowered the transformation and development of channel partners through digital transformation.

• The Company continued to build a customer-centric "platform-based, digitalised, intelligent and ecological" OMO new channel marketing service system, and strengthened channel touchpoints for targeted markets such as communities, villages, teenagers and small and medium-sized enterprises, so that services can be accessible and closer to the people's living circle.

Smooth sales channels with Big Data

China Unicom joined hands with channel partners to create online and offline borderless sales scenarios.

• Integrating the entire process of broadband e-commerce. The Company has fully established the online minimalist order acquisition, double-line quick-response acceptance capabilities, and broadband online and offline integrated marketing model with smart home delivery, and operated the front and back ends separately from business operations.

• Establishing integrated number marketing capabilities. The Company integrated the omni-channel number resources to form a full number resource pool and connected the online and offline number registration process.

• Fully empowering offline channels with online digital marketing capabilities. Big Data capabilities, precise customer attraction capabilities, intelligent recommendation, smart dashboard, live broadcast and other digital means were fully applied in offline channels.

Promoting delivery and conversion through network-based transformation

China Unicom continued to promote the empowerment of its partners and improve the empowerment of channels and their marketing activities.

• The Company standardised the management of online channels and the organisation process of online marketing activities to improve the circulation efficiency.

• The Company continued to improve the capability of the unified marketing platform, gave full play to the advantages of centralised operation, empowered branches and partners, and provided subscribers with high-quality delivery services.

Shouldering social responsibility with commitment

• China Unicom actively promoted channel partners to fulfil their social responsibilities, standardised service standards through training and other means, and reached a consensus on sustainable development to help partners achieve high-quality development.

• The Company cooperated with channel partners to carry out online and offline anti-fraud welfare publicity activities to educate the public, comprehensively preventing illegal and criminal activities such as telecom and online fraud.

• Relying on the IT Big Data capabilities, the Company analysed and investigated abnormal data to strictly prevent non-compliant operational risks.

Cooperating with MVNOs

China Unicom assisted in deepening the reform of the telecommunications industry, supported the business service innovation of resale enterprises, continued to innovatively empower resale enterprises, and improved the business experience of resale subscribers. Through concerted efforts with resale companies, it provided more considerate, attentive and heart-warming high-quality services for the people.

• The Company took the lead in offering 5G-SA high-speed network service to the resale enterprises, and made available a total of 16 innovative products and network capabilities to expand the innovation space of the resale enterprises, helping to improve the service level of the resale enterprises and the business experience of the resale subscribers.

• The Company strengthened the information security management and control of mobile resale business, and provided management and control means for resale enterprises. In 2022, the complaint rate of harassing call and spam messages was lower than the indicators required by the regulatory authorities.

In 2022, more than **2,600** illegal links were cleaned up with various Internet platforms

At the 2022 Global Development Summit for Mobile Resale Business, China Unicom stated that it would work together with resellers to provide people with more considerate, attentive and heart-warming high-quality services, to empower the digital transformation of various industries, and promote China to become the world's largest and most active resale business market.

Mobile Resale Business Summit 2022

Precise Development through Capital Cooperation

Innovation is the primary driving force for development. China Unicom extensively cooperated with various high-tech enterprises to empower all industries with digitalization, injecting new impetus into technological innovation, and promoting the coordinated development of the industry.

Strategic investment-driven cooperation

China Unicom actively carried out multi-dimensional cooperation in capital, products and projects with strategic partners such as strategic investors, central state-owned enterprises providing digital services and leading enterprises in industries. Currently, it has established 7 joint ventures with 10 strategic partners, covering areas such as digital government, ecological and environmental protection, education, culture and tourism, industrial Internet, radio and media, population Big Data and network security. Through unremitting efforts, the joint venture companies' "specialised, niche, special and novel" capabilities and product supply capabilities have been significantly improved. The market feedback of joint ventures' key self-developed products was good, and at the same time, they have achieved positive and effective synergistic development.

Relying on Unicom Innovation Investment Company Limited, the Company actively promoted the establishment of a new joint venture with Tencent. Based on independent research and development, the joint venture will form complete CDN/MEC platform capability, operation capability and product innovation capability to provide a new generation of CDN and edge computing services for high-definition video industry and artificial intelligence field. Through this cooperation, subscribers of both China Unicom and Tencent can greatly reduce the number of network routing, improve the content download speed, shorten the file transmission time, and further optimise the subscribers' experience of network surfing.

Capital investment-driven cooperation

Adhering to the principle of "diversified, specialised and market-oriented", China Unicom continued to build an investment platform of "direct investment + fund + incubation". Focusing on its strategy and five main responsibilities and main businesses and with the goal of consolidating, supplementing, strengthening and shaping the industrial chain, the Company actively promoted the market-oriented reform and capital operation of professional and innovative subsidiaries in the fields of Internet of Vehicles and communication engineering design, and built a group of "specialised, niche, special and novel" enterprises with innovation capabilities and competitive strength, and "made up for shortcomings and built long-term advantages" through capital.

3 BUILD NEW VITALITY

AND CREATE A NEW LANDSCAPE OF MODERN GOVERNANCE

Serving as the "Pioneer" to Deepen the Reform of State-owned Enterprises
Building a "New Highland" for Innovative Talents
Building a "Booster" for People's Livelihood
Striving to be a "Practitioner" of Ecological Civilisation Construction

Promoting the modernisation of the national governance system and governance capabilities is an inevitable requirement for improving and developing the socialist system with Chinese characteristics. China Unicom consistently adhered to system construction, optimised governance efficiency, promoted smart governance and increased the efficiency of livelihood services. It encouraged joint efforts to create a better life, planned development at the height of harmonious coexistence between human and nature, and strived to transform modern governance from a grand blueprint to a better reality.

Measures adopted in 2022

- The targeted assistance work has been rated as the highest level of "good" by the supervising authorities for four consecutive years.
- The Company promoted the implementation of talent-based corporate development, actively adjusted the talent structure for scientific and technological innovation, continued to build a four-level talent pool, and regularly carried out rank and salary promotions.
- The Company carried out the construction of "Digital Village" in more than 3,500 districts and counties, serving more than 230,000 administrative villages in total.
- The Company further promoted the "3+5+1+1" action plan, established three major carbon management systems, focused on five major green development directions, deepened the expansion of co-build co-share, empowered various industries and digital applications, and helped them save energy and reduce carbon emissions.

Actions to be taken in 2023

- The Company will continue to deepen reforms based on strategic deployments, consolidate the results of these reforms, accelerate the improvement of the comprehensive effectiveness of its reforms, and promote more efficient, higher quality and more competitive development.
- For low-ranking (levels 1-7) employees, the Group will set up special resources to implement the "promotion" plan for raising salary.
- The Company will continue to deepen the work paradigm of large-scale support, and provide greater assistance to consolidate and expand the achievements of poverty alleviation in targeted areas, effectively connecting with rural revitalisation.
- In infrastructure construction, the Company will strictly implements the environmental protection regulations on dust prevention and noise control issued by the national and local industry authorities.

Serving as the “Pioneer” to Deepen the Reform of State-owned Enterprises

China Unicom always adheres to integrity management and compliance while further implementing the three-year action plan for state-owned enterprise reform. China Unicom adopts systematic thinking and strives to synergistically integrate the three-year action plan for state-owned enterprise reform and the innovation and reform tasks determined by the “1 + 9 + 3” strategic plan, aiming to promote high-quality corporate development.

Carrying Forward the Spirit of Integrity and Honesty

China Unicom unswervingly pushed forward the anti-corruption campaign, and promoted a culture of integrity where employees dare not, cannot, and do not want to engage in corrupt activities. With unwavering determination and perseverance, the Company persisted in correcting the “four styles” to create a new atmosphere.

Continuous Improvement of the Anti-corruption System

In 2022, the Company further improved the system and revised the relevant system and measures based on actual situation.

- **Strengthening top-level supervision:** The Company formulated and issued the Work Measures of China Unicom to Strengthen the Supervision of “Top Leaders” and Leading Teams, as well as the task list which further clarified the responsibilities and implementation measures of anti-corruption supervision.
- **Practising integrity construction**: The Company formulated the “Work Plan for China Unicom to Strengthen the Construction of Integrity Culture” and the “Interim Provisions of China Unicom on Discipline Inspection and Supervision Suggestions”, which refined the objectives and implementation plans, and improved the efficiency in promoting reform with cases.
- **Strengthening external risk control**: The Company revised the “Notice on the Correct Application of China Unicom’s Measures for the Administration of Blacklist of Suppliers (Revised)”, which strengthened the hierarchical and dynamic management of suppliers blacklist. It also prevented partners from seeking illegal benefits through unlawful means.

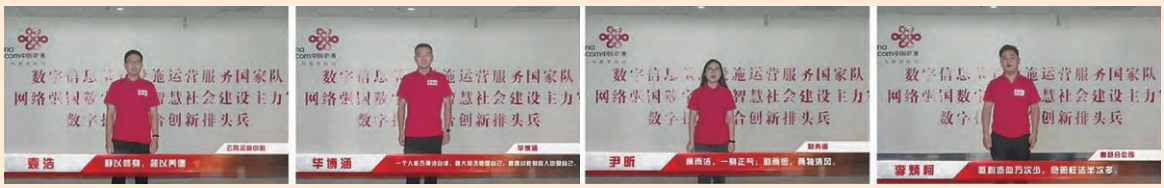
Continuous enrichment of anti-corruption measures

- **Promoted risk classification:** The Company organised 48 secondary units to systematically identify integrity risk points, thoroughly investigated the causes from all aspects, and formulated targeted prevention and control and rectification measures. The completion rate of major investigation and rectification measures for integrity risk prevention and control reached 99.18%.
- Deepened anti-corruption education: The Company carried out 5 large-scale anti-corruption warning education throughout the system, covering more than 1,256,000 person-time. A total of 35,000 young cadres received training in various disciplines, and more than 23,000 leaders were interviewed throughout system.
- Innovated anti-corruption tools: The Company improved supervision efficiency through informatisation. By using China Unicom’s smart discipline inspection and supervision platform, the Company will continue to explore and innovate the coordination and connection of supervision, and promote the vertical and horizontal coordination of supervision forces.

Increasing achievements in anti-corruption efforts

In 2022, China Unicom’s corporate integrity ecosystem continued to improve. The number of complaints and visits across the system decreased by 22.6% year-on-year in 2022, following year-on-year decreases for four consecutive years from 2018 to 2021. The strategic results of anti-corruption efforts continued to consolidate and expand. For more information on the number and outcomes of corruption-related litigation cases, please visit the website of the Central Commission for Discipline Inspection and the National Supervisory Commission.

1,438
anti-corruption warning education sessions



New employee representatives of China Unicom Shandong filmed a micro video themed “Youth Advocating Integrity, Integrity Protecting Youth”

Commitment in Compliant and Lawful Operations

China Unicom is committed to building a compliant, resilient and safe operating system. By continuously deepening corporate governance, strengthening legal risk prevention and control, and improving the protection mechanism for major risk prevention and control, China Unicom has effectively promoted the implementation of the Company's new strategic plan and achieved high-quality development.

Enterprise construction led by rule of law

China Unicom adhered to the rule of law to lead enterprise construction. The Company achieved corporate governance in accordance with the law by formulating rules and regulations for compliance operation, building a compliance operation system and improving the compliance review process.

Improving compliance management system

The Company improved its special compliance management system and continuously strengthened the foundation of the compliance management system.

- The Company issued the "Implementation Measures for the Compliance Management of Professional Lines of China Unicom" to further consolidate the main responsibility of compliance management of professional lines and improve the compliance management of professional lines.
- The Company issued the "China Unicom Code of Conduct for Integrity and Compliance" to strengthen compliance training of professional lines and cultivate a culture of integrity and compliance that "complies with regulations and acts with responsibility", 228,000 employees signed online compliance commitments to promote compliance culture.
- The Company iteratively updated the "China Unicom Professional Line Compliance Manual" to comprehensively transform the legal regulations and regulatory requirements closely related to the Company's operation and management into compliance at all levels of each professional.

Building a compliance operation system

China Unicom organised and carried out the "Year of Strengthening Compliance Management". The Company completed 22 tasks in 7 major aspects and continuously improved the compliance management system and level.

- The Company conducted in-depth comprehensive compliance risk investigation at all levels and all fields. It formulated targeted rectification measures for the identified risks and violations of laws and regulations, and strictly and carefully implemented the measures, thus continuously enhancing the ability of compliance risk prevention and control.
- The Company focused on compliance risk management in the areas of trading business, procurement bidding and tendering, engineering construction, and scientific research funding, promoting the rectification of violations in key areas and establishing of a long-term mechanism.
- The Company established a compliance risk database in key areas. It compiled a list of compliance responsibilities for key positions, provided important guidelines for establishing a long-term mechanism for compliance risk prevention and control, and promoted the implementation of a compliance responsibility system for all employees.
- The Company regularly conducted education on compliance operation and management for employees. It carried out a number of legal compliance knowledge contests, and produced and published legal articles and videos through the Company's legal knowledge platform, with nearly 200,000 people learning legal compliance knowledge.

Improving the Compliance Review Process

The Company conducted compliance reviews on the operational and management activities such as formulation of rules and regulations, decision-making on major issues and signing of contracts, to ensure legal and compliant operations.

- In terms of process setting, the compliance review process was embedded in the operational and management process to ensure that compliance review is a pre-requisite procedure for relevant operational and management activities.
- In terms of review, the Company evaluated whether the relevant operation and management activities and their carriers were in compliance with the requirements of national laws and regulations, regulatory requirements, industry standards, international treaties, rules, the Articles of Association, rules and regulations, etc.

Over **300,000** person-times in law-abiding and compliance learning

Published **2,150** legal articles and videos

Reading volume of legal platform exceeded **6.25** million

Improving risk resistance ability

China Unicom attached great importance to enterprise resilience in the face of major risks. Starting with the three aspects of "internal control, information disclosure and risk management", China Unicom has built a resilient and risk-resistant enterprise system.

Strengthening internal control and building a safety fortress

• China Unicom continued to deepen the construction of internal control system by adding a total of 9 control processes, 24 risk points and 27 control measures in 2022, removing 12 control processes, 28 risk points and 35 control measures, and revising 4 control processes, 14 risk points and 151 control measures, as well as updating 50 institutional basis.

The Company adhered to the internal control objectives and risk-oriented approach. It promoted the continuous improvement and effective operation of the internal control system by continuously deepening the construction of internal control system, strengthening the management and control of professional lines, strengthening supervision and evaluation, and strengthening accountability and assessment and restraint.

• The Company continued to strengthen its legal prevention and control capabilities, consolidate the basic management system of litigation, focus on risk investigation and resolution, strengthen the supervision of major cases, and create a stable and solid business environment, laying a solid foundation for long-term sustainable development.

Regular information disclosure

China Unicom regularly disclosed information to build an effective and reliable supervision system to ensure the compliance operation of the Company.

• The Company regularly conducted self-assessment of internal control and internal audit supervision to ensure that the design of internal controls was reasonable and the execution was effective.

Continuous risk management, timely analysed and summarised

• The Company adhered to the goal-oriented approach. It focused on prevention and combined prevention and control. It strengthened the management and control of the source of major risks, regularly carried out annual major risk assessments across the Group, formulated targeted prevention and control measures, and notified them across the Group.

• The Company determined the quantitative monitoring indicators for major risks. It carried out regular tracking and monitoring, analysed the changes in assessment indicators and changes in risks, analysed and summarised the implementation of prevention and control measures in a timely manner, and effectively ensured the effectiveness of risk management and control.

• The Company formulated the "Working Rules for the Reporting of Operational Risk Events of China Unicom" and the risk management system of relevant professional lines. It clarified the responsibilities and authorities of risk event management and standardised the procedures of event handling, reporting and disclosure.

• With good credit records, the Company has established good cooperative relations with state-owned banks, some joint-stock commercial banks and policy banks, etc. All due debts have been repaid with the principal and interest on time, and there is no debt default. The overall debt risk is controllable.

Continuing to Drive Enterprise Reform

China Unicom deeply implemented the three-year action plan for state-owned enterprise reform, completed 130 reform tasks in the three-year action plan for reform with high quality, and achieved a series of remarkable and milestone results in the reform.

Strengthening the board of directors

China Unicom has made the construction of the Board a priority to advance the corporate governance capability and governance system to a new level.

• At the group company level, the Company promoted the board diversity. The Company conducted special surveys on independent directors to effectively play their role in supervision and management.

• At the subsidiary level, the subsidiaries have all established a board of directors, if appropriate, with necessary enhancements. The Company focused on improving the governance system of subsidiaries, established the "1 + N" subsidiary governance system, established a differentiated list of powers and duties of the board of directors with one policy for each subsidiary, and promoted subsidiaries to be the market players with sound governance, robust mechanism and vitality.

Improving the market-oriented mechanisms

China Unicom comprehensively improved the quality of tenure-based and contract-based appointment and focused on improving removal conditions, tenure assessment management and differentiated assessment of deputy positions. It achieved 100% full coverage of managers at all levels of operating units.

Branches and subsidiaries established a medium-and long-term incentive system. 87% of the subsidiaries implemented medium-and long-term incentive policies and actively explored more flexible incentive methods such as employee stock ownership and excess profit sharing. They effectively explored and implemented scientific and technological innovation incentives, and carried out joint investment pilot projects in the field of innovation.

The Company deepened the reform of stimulating the vitality of front-line units, with 27,000 "small CEOs" and 210,000 employees joined the grassroots responsibility units. The Company adhered to the guidance of "grid + Big Data + iron foot", initially formed a customer-oriented and digital-empowered front-line grid operation system which significantly improved the front-line operation efficiency.

Deepening reform

• The Company was granted as a "Double Hundred Enterprises" and a "Science and Technology Reform Demonstration Enterprises", demonstrating its efforts to explore and promote market-oriented reform and build the technological innovation capabilities.

• The Company steadily promoted the mixed ownership reform of its subsidiaries. China Information Technology Designing & Consulting Institute Co., Ltd. introduced investors with strong strategic synergy and formulated overall plan for market-oriented operation mechanism reform of mixed ownership reform enterprises and employee equity incentives implementation plan. It focused on promoting the transformation of operation mechanism of mixed ownership reform enterprises.

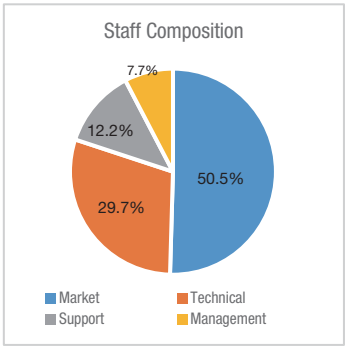
• The Company completed the joint-stock reform of Smart Connection Technology Company that meets the conditions for listing. The Company carried out comprehensive evaluation and started the spin-off and listing process in a steady manner.

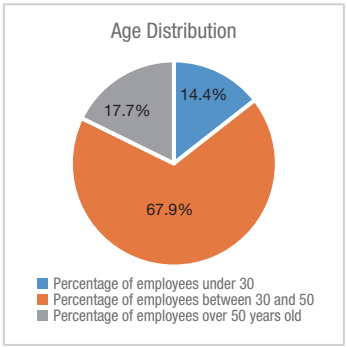
Building a "New Highland" for Innovative Talents Aggregation

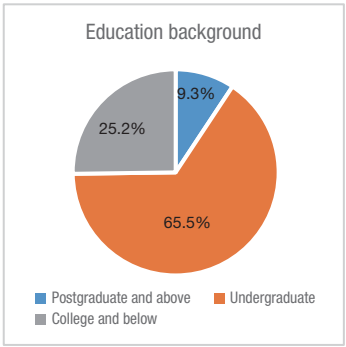
China Unicom attached great importance to talent cultivation, promoted talent development in depth, accelerated the establishment of competitive advantages in talent resources, built a high-level talent training platform, cultivated a number of leading and high-level innovative talent teams, and continuously built new momentum and new advantages for development. At the same time, the Company fully respected and protected the basic rights and interests of each employee, and committed itself to creating a career platform for employees to demonstrate their talents and grow together with the firm.

Promoting Talent Structure Adjustment

China Unicom actively adjusted the talent structure for scientific and technological innovation, and spared no effort to attract and cultivate talents, so as to promote the healthy development of the talent structure for strategic emerging industries and stimulate the vitality of talents.







Total number of employees	Employees in Mainland China	Employees in Hong Kong	Employees overseas	Percentage of scientific and technological talents	Gender proportion (male/female)	Proportion of ethnic minority employees	Temporary Staff in Mainland China (person)
244,658	243,586	723	349	30%	1.63: 1	6.76%	10,345

Improving the introduction mechanism

China Unicom fully grasped the new requirements of the Company's new positioning, new strategies and new business deployments for talent recruitment, adhered to the principle of matching talent recruitment with the Company's development needs and job capabilities, established a sound talent introduction mechanism, and vigorously implemented the talent project.

In 2022, China Unicom recruited a total of approximately 13,000 people through campus recruitment and social recruitment, which was more than "one-thousandth" of the number of new urban jobs in the country in 2022. The scale of campus recruitment increased by 25% year-on-year, realising the dual purposes of talent recruitment and stabilising employment, and fully demonstrating the political, social and economic responsibilities of the Company.

13,000
talents recruited throughout the year

Percentage of number of new urban jobs in the country in 2022
More than "one-thousandth"

Optimising talent team

The "418" talent project was fully implemented. The total number of innovative talents in the special zone reached more than 9,000, and nearly 50 industry experts were recruited in the past two years.

The Company continued to promote the construction of dual channels for employee development, and built a four-level professional talent pool of 20,000, including 1,024 leading and expert talents, 6,377 backbone talents and 12,370 new talents.

Protecting Basic Rights and Interests of Employees

The Company adhered to the employee-friendly and people-oriented principle, fully considered the diversity and equal opportunities of talents, respected labour, knowledge, talents and innovation, creating an inclusive, diversified and happy working environment for employees.

Adhering to fair employment

• The Company strictly implemented the relevant provisions of the Labour Contract Law, signed labour contracts with 100% of employees, and implemented dismissal policies in accordance with relevant national requirements.

• The Company has formulated the Human Resources Risk Prevention and Control Manual to improve the recruitment supervision and inspection mechanism, clarify the list of negative behaviours and policy bottom lines, and prohibit discrimination policies on ethnicity and gender during the recruitment and promotion process and avoid child and forced labour.

• The Company attached great importance to protecting human rights and respecting personal privacy, complied with relevant laws and regulations relating to preventing child and forced labour, with no cases in relation to use of child labour, forced labour or abuse of employees.

Protecting legal rights

• The Company implemented national regulations on working hours management, implemented a paid leave system to safeguard employees' right to leave; and ensured 100% retention of job opportunities for female employees after maternity leave to protect their legitimate rights and interests.

• The Company implemented a paid leave system for employees whose children were taking the senior high school or college entrance examination, actively responded to and promoted the implementation of parental leave and single-child care leave, and demonstrated humanistic care for employees.

• The Company has established 13,700 labour unions at all levels, with 100% employee participation in labour union.

Optimising compensation and benefits

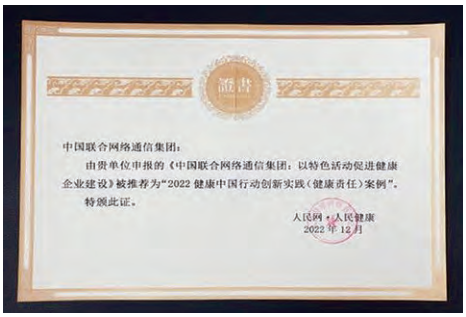
The Company is committed to optimising labour cost allocation rules, implementing a fair and transparent salary compensation mechanism, improving the welfare system, and building a fair and harmonious compensation relationship. Regarding the performance appraisal and remuneration of the management, total salary management and other important daily matters of the Company, after full discussion by the Remuneration and Appraisal Committee, relevant opinions and resolutions were submitted to the Board of Directors to provide strong support for the scientific decision-making of the Board of Directors. Among them, the remuneration level of senior management was determined through performance appraisal according to performance appraisal measures.

• The Company regularly carried out employee rank and salary promotion, with a rank promotion rate of 18% and a salary promotion rate of 39% in 2022.

• The Company flexibly carried out mid-term and long-term incentives, and completed the grant of 800,000,000 second-phase Restricted Shares of A share company in total for 7,700 persons.

• All units followed the relevant national and corporate policies and regulations to establish enterprise annuity system for employees, and paid social insurance premiums and housing provident funds in full and on time.

• The Company carried out occupational health care and established a "three-in-one" assistance system of critical illness insurance, mutual aid fund and supplementary medical care. 11 health enterprise construction cases of China Unicom were selected as distinctive health cases by labour unions at different levels of the China Association of Communication Enterprises, and won the award of "2022 Healthy China Action Innovation Practice (Health Responsibility) Case" granted by People.cn.



2022 Healthy China Action Innovation Practice (Health Responsibility) Case" awarded by People.cn

Facilitating Communication and Growth of Employees

China Unicom continued to promote the construction of talent teams, encouraged employees to provide advice and suggestions, strengthened employee training, continued to improve the talent and value of the workforce, and increased the care for employees, which significantly enhanced the happiness and pride of employees.

Improving democratic management

China Unicom established a robust democratic management system based on the staff representative assembly, coordinated and promoted the three-in-one democratic corporate management comprising "staff representative assembly, open corporate affairs, and employees' advice and suggestions". It guaranteed the right to know, participate, express, and supervise of employees at all levels, and encouraged employees to contribute their wisdom to the development of the Company.

• The Company kept smooth channels for reasonable suggestions, established a quick response mechanism for employees' demands and feedback through various reasonable suggestions activities such as online "General Manager Online", to effectively protect the legitimate rights and interests of employees. Throughout the year, the Company carried out more than 300 "General Manager Online" meetings, collected more than 6,000 reasonable suggestions, and reached a problem-solving rate of over 90%.

• Throughout the year, the Company held about 700 staff representative assemblies at all levels. Over 300 items of various matters were discussed at the provincial company level, over 3,000 items were discussed at subsidiaries and municipal companies, and there were nearly 10,000 items of various proposals.

• 335,000 employees participated in the employee satisfaction survey throughout the year. The Company continuously improve employee satisfaction in response to employees' demands.

• The Company carried out in-depth class activities with the theme of "Know Your Account in Mind". The Company established a joint discussion and management mechanism to stimulate the vitality of front-line units. During the year, the Company organised more than 50,000 "Know Your Account in Mind" themed class activities, which greatly stimulated the endogenous motivation of front-line employees and effectively protected employees' right to know, participate and supervise.

37 employee complaints were handled through labour dispute mediation organisations in 2022

Problem solving rate
97.5%

Staff representative assembly of China Unicom Zhejiang Branch

Staff representative assembly of China Unicom's Software Research Institute

Supporting capacity development

Strengthening the construction of training system. The Company issued the "China Unicom 2022 Key Training Plan of the Group" to form a three-category training plan for management, profession and Party building based on the principle of full coverage of key groups.

Optimising the professional capability standard system. According to the professional capability certification standards, the Company completed the update and iteration of 8 capability standards. It conducted several professional capability certification examinations, with more than 200,000 participants and 92,536 professional talents passing the certification.

Training participants	Training Content
Management personnel	Continuing to carry out the education and training on Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, with a total of 4652 management personnel participating in the rotation training.
Outstanding young cadres	The Company held the 2022 Youth Management Talent Demonstration Class (Class I and Class II) and a total of 89 outstanding young cadres participated in the training.
High-level talents	For high-level talents in the key technology field, the Company carried out school-enterprise joint training. In 2022, a total of 32 people were selected and recruited for master doctoral degrees in engineering at Beijing University of Posts and Telecommunications, University of Chinese Academy of Sciences, Nanjing University and Sun Yat-sen University.
Professional talents	Improving the digital capabilities of key groups in strategic business key positions, and continued to implement digital empowerment projects; Focusing on the five main responsibilities and main businesses, the Company carried out featured training programmes in 5G, Big Data, cloud computing, AI and blockchain.
Front-line employees	The Company held more than 74,000 training sessions for digital transformation, with a total of more than 5,010,000 participants; More than 70,000 sessions and 2,440,000 person-times of training were conducted for employees in business, operation, hotline and installation and maintenance.

No. of senior management received training (person-times)	9,274	Average training time of female employees (hour/person)	118
No. of middle management received training (person-times)	214,526	Average training time of senior management (hour/person)	183
No. of general employees received training (thousand person-times)	5,012.2	Average training time of middle management (hour/person)	141
Average training time (hour/person)	118	Average training time of general employees (hour/person)	116
Training rate of male employees (%)	98.31	Training rate of senior management (%)	100
Average training time of male employees (hour/person)	118	Training rate of middle management (%)	100
Training rate of female employees (%)	98.31	Training rate of general employees (%)	98.31

Building a skills training platform

In 2022, the labour and skills competition of China Unicom comprehensively focused on the "1 + 9 + 3" strategic planning system. It anchored the five main channels, built a multi-level, multi-professional and high-coverage group-level labour and skills competition system, and united and mobilised employees to improve their skills and make achievements in the high-quality development of the Company.

• Adhering to innovation-driven development, innovation-related competitions accounted for more than 30% of the total competition, with a total of 180,000 employees participating, generating more than 30,000 innovative solutions.

• Through the competition, the Company improved quality and efficiency, promoted transformation and development, and saved operating costs of RMB110 million.

• The Company signed more than 15,000 projects from government and enterprise innovation solutions and self-developed product promotion labour competitions, 101 self-developed products recorded revenue of more than RMB10 million. Total contract value exceeded RMB10 billion, which was more than the sum of the past three years.

The whole Group held **1,410** various competitions

Covering **1.21** million employee times

Creating a Happy Life for Employees

China Unicom attached great importance to the physical and mental health of employees, strived to create an inclusive, diversified and happy workplace environment with work-life balance, and actively organised various cultural and sports activities for employees, helped employees in difficulties, so as to help them live a healthy life and work happily.

Safeguarding physical and mental health

• For three consecutive years, the Company organised the "Mental Health Month" and offer EAP to the front line. The total number of visits of the "Mental Health Month" activities reached over 1.1 million person-times, with more than 77,000 participants in knowledge competitions, and more than 32,000 participants in mental health examinations.

• The Company set up a total of 140 "psychological station" across the country to carry out rich team counselling, group salons, psychological counselling, pressure reduction massage and other activities.

Supporting pandemic prevention and control

In the face of frequent outbreaks across the country and the severe and complex pandemic situation, the China Unicom Group's labour union allocated special funds to areas severely affected by the pandemic to help prevent and control the pandemic.

Shanghai Branch and Jilin Branch made every effort to protect the physical and mental health of employees They provided pandemic prevention materials, set up online medical care and psychological counselling hotlines, and offered pandemic prevention psychology classes, etc., to help employees fight against the pandemic with a positive attitude. The labour union of China Unicom Shandong Branch launched a psychological care assistance hotline for employees to help them solve difficulties in work and life. China Unicom Hunan Branch allocated RMB1,443,000 as anti-pandemic special funds to assist front-line labour unions in fighting against COVID-19. The labour union of China Unicom Shaanxi Branch timely provided material support and care, and set up 10 "Employee Care Stations" equipped with abundant instant food and frequently used medicines.

Carrying out cultural and sports activities

Labour unions at all levels carried out online and offline cultural and sports activities, promoted the construction of dance rooms, gyms, yoga rooms and other places of activity, so as to promote national fitness and enrich the cultural life of employees after work.

Fun Sports Gala of China Unicom Yunnan Branch

Sports Gala of China Unicom Guizhou Branch

Protecting the rights and interests of female employees

• The Company actively provided special health examinations for female employees, promoted the screening of "two cancers", and provided exclusive care and health guidance services for female employees. The labour unions at all levels generally carried out the "March 8 Festival" activities to enhance the happiness and sense of achievement of female employees.

• The labour unions at all levels have been providing childcare services for employees for many years They actively implemented maternity policies and constructed breastfeeding rooms to solve the worries of female employees.

Helping employees in difficulties

The Company established files for employees in difficulties, with a separate file and policy for each employee. The Company improved the files and administrative measures for filing of employees in difficulties and support and assistance, and carried out and assistance work for employees in difficulties according to the files, so as to help them overcome their difficulties. Care and condolences were given to flood, drought and other disaster-stricken units in a timely manner.

In 2022,
labour unions at all levels
organised nearly **6,000**
recreational and sports activities

RMB **81** million spent on
supporting employees in difficulties

RMB **42** million spent as
condolence fund

Building a "Booster" for People's Livelihood

The improvement of people's livelihood is crucial to the overall situation of China's modern development. China Unicom regarded improving the well-being of the people and promoting their all-round development as the starting point and goal of digital development. The Company continuously enriched the connotation of its communication products and services, actively conveyed the warmth of public welfare, promoted employment, safeguarded the legitimate rights and interests of employees, and continuously enhanced the sense of gain, happiness and security of the people.

Providing Warm and Intelligent Services

China Unicom adhered to the people-oriented development goal, focused on the "1 + 9 + 3" strategic planning system, and deeply implemented the action plan for high-quality services to promote high-quality development with high-quality services. Through multi-angle and three-dimensional publicity, the Company told the service stories of China Unicom, improved the brand reputation of the Company, consolidated the foundation of service, and shaped the reputation of high-quality service.

Building a Quality Service System

China Unicom released the "White Paper on High-quality Services" on 27 June 2022, and actively built an integrated dual circulation operation synergy system to continue creating high-quality services that satisfy existing users and attract new customers.

• Strengthening the "1+4+31" integrated dual circulation operation synergy system. The Company built a 1+4+31 collaborative operation mechanism. Its promoted the coordination among four regional call centres, one upgrade investment centre and 31 provinces. The regional call centres and the centralised provinces deeply collaborated in terms of knowledge operation, work order operation, training, service quality, etc. It systematically connected to support provincial branches, coordinated communication, efficiently promoted the implementation of related work, and did a good job in service support of provincial branches.

• During the Beijing Winter Olympics and Paralympic Winter Games (hereinafter referred to as the Winter Olympics), a service team for the Winter Olympics was set up to provide communication business consultation, handling and problem-solving for customers involved in the Winter Olympics. A total of 12,300 person-times were served.

• Building a closed-loop management process for customer satisfaction. The Company built a contact-based evaluation system for hotline services, and the satisfaction evaluation results were monitored in real time to achieve re-activation of dissatisfied calls. The Company promoted the evaluation of all work order deliveries, and re-activated the outstanding unsatisfactory work orders to improve customer satisfaction.

• Newly added 62 self-service scenarios and 71 direct handling interfaces to enable direct and quick handling of simple business through self-service.

Providing Quality Service Experience

China Unicom organised "100% attention for high satisfaction – I do practical things for the public" special activities, and continuously improved the customer service experience monitoring system and mechanism with specific measures. The Company enhanced self-service capabilities, and provided customers with all-round quality services to improve customer service experience.

• The Company established a customer service experience monitoring system for all customers and all businesses, comprehensively understood customer problems, realised all-round supervision and quick rectification, and achieved a leap in industry status. Customer satisfaction reached 98.4%.

• The Company quickly established a production process that focuses on short-chain solutions. In order to solve various problems encountered by users in the communication travel cards, the customer service hotline, as one of the touch points of customer service, cooperated with professional lines to establish a short-chain processing workflow, and effectively solved the "pain point" problems of subscribers. A total of 3.16 million travel card queries were received.

• Introducing a customer-oriented service supervision mechanism. The Company established a more stringent indicator evaluation system, introduced internal and external service supervision mechanisms from the perspective of customers, realised the supervision of hotline from the perspectives of each channel, with quick rectification to provide customers with high-quality services.

• Self-service hotline service quality inspection. The Company carried out quality inspection of hotline services targeted at identifying errors, failures of solutions and repeated calls in self-service hotline calls. The Company optimised 127 self-service processes in a targeted manner to improve the efficiency of problem solving and enable satisfactory self-service of simple business.

Improving problem solving skills

China Unicom continued to improve its problem-solving ability, provided solutions to address customers' concerns, timely and effectively solved problems for customers, built a responsible corporate image, and established a good business reputation.

• The Company continued to improve the integrated operation capability, established the mechanism of "front-line whistleblowing and department reporting" and coordinated the front and back offices of all professional lines to respond to each customer's problem in a timely manner and improve customer satisfication.

• The Company continued to promote the digital closed-loop management and control, transparent display, and integrated platform carrying of all customer problems. Customer perception improved significantly, and the valid complaint rate by the MIIT reached a new record low. The effectiveness of the service was significantly improved, and the satisfaction rate of customer problem solving increased significantly by 22 percentage points.

• Based on business needs, the Company continuously optimised the perception assessment of product usage, and deeply understood the subscriber experience from five aspects, namely tariff & package content, publicity, handling, notification and use. In 2022, the Company continued to carry out subscriber consultations on product usage, cumulative covering 105 million person-times.

Conducting various service activities

China Unicom actively cooperated with various industries to provide diversified service support and achieved high-quality reputation promotion across the industry.

• Focusing on the unified topic of "Attentive Service of China Unicom for You", the Company combined provincial and group-level publicity with special features, national linkage and all-round publicity to form a systematic and rhythm-based three-dimensional publicity voice. The cumulative publicity volume in China reached 5.14 billion times, and nearly 20,000 reports were released by major media such as Xinhuanet, People.cn and SASAC News, effectively driving the positive improvement of the Company's reputation.

• The Company made every effort to support the publicity and service of the Winter Olympics to polish the corporate brand of supporting the Winter Olympics. In terms of services support, the Company set up a special service support team for the Winter Olympics during the events, strengthened the rapid handling of complaints, and achieved smooth hot line services and efficient resolution of complaints during the Winter Olympics and Paralympic Winter Games. In terms of publicity and organisation, the Company coordinated the promotion of the Winter Olympics to its 400 million customers, completed 238 original works, and achieved a cumulative publicity view of 780 million, fully demonstrating China Unicom's contribution to the Smart Winter Olympics powered by 5G, and enhancing the Company's brand reputation in Winter Olympics service.

Carrying out activities to help the disabled and the elderly

China Unicom continued to increase its humanistic care for people with special needs, providing all-round and caring services for the elderly and disabled people, and helped to create a warm and harmonious society.

In 2022, China Unicom benefited more than 680,000 disabled subscribers, with an accumulated reduction and exemption of communication fees exceeding RMB240 million. The Company benefited more than 5.4 million elderly subscribers, with an accumulated reduction and exemption of communication fees exceeding RMB270 million. The 10010 hotline for customers over 65 years old served a total of 66.8 million times and served more than 18.2 million person-times. China Unicom's business outlets set up 4,969 smart elderly service experience centres, and organised 50,000 elderly-friendly activities, serving 1,011,000 person-times, which was praised by the community.

On May 17, 2022, China Unicom officially upgraded and released the "Silver-age Exclusive" service plan to the society. With warm service, the Company joined hands with elderly customers to cross the "digital divide" and experience smart living, so that they can have more sense of gain, happiness and security in the digital age.

China Unicom's "Silver-age Exclusive" Service Plan

China Unicom Anhui Branch optimised the elderly-friendly service in the outlets, continued to enhance its elderly service training and created a "face-to-face" service model for the elderly. The Company provided exclusive and comfortable services for elderly customers, truly enabling them to enjoy the convenient life brought by the technological progress.

Elderly-friendly services at China Unicom Anhui Branch

In 2022, China Unicom Beijing Branch actively built a demonstration base for the application of technology to help the disabled, in the form of public welfare services for the Beijing Disabled Persons' Federation. This made the management platform of the municipal service demonstration centre for the disabled more intelligent and scientific products more easily accessible. It also carried out the information accessibility construction of Hui Ai Building, and developed and installed, free of charges, the indoor navigation system for the visually impaired group, the fall prevention system for the handicapped and the statistical system for the service flow of the disabled, so as to build a demonstration base for the application of technology to help the disabled in Beijing.

A hearing-impaired person was experiencing the "Ting Yu Ling" AR subtitle glasses

A visually impaired person was experiencing the indoor navigation system for the blind

In 2022, the overall satisfaction rating of the Company by the Ministry of Industry and Information Technology showed an improvement trend throughout the year

Overall satisfaction **81.97** points

up by **0.29** points month-on-month

Among which, network satisfaction increased by **0.87** points year-on-year

with a year-on-year improvement of **0.37** points in service quality

5G-specific satisfaction remained **industry-leading**

Engaging in Public Charity to Benefit the Society

As a compassionate, responsible, and courageous communications enterprise, China Unicom has always insisted on connecting with science and technology in good faith, delivering warmth through practice, and actively participating in the development of social welfare undertakings. The Company has deepened its focus on the fields of concept inheritance, social livelihood, environmental protection, epidemic safety, etc. As always, China Unicom takes practical actions to fulfil national requirements, fulfil social responsibilities, give back to the people's trust, and contribute to the construction of a warm and harmonious society.

RMB **1.045** million external donations in 2022

Building a Youth Volunteer Team

China Unicom always attaches great importance to the inheritance and development of the public welfare concept among the youth. In 2022, China Unicom strengthened its efforts in educating and cultivating young people, actively encouraged them to participate in social welfare undertakings and contribute to the creation of a warm society.

China Unicom continued to vigorously promote the youth volunteer service action. Up to now, there are 943 youth volunteer organisations, 43,237 young volunteers, 6,398 volunteer service activities, and 49,918 person-times of service, including 5,909 in rural revitalisation, 6,805 in poverty alleviation, 17,803 in public welfare and environmental protection, and 19,401 in other volunteer activities. A young volunteer team with enthusiasm, courage, dedication, and goodwill has been successfully built.

Donation project	Donation amount (RMB thousand)
Poverty alleviation investment fund	71
Aid to frontier regions (aid to Tibet, Xinjiang)	43
Other donations (culture, sports, education, medical care, public welfare, environmental protection, etc.)	931
Total	1,045

In 2022, China Unicom Hubei Branch officially launched the "WO Love Volunteer" Special marketing campaign, which actively encouraged youth groups to participate in public welfare activities. The campaign provided "WO Love Volunteer" exclusive tariffs to registered volunteers in the province, provided exclusive and customised 5G video call services for mobile phone subscribers in the province who were registered volunteers, and provided part-time and summer internship activities for college students in various regions who were registered volunteers. Up to date, China Unicom has benefited more than 700 volunteers across the province.

"Tribute to Volunteers – Volunteer Public Welfare Creation Camp" commendation ceremony

Addressing the needs of society for livelihood

China Unicom continued to take improving people's livelihood and well-being as its own responsibility, and continued to provide caring assistance to diverse groups such as the elderly, left-behind children, labourers and young students, spreading the warmth of China Unicom in all aspects and lighting up the hope of the society with the power of goodwill.

- Demonstrating "filial piety", the Company carried out elderly care services through public welfare volunteer activities, and effectively improving the sense of achievement and happiness of the elderly from three aspects: providing services, knowledge education and companionship.
- Being concerned about childcare, the Company protected the growth of left-behind children with the aim of cultivating a healthy and happy physical condition.
- Understanding the "people's minds", the Company showed warmth to the people working hard in all walks of life on the premise of equality, respect and empathy.
- With goodwill and to help the self-development of young people, the Company provide a social platform for college students.

In 2022, China Unicom Hubei Branch actively organised volunteers to carry out free haircuts, free medical consultations, distribution of brochures and other activities for the elderly in the community, and frequently carried out special lectures such as "Anti-fraud Knowledge Classroom" to explain telecom fraud issues. In addition, they also visited the elderly who were empty nesters or living alone through on-site visits to satisfy their needs and provide them with supplies.

Charitable medical consultation

Charitable haircuts

Visiting elderly living alone

In 2022, the "East Hedge Home", a multi-cross-coordinated and integrated moral education platform for left-behind children, built by China Unicom Zhejiang Branch, provided mental health counselling services 854 person-times, and handled 283 outstanding problems in a joint way. The collaborative handling rate of functional departments increased to 98%, and the education conversion rate of problematic children increased to 96%. The abuse rate, illegal crime rate and mental health problem rate all dropped significantly year-on-year.

China Unicom Zhejiang Branch's Child Moral Education Smart Care Application

China Unicom Jiangxi Branch organised a series of volunteer service activities under the theme of "Learn from Lei Feng to foster a new fashion", and took the initiative to visit local left-behind children at their school to care about their physical and mental health and learning conditions, and encouraged them to continue to work hard.

"Caring for Left-behind Children, Sharing Love Together for Mutual Growth" volunteer service activity of China Unicom Jiangxi Branch

Since 2020, China Unicom's Zhongxun Design Institute has organised public welfare education assistance activities called "Warmhearted assistance for learning, Unicom connects us" in Geji County, Ali, Tibet, which is located at an average altitude of 4,800 meters. Over the past three years, a total of RMB 1.52 million worth of books, winter clothing, and teacher's AI evaluation systems have been donated.

"Warmhearted assistance for learning, Unicom connects us" public welfare education assistance activity

China Unicom Shanghai Branch organised voluntary blood donation service activity, with more than 300 cadres and employees participating in voluntary blood donation.

Voluntary blood donation

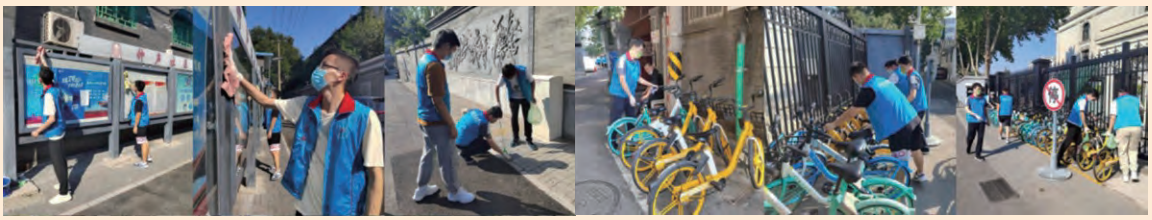
Wo Creation Community of China Unicom Jiangsu Branch is a social organisation aims to improve the innovation, entrepreneurship and social practice capabilities of college students. The community is under the guidance of the Jiangsu Provincial Committee of the Communist Youth League, supported by all levels of China Unicom Jiangsu Branch, managed by the Youth League Committee of colleges and operated by students.

Opening ceremony of the 10th Summer Camp in 2022

Deep Focusing on Environmental Protection

China Unicom adhered to the concept of sustainable development and paid close attention to environmental protection for a long time. Through various public welfare volunteer projects, the Company assisted in ecological protection and restoration, strived to create a green and clean ecological environment for the society, and to explicitly acknowledge and fulfill its corporate social responsibility.

Unicompay Company Limited actively organised young employees to visit Zhongsheng Community, Xicheng District to carry out volunteer service activities. By cleaning up small advertisements on the walls and picking up plastic bags, waste, cigarette butts and various garbage on both sides of the road, they helped maintaining a clean community and conveyed the concept of sustainable living, such as waste reduction at source and waste classification, to the public through practical actions.



China Unicom Hunan Yongzhou Branch actively practiced the concept of green development and organised the "I love Yongzhou, I plant a tree for Yongzhou" tree planting activity to contribute to the ecological environment of Yongzhou.

Relieving the difficulties faced by micro, small and medium enterprises

China Unicom actively responded to the call of the state and undertook the responsibility of a central state-owned enterprise. Through three major measures, namely rent reduction and exemption for micro, small and medium enterprises, settlement of outstanding accounts due to private enterprises and financing cost reduction for micro, small and medium enterprises, the Company spared no efforts to help micro, small and medium enterprises address difficulties and provided strong support for the prosperity and development of the socialist market economy. As at the end of December2022, the Group's accumulated rent concessions amounted to RMB293 million (RMB199 million reduction and exemption in medium-and high-risk areas in the pandemic), involving 6,910 small and micro enterprises and individual business owners in the service industry.

China Unicom Beijing Branch standardised the relevant processing procedures for rent reduction and exemption for SMEs and individual business owners in the service industry, providing support to effectively ensure the implementation of rent reduction and exemption. In 2022, the Company granted rent reduction and exemption to a total of 412 lessees of property leasing contracts that met the criteria, with an amount of RMB69,357,700.

China Unicom Wenzhou Branch actively carried out special work for the settlement of outstanding accounts due to private enterprises. Through a comprehensive investigation of the amounts due to private enterprises, it sorted out the causes of overdue amounts, established a detailed list, and regularly tracked the progress of the settlement of overdue amounts according to the nature, overdue time and overdue reasons. The Company carried out regular settlement of outstanding accounts due to private enterprises, focused on ensuring the payment to SMEs, and continued to promote the in-depth and solid implementation of the settlement of outstanding accounts.

China Unicom Hunan Branch actively promoted the construction of the financing service system for SMEs. The system was used to innovate financial services, alleviate the problem of information asymmetry, help SMEs to obtain financing more conveniently and quickly, help financial investment institutions to accurately identify corporate risks to strengthen investment confidence, ultimately reducing corporate financing costs, solving the problems of difficult, expensive and slow financing, and achieving the goal of "six stabilities" and "six guarantees" for helping enterprises.

SMEs Big Data Cockpit

Comprehensively Promoting Rural Revitalisation

2022 was a crucial year for China to consolidate and expand the achievements of poverty alleviation and effectively connect with rural revitalisation. The comprehensive promotion of rural revitalisation is a strategic deployment for building a modern socialist country in an all-round way and an objective requirement for the construction of socialism with Chinese characteristics in the new era. China Unicom insisted on making key contributions to rural revitalisation with the responsibility of "national team, key force and frontline troop", regarded digital village as the digital initiative to empower rural revitalisation, and facilitated rural production mode upgrade, governance model innovation and lifestyle improvement in a multi-measure, all-round and in-depth manner, so as to promote the unity of economic and social benefits, and create sustainable development and assistance models.

Shouldering responsibility and actively implementing the rural revitalisation strategy

China Unicom implemented the rural revitalisation policy with practical actions. On the basis of the original "Four New Projects", China Unicom made innovative breakthroughs to keep up with the times, and proposed to fully implement the "Ten Actions" and deepen the "Five New Projects". In accordance with the requirements of the initiatives, the Group clearly defined the overall goals and roadmap, and promoted the development of digital village construction in an orderly manner in five aspects, including infrastructure construction, digital tool base and industrial co-construction ecosystem, so as to write a new chapter of comprehensive rural revitalisation in the new era.

China Unicom Digital Village "Ten Actions" New Initiatives

"Five New Projects" for rural revitalisation

• The Company issued the "Key Points of China Unicom's Work in Supporting Rural Revitalization in 2022" to plan and deploy the work in four aspects, namely the promotion of rural communication infrastructure construction, agricultural transformation and upgrading, digital application promotion, and a new marketing service model, ensuring clear responsibilities and implementation.

• The Company held the 2022 Conference on Promoting Rural Revitalization to discuss the new achievements of digital rural construction and planned a new chapter of rural revitalisation with practical actions.

• A total of 1552 cadres were selected in 5 counties, 64 towns and 1152 villages for designated assistance by the Group.

Selected cadres for assistance in villages
1,552 people

• The actual poverty alleviation funds invested amounted to RMB229 million.

In 2022, China Unicom's efforts in rural revitalisation have been widely recognised. China Unicom's targeted assistance work has been rated as "good" for four consecutive years by the Central Rural Work Leading Group, ranking top among central state-owned enterprises. At the same time, the "China Unicom Digital Village Service Cloud Platform to Support Information Consumption + Rural Revitalisation" project was selected as one of the 2022 New Information Consumption Demonstration Projects by the Ministry of Industry and Information Technology. The Company received a letter of thanks from the MIIT and the Information Consumption Promotion Alliance of China for organising "information consumption supporting rural revitalization" activities.

For four consecutive years
the Company has received
the highest rating of "good"
in the assessment of the effectiveness of targeted assistance work by the central unit.

Over the past 22 years, China Unicom has provided cumulative unconditional assistance funds of
RMB 1.21 billion.

Trained a total of
44,500 cadres
and talents of various types for the designated assistance areas.

Benefiting farmers with digital means and paving the way for smart villages

The construction of modern rural infrastructure is an important material foundation for improving rural productivity and developing modern agriculture. As the national team in the operation and service of digital information infrastructure, China Unicom continued to build a digital village base, consolidating the foundation for rural revitalisation and development, and paving an information expressway for benefiting farmers with digital means and for smart villages.

Accelerating the construction of rural digital information infrastructure

The Company carried out the construction of "Digital Village" in more than 3,500 districts and counties in 31 provinces, autonomous regions and municipalities across the country, serving more than 230,000 administrative villages in total. The mobile network coverage of administrative villages nationwide was 95%, and the 4G coverage was 94.3%. After the 900MHz was re-farmed to 5G, the coverage of 5G administrative villages exceeded 70%, the national broadband network covered 26,000 towns and 312,000 administrative villages.

The Company carried out over 50,000 activities to care for the elderly and helped over 1.5 million villagers upgrade their digital intelligent terminals. A wide range of mobile phone training activities for farmers were carried out nationwide to empower 2.3 million people to improve their digital skills.

Optimising the construction of digital village public service platform

Relying on the advantages of its 5G digital infrastructure, China Unicom has independently developed the "Unicom Digital Village" platform, which has the features of full system, modularisation, rapid deployment and diversification, and has become a powerful tool for the government, the village committee and the villagers. By the end of December 2022, the "Unicom Digital Village" platform has covered 253,000 administrative villages and served over 22 million villagers.

In order to empower smart agriculture and smart tourism through information technology, China Unicom Henan Luohe Branch actively expanded 5G network coverage in township and hotspot rural areas. The Company invested RMB7.56 million to build 78 5G base stations in township and provided high-quality 5G services to 63,000 local farmers.

Rural network construction

China Unicom Shanxi Branch adhered to the working policy of radiating to the western region and striving to be the leader in the western region. It actively responded to and supported the business needs of all provinces in the western region. In Jinhua Village and Bageqi Village, Aksu, Xinjiang, China Unicom Shanxi Branch has customised and developed a digital village APP with local characteristics, and developed special functions such as Supporting Xinjiang and VR Party Building Museum. At the same time, it initiated the construction of the Big Data centre project for agriculture and rural areas, promoted the integration and sharing of basic data of agriculture and rural areas, expanded digital village applications for "agriculture, rural areas and farmers", and empowered the development of digital village through data, thus improving the overall informatisation level of the two villages.

Digital Village APP developed by China Unicom Shanxi Branch

Helping farmers get rich through industries and consolidating the achievements of poverty alleviation

Industrial revitalisation is the top priority of rural revitalisation. On the way of promoting agriculture and rural development with science and technology, China Unicom relied on the distinctive resources of agriculture and rural areas to actively carry out in-depth cooperation with ecosystem partners in live broadcast, education, tourism, media, terminals and finance. The Company cooperated with the government, industry associations and enterprises to promote the penetration of social resources to rural areas, and promote digital agriculture and digital commerce to boost agriculture.

In 2022, the Company implemented more than 500 digital agriculture and rural ecological service projects nationwide, vigorously supported the integrated development of primary, secondary and tertiary industries, and promoted the upgrading of the entire industrial chain in rural areas.

Since 2016, the Company has invested a total of RMB760 million in poverty alleviation funds and specially supported more than 3,000 digital industrial projects.

China Unicom actively explored combining its own business capabilities with rural revitalisation, sharing the development results and contributing to common prosperity while revitalising villages and benefiting farmers. For example, the Company combined digital village construction and digital technology to enable online sales of agricultural products, helping to cultivate a number of unique and high-quality agricultural product brands. For another example, China Unicom and village collectives jointly established the "Communication Cooperatives". Through the model of "digital village platform + village collective economic business cooperation", the digital villages were built and operated with cloud-network integration. By introducing the communication cooperatives as a project to strengthen the collective economy, the interests of the village collectives were expanded through the combination of "resource co-construction + terminal financing instalment".

Building distinctive industrial advantages

China Unicom Heilongjiang Branch built a modern agricultural park for breed cultivation base project based on 5G + agricultural Big Data in Wudalianchi. Through the 5G high-speed network and combined with Big Data capabilities, it realised the integrated data collection, analysis, processing and intelligent calculation, built an industrial chain operation system integrating primary, secondary and tertiary industries, realised the overall cost reduction and efficiency improvement of the base, solved the problem of fragmented and decentralised agriculture, so as to scientifically manage agricultural production. It effectively guided farmers for their farmland operations, and improved crop production and farmers' income. The project was selected as the MIIT 2022 Big Data Industrial Development Pilot Demonstration Project, and won the third prize of the World 5G Convention - 5G Application Design Competition.

Digital Agriculture Cloud Platform

The working team of China Unicom Shanxi Branch in Shangshile Village, Liyang Town, Heshun County actively sought agricultural projects suitable for the development of the village, and built a 50,000 sq.m. Shanxi cultivation base in Shangshile Village to support rural revitalisation with industrial revitalisation. The oyster mushroom industry realised a employment of hundreds of local people, and drove a steady growth in average monthly income of local people. With the support of the oyster mushroom industry, the per capita income of the village has reached RMB12,600, far above the local income poverty alleviation line of RMB 6,500.

Oyster mushroom harvest in Li Yang Town, Heshun County

China Unicom Yibin Sichuan Branch actively addressed the problem of fruit oversupply by launching live promotion activities in Gao County and promoting the construction of communication infrastructure in rural areas. The farmers spoke highly of the company's services and recommended them to others, and more farmers were able to achieve agricultural prosperity through using China Unicom's digital village services.

China Unicom Sichuan Branch helped farmers boost sales through live broadcast

Actively Fulfilling Overseas Responsibilities

China Unicom shouldered the mission of smooth domestic and international dual circulation and actively fulfilled its responsibilities to help China achieve high-level external development. China Unicom not only earnestly fulfilled its social responsibilities in China, but also actively fulfilled its overseas responsibilities in international operations. It achieved remarkable results in actively helping the global fight against the pandemic, participating in the "Belt and Road" initiative at a high level, and vigorously supporting the global poverty reduction cause.

Conscientiously operating international services

China Unicom relies on China Unicom Global (CUG) to establish a global customer service system and leverage its strong global network and service advantages. China Unicom is committed to becoming the "value creator of international digital services trusted by customers". It provides global operator customers, commercial and enterprise customers and mobile business users with global end-to-end integrated information services.

Sincerely providing excellent cross-border business

China Unicom actively implemented the requirements of five main responsibilities and main businesses. At present, it has formed five product systems, namely Big Connectivity, Big Computing, Big Data, Big Application and Big Security. Through an international interconnection bandwidth of more than 100 Tbps connecting to five continents of the world, it provided digital empowerment for people and enterprises in these countries, and promoted the stable and healthy development of the global digital economy.

• **Providing diversified services.** In order to meet the needs for express lines, the Company launched in total 156 express lines and achieved rapid fulfilment. In response to the needs of enterprises, the Company launched a new 10099 SLA support service, launched the "computing power centre + DC Internet access + X" IDC full-stack product, launched the Global Unicom Cloud service, global intelligent networking solution service, etc. In response to the demands for global cloud SMS, the Company provided A2P, a dual-node, cross-network and cross-cloud deployment platform, which reached over 200 countries and regions around the world. In response to the needs of various vertical industries, the Company provided solutions for eight major industries, namely manufacturing, energy, retail, warehousing and logistics, finance, government, TMT and media, as well as integrated security services including phishing mail drills, Sky Engine, vulnerability scanning, cloud WAF, cloud shield, terminal security services and information security consulting services. In respect of Big Data, the Company provided Big Data visualisation platform, Wokelai marketing platform products, and Big Data intelligent park, automotive industry solutions and other services.

• **Providing high-quality services.** After years of development, China Unicom has more than 130 business access points around the world, and has established international Internet interconnection with more than 140 operators around the world, and 4G international roaming access to 210 countries and regions; 5G international roaming access to 45 countries and regions; data roaming is accessible to 249 countries and regions. In 2022, the data centres provided by China Unicom through cooperation covered 43 countries and regions. At the same time, the Company actively promoted the construction of cross-border projects, and put into operation cross-border land cable with the capacity of more than 9 Tbps in 2022. The capabilities of cloud network and computing power were significantly improved. The total storage capacity of overseas cloud resources reached 45,000-core vCPU and 17,000TB, 4 times larger than the vCPU scale at the beginning of the year. The storage capacity in Hong Kong reached 9,000-core vCPU and 1,400 TB, representing an increase of 50% from the beginning of the year.

Over **130** global business access points

4G international roaming accessible to **210** countries and regions

5G international roaming accessible to **45** countries and regions

Data roaming accessible to **249** countries and regions

Building a digital Silk Road

China Unicom deeply implemented the Belt and Road Initiative, actively participated in and fully promoted the construction of the Belt and Road. It was always full of confidence in the construction of the Belt and Road, and continuously promoted the high-quality development of the Belt and Road Initiative.

• **Enabling connection of facilities in the "Belt and Road".** In accordance with the "Belt and Road" north, middle and south routes planning, the Company has built a multi-path, multi-system, secure, stable and high-quality information optical channel for the Silk Road Economic Belt. The Company has further constructed high-quality transmission lines between Asia and Europe along the north route, worked with the Central Asian countries to build an ultra-low latency channel between Asia and Europe along the middle route, and formed international multi-way access capability with submarine and terrestrial cables along the south route. In 2022, the capacity of submarine cables in the "Belt and Road" direction increased from 26.9T to 44.8T, and the total capacity of cross-border terrestrial cables increased from 20.1T to 25.6T, which enable access to major countries and regions along the "Belt and Road".

• **Promoting network improvement for the "Belt and Road".** China Unicom actively responded to the national initiative and stepped up its efforts in network layout and project construction along the "Belt and Road". The Company invested more than RMB550 million along the "Belt and Road", and set up 30 branches around the world, half of which are located along the Belt and Road, offering high-quality digital services for "out-going" enterprises. In 2022, China Unicom continued to lead in international Internet quality. According to the MIIT Report, China Unicom delivered the best Internet quality among the basic telecom operators in terms of latency and packet loss performance for 20 consecutive months. In 2022, the Company newly established five overseas access points in the "Belt and Road" regions, including Jakarta in Indonesia, Vladivostok in Russia, Phnom Penh in Cambodia, Manila in the Philippines, and Muse in Myanmar.

• Driving joint development of the "Belt and Road": On the one hand, the Company continued to strengthen the construction of the core friends circle of the "Belt and Road". This was achieved through joining industry alliances, joining the global operator open collaboration platform, promoting cooperation with key customers for joint development. The Company actively carried out ecological cooperation such as multi-cloud platform, network and information security, supply chain, system integration and smart city, and privileges. The Group has established ecological partner system, international roaming partner system, industry solution partner system and cloud computing service partner system with more than 300 carriers, more than 500 mobile carriers, more than 130 ICT enterprises and 12 major cloud providers in the world respectively, to achieve mutual benefit and win-win. On the other hand, China Unicom has become the "chief consultant of international smart applications for inbound and outbound business and travel customers" by providing preferential products and services for public users in countries along the "Belt and Road".

The capacity of submarine cables in the "Belt and Road" direction reached

44.8T

The capacity of cross-border terrestrial cables in the "Belt and Road" direction reached

25.6T

Fulfilling overseas social responsibility

China Unicom actively participated in overseas charity activities, and promoted the spirit of love, mutual assistance and care for the community. It also carried out activities such as caring for women's health, environmental protection, care for vulnerable groups and supporting local communities to fight against the pandemic, in order to contribute to the society and fulfil its overseas social responsibilities.

Through social media platforms such as SMS, WeChat and Facebook, the Group released pandemic updates and anti-pandemic tips to the whole network, and vigorously promoted the new version of My CUniq APP and CUniq online shopping mall. Since the fifth wave of the pandemic, the Company sent a total of 860,000 SMS messages in three times, encouraged the public to use online self-service 7x24 at home instead of leaving home to minimise gathering. The Company participated in the "Central Government's Assistance to Hong Kong – Health Guard YouAndMe" activity, distributed the CUniq 5G Luna Card (Public Welfare Version), offered warmth to the youth and children's families, and helped each family solve problems such as communication and remote courses. The Company gave away 2,000 anti-pandemic gift packs to Hong Kong citizens, and provided 100 5G routers and 300 phone/Internet cards to people with urgent needs for Internet service, met the network and communication needs of some citizens under the pandemic.

CUG participated in the "Central Government's Assistance to Hong Kong – Health Guard YouAndMe" activity

In September 2022, CUG participated in the "Caring for the Community – Celebrating the Return of Hong Kong, the Mid-Autumn Festival and the National Day and caring for the elderly visiting activity" and "Celebrating the return of Hong Kong and the National Day and caring for the elderly - home visit for the elderly who live alone" activities organised by the Hong Kong Chinese Enterprises Association, offered warmth to the elderly in the community.

CUG offered warmth to the elderly in the community

Over the years, CUG has participated in the Hong Kong charity sale of "HKFHY's Cookies - Gift for Love" organised by the Hong Kong Federation of Handicapped Youth and provided help to those in need. In 2022, CUG obtained the "Caring Company" certification and received the special award certificate from the organiser. CUG awarded the "Caring Company" certification for five consecutive years.

CUG participated in the Hong Kong charity sale

Actively protecting local people's livelihood

China Unicom carried out various business activities overseas in compliance with laws and regulations. Under the principle of "one set of regulations, one system and one framework", it continued to optimise the agile and smart supply chain, actively employed local employees, strictly abided by the local market order, business rules, social customs and cultural habits, and strives to build a mutually beneficial and win-win development community.

Developing local supply capacity	In 2022, China Unicom's overseas procurement and supply centre relied on the local market, aiming to build a secure, efficient and flexible smart supply chain system. In terms of procurement policy, it was based on the Group's procurement policy, the Company formulated localised procurement strategies according to local conditions, issued 1 first-level system, 2 second-level systems, 4 third-level systems, and revised 1 third-level system. The Company completed the export of short list of overseas hotspot areas to 20 cities. In 2022, the localised procurement rate was 100%.
Adhering to green and low-carbon operation	The Company strengthened the supervision and control of energy conservation, environmental protection, health and safety from the formulation of procurement plans, aiming to support low-carbon and low-energy consumption partners. The Company continuously improved the greenness of communication network infrastructure, further promoted energy conservation and carbon reduction, prevented the negative impact of implementation projects on the local area, and protected the local ecological environment. In 2022, the Company won the Certificate of Merit of the Hong Kong Awards for Environmental Excellence.
Focusing on local talent employment	The Company actively solved the problem of local employment and other livelihood issues, vigorously promoted the "Bauhinia Plan" and "U Talent Recruitment and Training Plan" of the CUG, to provide more employment opportunities for local young talents. In 2022, China Unicom Global Limited had a total of 918 overseas employees, including 349 foreign employees; it had 351 overseas female employees, with the proportion of female employees continuing to increase.
Protecting the rights and interests of local employees	In strict accordance with the legal requirements in the employment location, the Company safeguarded the legitimate rights and interests of local employees. It has formulated a remuneration and welfare system respecting local customs. It formulated differentiated monetary subsidies and actively organised recreational activities and welfare publicity, etc., fulfilling its social responsibility of caring local employees with practical actions. It was awarded "Green Office Award 2022" certification by World Green Organisation, and recognised as a "Good MPF Employer" by the Mandatory Provident Fund Schemes Authority of Hong Kong.
Carrying out compliance and integrity business operations	China Unicom adhered to the bottom line of overseas compliance operations. In 2022, China Unicom continued to improve its overseas compliance management system based on the unified deployment of the CUG in accordance with the "Compliance Management Enhancement Year" and the actual situation of overseas operations, effectively ensuring global compliance operations. • The compliance manual of overseas operating companies was updated on a rolling basis to provide legal guidance for overseas compliance operations; • Organised and carried out a number of risk investigations and improved the long-term risk management mechanism; • Focused on major risk issues, actively and properly responded to them, and made every effort to protect the legitimate rights and interests of the Company; • Organised compliance and contract training to enhance employees' awareness of risk prevention and ensured compliance operations. In 2022, there were no incidents of dishonesty, violation of laws and regulations and disorderly competition, nor were there any incidents involving infringement of the rights of indigenous people and commercial bribery.

Awarded the "Green Office" certification by the World Green Organisation

Striving to be a "Practitioner" of Ecological Civilisation Construction

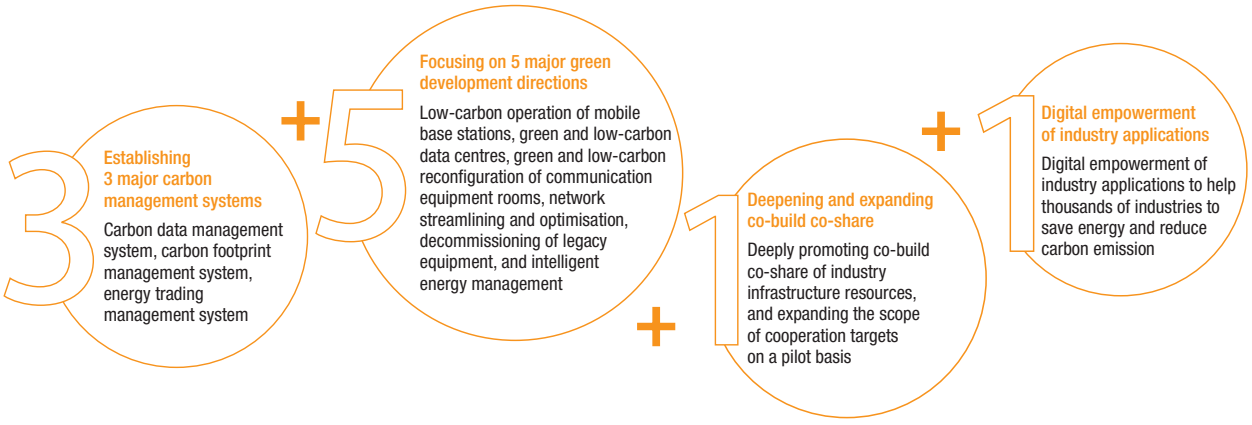
People live up to lucid waters and lush mountains. Adhering to the concept of green development, China Unicom actively responded to the threat of climate change, improved the green management throughout the full life cycle of products, coordinated and promoted green management, network construction, operation and other work, built a green supply chain, innovated information-based solutions, empowered the green development of the whole society, thereby contributing to carbon peak and carbon neutrality, and promoting the formation of a green and low-carbon production mode and lifestyle.

Fulfilling the Responsibilities of Climate Governance

China Unicom attached great importance to tackling climate change and fully implemented policies and systems such as the "Opinions on Completely, Accurately and Comprehensively Implementing the New Development Concept to Realise Carbon Neutrality and Carbon Peak" and the "Action Plan for Carbon Peak by 2030". It complied 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. In 2022, there was no violation of laws and regulations in the environmental field.

Optimising the green management system

Following the decision and guidance of the "Carbon Peak, Carbon Neutrality" Management Committee, the Company established and improved the "Carbon Peak, Carbon Neutrality" management system. According to the "Carbon Peak, Carbon Neutrality" 14th Five-Year Action Plan of China Unicom, the Company implemented the "3 + 5 + 1 + 1" action plan. In terms of low-carbon operation, research and development of energy-saving and carbon-reduction technologies, and sustainable use of resources, the Company took a number of improvement measures to comprehensively, systematically and deeply promote energy-saving and carbon-reduction work, so as to improve the effectiveness of environmental protection. With the goal of green and low-carbon circular development, the Company 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 reduce the carbon dioxide emissions per unit of GDP by more than 65% as compared with 2005. It is expected that by 2025, the comprehensive energy consumption per unit of information flow will decrease by about 20% compared with 2020, and the comprehensive energy consumption per unit of telecommunications business will decrease by about 15% compared with 2020.



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

Actively responding to climate change

Under the framework of national policies, regulations as well as listing rules, the Company comprehensively considered factors such as legal compliance, strategy, operation and information technology to organise climate change risk identification and assessment on an annual basis, strengthened climate change risk management, and conducted special risk identification and assessment on specific projects from time to time.

List of Climate Change Risks

Risk type	Risk categories	Risk descriptions	Time horizon	Countermeasures
Transition risks	Legal and policy risks	The goals of carbon peak and carbon neutrality have led to more stringent measures to limit greenhouse gas emissions, and the carbon emission statistics and accounting system has been gradually standardised.	Short to medium-term	Complying with the carbon emission trading system and reducing emissions, completing carbon emission accounting and quota performance, and regularly tracking the development of climate change-related laws and regulations.
	Technology risks	With the evolution of 5G technology, the energy consumption of equipment has increased significantly compared with 4G, and the number of base stations has increased several times. The Company faces greater challenges in energy conservation and consumption reduction.	Short to medium-term	The Company innovatively proposed a 4G/5G collaborative intelligent energy-saving system, developed and used energy-saving technologies in 5G networks, data centres and other facilities, improved energy-saving and carbon-reduction monitoring and management methods, and carried out network streamlining and energy-saving transformation.
	Market and reputation risks	Sustainable development has become a global consensus. Individual and household subscribers were more inclined to use low-carbon services. The process of green transformation of the industry is accelerating, and more and more stakeholders are concerned about the Company's climate actions.	Short to medium-term	To monitor market changes, promote paperless services, enrich product offerings, launch information-based solutions such as emission reduction and carbon reduction, smart water conservancy and environmental monitoring, timely disclose the progress of the Company's ESG work, promote the concept of green development, and establish a responsible brand image.
Physical risks	Acute risks	Extreme weather such as floods, snowstorms, earthquakes and mudslides may cause various degrees of damage to equipment and facilities, and threaten the safety of personnel.	Short to medium-term	To improve disaster prevention and emergency plans, carry out potential danger investigation in advance during flood season, and organise emergency drills. The emergency command and dispatch centre implements 7×24-hour on-duty to achieve rapid response.
	Chronic risks	Global warming resulted in an impact on the operation, maintenance and power consumption of communication facilities, and the rise of sea level may cause damage to coastal equipment and facilities.	Medium to long-term	To allocate special funds for energy conservation and emission reduction, actively promote the energy-saving transformation of communication infrastructure, improve the comprehensive energy utilisation efficiency, and strengthened coastal flood prevention facilities.

Achieving Low-carbon Production and Operation

Promoting green and low-carbon production

China Unicom actively promoted the intelligent transformation, energy-saving innovation and green upgrading of communication infrastructure to improve comprehensive energy utilisation efficiency. The Company enforced strict control from the source of equipment procurement, promoted the green management throughout the full life cycle of products, allocated RMB168 million of special fund for energy-saving transformation, and continuously improving the greenness of communication network infrastructure.

Promoting energy saving and consumption reduction in 5G network

• Focusing on equipment, sites, and networks, the Company achieved low-carbon operation of base stations without affecting subscribers' network use. At the equipment level, it actively introduced technologies such as high bandwidth and multiple antennas, gradually improving the integration and energy efficiency of 5G equipment. At the site level, through co-build co-share, centralised machine room deployment, outdoor site deployment and the use of natural cold sources to reduce air conditioning energy consumption, it significantly improved site efficiency. At the network level, the Company adopted artificial intelligence algorithms to predict base station traffic trends and automatically optimised by shutting down some active devices based on time, frequency, space, power and other dimensions.

• Based on the hierarchical energy-saving architecture comprising network level, site level and equipment level, the Company innovatively proposed a 4G/5G collaborative intelligent energy-saving system, realising intelligent energy-saving management of wireless networks, and intelligent control of power supply and other basic peripheral facilities.

• The Company utilised artificial intelligence to forecast base station traffic and put base stations in deep sleep during zero or low traffic windows, with the ability to wake up within seconds. This technology saved approximately 20 million kilowatt-hours of electricity and reduced carbon emissions by about 5,400 tonnes annually without compromising subscriber's experience.

• The Company improved the monitoring and management methods of energy conservation and carbon reduction, realised the simultaneous deployment of energy consumption monitoring of new power facilities, and the simultaneous implementation of energy consumption monitoring of existing power facilities and transformation projects.

China Unicom Research Institute, forged core independent capabilities and achieved industry-leading levels of 4G/5G collaborative intelligent energy-saving management platform technology. In 2022, the Company was awarded the "Top 10 Copyright Owners of 2021" by the China Copyright Protection Center and was selected as an "Excellent Case of Green and Low-Carbon Development in the Information and Communication Industry for 2022" by the China Communications Enterprise Association. The platform was also included in the 2022 World Internet Conference's "Charm of Science and Technology" achievement manual. The platform's pilot promotion in Tianjin and other provinces showed significant results, with annual cumulative electricity cost savings exceeding RMB 12 million.

The collaborative intelligent energy-saving platform for 4G/5G has shown significant results in pilot applications on live networks

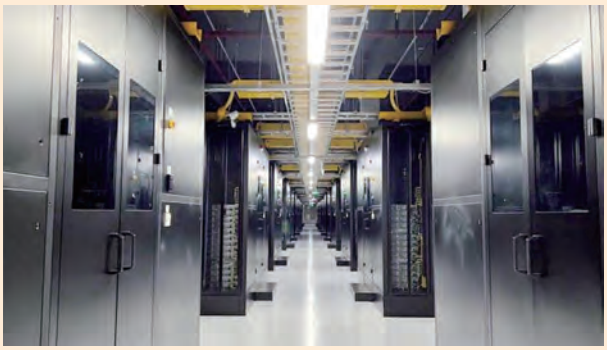
Building green data centres

• The Company adjusted the layout of its data centers and relying on the "Eastern Data and Western Computing" project, actively guided the construction of non-real-time data centers to move to western regions, using green energy generation in the western regions to alleviate energy consumption pressure.

• The Company strictly adhered to national and local environmental protection regulations for the construction of new communication equipment rooms (including data centers). It built a dual-carbon demonstration park and constructed a green and centralised, secure and reliable computing power infrastructure. The first large-scale new integrated power supply equipment was put into operation in the Hohhot base.

• The Company created the first centralised evaporative cooling air conditioning system in China, a practical case in the field of cloud data centre machine rooms, achieving optimal operational efficiency. This technology uses water evaporation to absorb heat and renewable energy from outdoor dry air to achieve natural cooling of data machine rooms. The Company built the world's largest data centre indirect evaporative cooling water system cluster application, which achieved a 65% reduction in annual energy consumption compared with traditional cooling and air conditioning systems.

China Unicom's Shenshan Cloud Data Center is located in the Shenshan Cooperation Zone of Shenzhen, Guangdong Province, a hot and humid area with an average wet bulb temperature of 27.8°C during the summer. Without using new energy-saving products such as evaporative cooling, magnetic levitation units, and fluorine pumps, Unicom Guangdong branch relied on refined operation to tap its potential, and achieved an advanced level of traditional centralised water-cooling air conditioning system PUE of 1.23 annually through management methods such as PUE factor analysis, coordinated operation of cooling system conditions and IT loads, and won the "Leading List" and "2022 Green and Low-carbon Energy-efficient Big Data Center" of China Finance TMT.



Building 2, Shenshan Cloud Data Centre

Promoting green and low-carbon technology for energy conservation

• The Company introduced high-voltage direct current and direct power supply technologies to optimise the air flow of the server room and improve the cooling efficiency. The Company conducted in-depth research on key technologies for energy conservation of 5G network peripheral equipment, installed small air-conditioning and energy-saving equipment such as fresh air ventilator, and made full use of clean energy, appropriate hibernation, time-specific shutdown and other measures to effectively reduce the high energy consumption of 5G.

• After construction was completed, the Company conducted electromagnetic radiation testing on the base stations and made the results public, accepting public supervision to ensure that the electromagnetic radiation from the base stations met the requirements of national standards.

Building a green supply chain.

• The Company enforced strict control from the source of equipment procurement, separately set out green and low-carbon requirements, and increased its weighting in active equipment procurement by 20%. The Company promoted green management throughout the life cycle of products, advocated green logistics, required suppliers to provide products that meet the requirements of green packaging, and imposed strict penalties on unqualified products in energy consumption.

Promoting green and low-carbon operation

The Company attached great importance to energy saving and consumption reduction in its operations, actively promoted paperless services, improved the level of digital office, strengthened energy consumption control requirements in office premises, and required rational use of water resources to further improve the efficiency of resource utilisation.

• **Promoting paperless services.** The Company launched the "Electronic Business Registration Form for Non-physical Business Outlets" function nationwide, and recommended users to use it through China Unicom APP, China Unicom Online Business Outlets, 10010 hotline and other channels, with a total of 125 million transactions completed and more than 546 tonnes of paper saved.

• **Practising green office.** The Company improved and optimised the management system of energy and resources conservation, strengthened the target management of water consumption, electricity consumption and energy consumption, and timely completed China Unicom's carbon emission accounting and quota performance in 2021. It optimised the operation plan of air conditioning, elevators, lighting and other facilities in office buildings, and carried out energy-saving transformations.

• **Reasonable utilisation of water resources.** The Company strictly complied with the relevant requirements of the Water Law of the People's Republic of China and the Law of the People's Republic of China on the Prevention and Control of Water Pollution. In the main water resource usage scenarios, such as water-cooled air conditioning systems and domestic water use, water-saving technologies were adopted to improve water resource recycling. Necessary water appliances were added to the office building, and measures such as using residual boiled water and tea water for cleaning and watering flowers after cooling, and collecting rainwater for outdoor green space irrigation were taken to increase recycling. The reclaim water systems of buildings were improved to reduce the use of tap water. The cooling tower make-up water and return valves were adjusted to prevent water overflow. The water flow of buildings' faucets was adjusted to avoid splashing and waste. The Company's daily office and production and operation water mainly came from the unified water supply of the municipal government, and there was no risk of water pollution.

• **Improving the utilisation rate of materials.** The Company increased the internal revitalisation of idle resources and revitalised materials amounting to RMB180 million. The Company strengthened the recycling of materials and reduced waste pollution. The Company completed the public auction for the disposal of scrapped assets of RMB630 million through the Internet auction platform, of which RMB90 million was from the disposal of rechargeable batteries and RMB540 million was from the disposal of other scrapped assets.

The Company vigorously promoted trade-in programs and provided convenient door-to-door service to upgrade devices, thus reducing the pressure on the environment.

Recycled amount upon scrappage and disposal

RMB **630** million

• **Spreading the concept of low-carbon and environmental protection.** Internally, the Company organised publicity activities and employee trainings such as the National Energy Conservation Publicity Week and the Low Carbon Day, and increased publicity efforts on low-carbon technology innovation, energy conservation of 5G base stations for the Winter Olympics, and solar energy application. A number of typical cases of green and low carbon cases were selected as the "2022 Model Cases of Carbon Peak and Carbon Neutrality Action".

Energy-saving and emission-reduction special investment (RMB mil)

↑ 36.6%

2022	2020
168	123

Greenhouse gas emission (Mil tonnes)

↓ 5.6%

2022	2020
13.4	14.2

Energy savings (1,000 tonnes of standard coal)

↑ 9.8%

2022	2020
269	245

Energy consumption per unit of information flow (kg of standard coal/TB)

↓ 14.3%

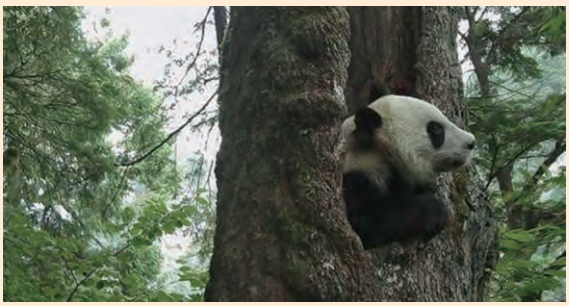
2022	2020
2.4	2.8

Empowering the Green Development of Society

China Unicom actively leveraged the important role of 5G in promoting the green transformation of the industry, accelerating the process of energy conservation and emission reduction, and protecting the natural ecology. The Company launched digital solutions for carbon reduction, smart water conservancy, environmental monitoring and energy consumption management, empowering the green transformation and upgrading of various industries.

Empowering ecological and environmental protection

The Company supported ecological protection with digital technology integration and innovation, and have developed a number of solutions such as China Unicom's smart water conservancy and smart ecological environment. The Company provided applications for smart river and lake management, smart sand mining and other fields. Such protections have been widely applied in provinces along the Yellow River, such as Henan, Qinghai and Gansu, and rivers under the administration of the Yellow River Conservancy Commission, to support precise pollution control in areas such as water environment, atmospheric environment, pollution sources and hazardous solid waste, and help protect biodiversity.



Infrared cameras successfully captured an image of a wild panda

In the Sichuan Fengtongzhai National Nature Reserve, China Unicom Sichuan Branch has created a 24-hour integrated monitoring system, a power supply system, an intruder dissuasion system and a high-quality network transmission system. Located in the Qionglai Mountain series, a key corridor belt for the habitats of pandas, the nature reserve plays an important role in promoting the genetic exchange among the panda population. Through the infrared cameras, a precious picture of a wild panda playing in the tree cave was successfully filmed.

Empowering the green transformation of industries

Focusing on the adjustment of industrial structure and the improvement of resource and energy utilisation efficiency, it has been a direction of China Unicom to promote the deep integration of emerging technologies such as the Internet, Big Data, AI and 5G with green and low-carbon industries. In 2022, the Company submitted the "5G Full Connection and Integration Network to Empower Green and Intelligent Manufacturing" solution and won the third prize for Green Manufacturing in the 5th "Blooming Cup" 5G Application Collection Competition.

To address issues such as waste of resources, environmental pollution and ecological damage caused by unreasonable mining development, China Unicom relied on its smart mine team to launch three major solutions including "5G network construction, intelligent equipment transformation, and intelligent management and control of mining", thereby promoting the development of the mining industry towards safe, green, intelligent and efficient development.

China Unicom Fujian Zhangzhou Branch entered into a cooperation agreement with Zhangzhou Keneng in relation to a "5G + Industrial Internet" digital project. Both parties would integrate and upgrade each other's advantages based on China Unicom's "Energy Consumption Cloud" platform and Keneng's "Energy Cloud" platform to jointly build an energy consumption management cloud platform of Zhangzhou and create typical application scenarios of "5G + Industrial Internet". Through 5G + unmanned inspection system in power distribution room, 5G + intelligent fault early warning, 5G + intelligent security, 5G + distributed power monitoring, 5G + intelligent charging piles and other 5G innovative applications, the Company provided enterprises and parks with smart and green industrial Internet solutions such as safe energy use, energy consumption management, operational management, etc., to create an industry benchmark for energy consumption management.

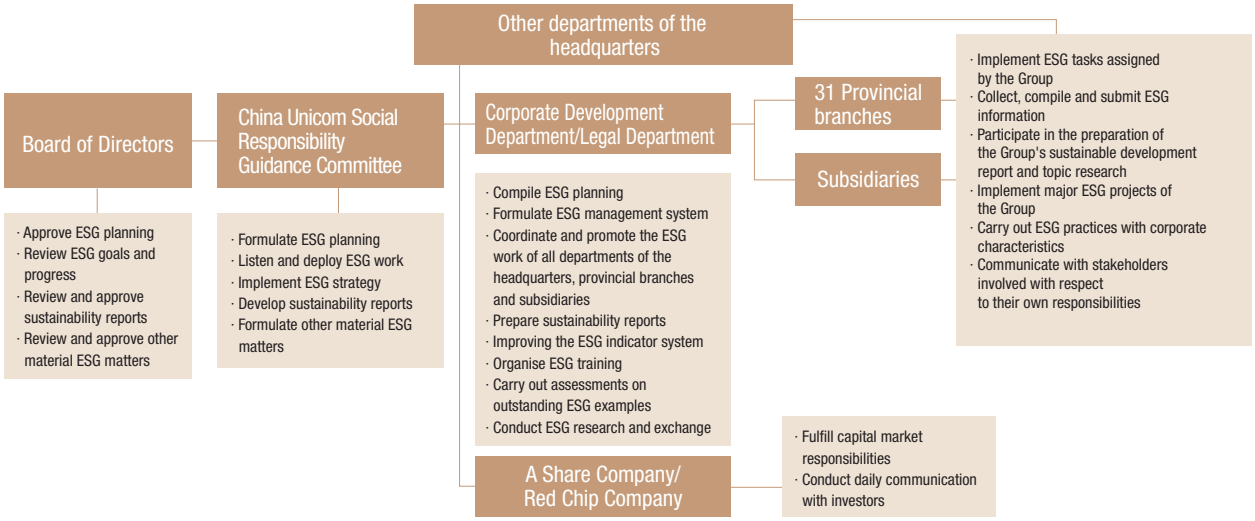
China Unicom Shanxi Branch actively responded to the call of "dual carbon" action and, through 5G digital empowerment, comprehensively penetrated the whole production process of Jinnan Steel, realising automation of production process and refinement of production management, which in turn enabled quality improvement, cost reduction and efficiency enhancement as well as green, low-carbon and environmentally friendly development for the traditional iron and steel industry.

Jinnan Steel's 5G + Industrial Internet Architecture

SUSTAINABLE DEVELOPMENT MANAGEMENT

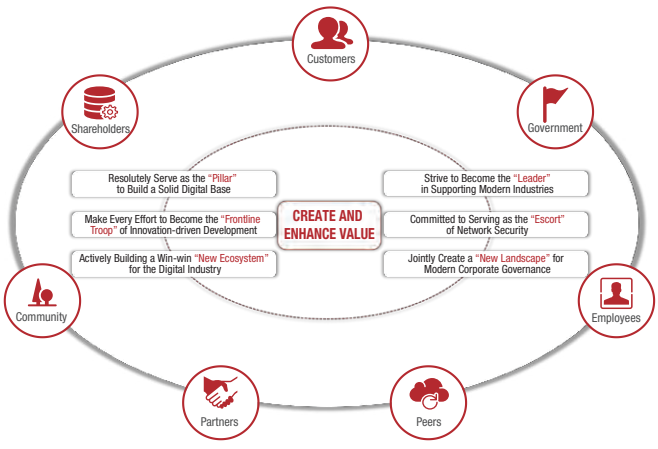
Sustainability Development System

The Board of Directors of China Unicom attaches great importance to the supervision of ESG related matters, and is responsible for formulating the Company's ESG management policies and strategies, including evaluating, prioritising and managing the Company's material ESG-related matters. The Board of Directors has been actively managing ESG risks and opportunities, integrating sustainable development with business practices, and incorporating climate and ESG-related risks into the risk identification and assessment process for analysis to ensure that the Company has established an effective risk management and internal control system. The Board of Directors continuously supervised the Company's risk management and internal control system, regularly listened to the Company's reports on ESG-related work, reviewed the Company's performance, gave opinions and instructions to the management and relevant departments on ESG optimisation, and approved the disclosure of the Company's ESG report. The Company promoted sustainable development practices in an orderly manner to achieve healthy and sustainable development. The Board of Directors authorises the Company's Social Responsibility Guidance Committee to be responsible for the implementation of environmental, social and governance strategy and related operational matters. The Social Responsibility Guidance Committee regularly reports and puts forward suggestions on environmental, social and governance matters to the Board of Directors. The Corporate Development Department/Legal Department is responsible for the daily work. Other relevant departments of the Group, the provincial branches and subsidiaries are responsible for environmental, social and governance implementation and carry out responsibility practice in their respective business specialisations.



China Unicom Sustainability Working Organisation and Main Responsibilities

China Unicom has always been committed to integrating its own development with broader sustainable development to achieve the harmonious unity of the Company's interests and social objectives. In 2022, China Unicom continued to lead by the new development philosophies of innovation, coordination, green, openness and sharing. The Company implemented Cyber Superpower, Digital China and Smart Society construction, etc. with practical actions. The Company formulated the China Unicom sustainable development strategy system and expressed its willingness and attitude to assume the responsibility of sustainable development.



ESG Development Strategy and Action Plan

Management of Material Issues

Identification of material issues

China Unicom has established a substainability issue selection process based on the principle of "closely following standards, regularly updating and continuously improving". By keeping abreast of domestic and international situations and social hotspots, China Unicom continuously benchmarked against advanced enterprises and updated substainability issues. In 2022, the Company led the practise of corporate responsibility with six substantial issues to ensure that the fulfilment of responsibility meets the needs of society and people's livelihood and responds to the concerns of stakeholders.

1 Identifying the source of issues

Based on the major domestic and international standards, the Company extensively collected internal and external social responsibility source materials based on the concerns of public opinions and the trend of issues of domestic and foreign communication enterprises and related enterprises.

2 Establishing the pool of issues

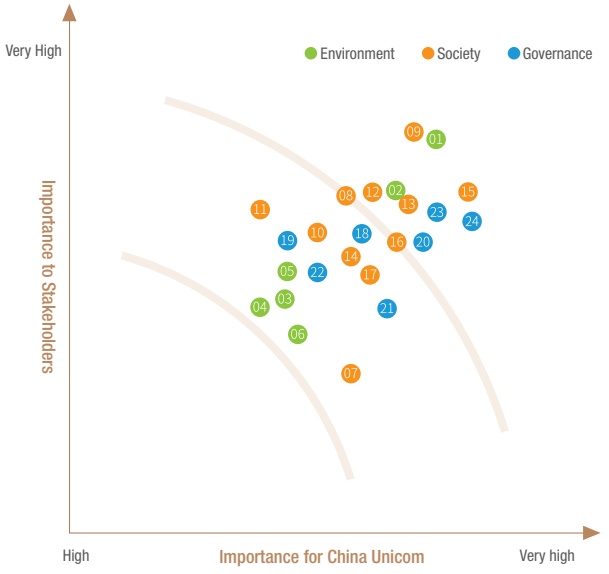
With reference to the feedback from stakeholders such as customer service hotline record, supplier interview record, employee questionnaire and media analysis report, China Unicom's sustainability issues were formed.

3 Prioritising the issues

The importance of issues will be prioritised in accordance with major disclosure guidelines and the issues selection matrix based on two dimensions: "impact on operations of China Unicom" and "importance to stakeholders".

4 Review and confirmation

The sustainability issues selected were subjected to review before the sustainability issues of China Unicom for 2022 were confirmed.



01 Energy and greenhouse gas emissions
02 Climate change
03 Recycling of Resources
04 Water protection and safety
05 Green development
06 Waste management
07 Emergency Communication Guarantee
08 Smart City Construction
09 Talent Management
10 Human rights and labour rights
11 Occupational health and safety
12 Diversity, equality and inclusion
13 Rural revitalization
14 Product and service quality
15 Privacy and data security
16 Promoting social and economic development
17 Social welfare
18 Legal compliance
19 Business ethics
20 Anti-monopoly
21 Risk Management
22 Corporate governance
23 Intellectual Property Protection
24 Industrial ecological construction

China Unicom Sustainability Issues Selection Matrix

The six major core issues of China Unicom in 2022 were determined through the analysis and selection of the issues collected according to the procedures for selection of sustainability issues and the issues selection matrix.

Resolutely Serve as the "Pillar" to Build a Solid Digital Base

Make Every Effort to Become the "Frontline Troop" of Innovation-driven Development

Actively Building a Win-win "New Ecosystem" for the Digital Industry

Strive to Become the "Leader" in Supporting Modern Industries

Committed to Serving as the "Escort" of Network Security

Jointly Create a "New Landscape" for Modern Corporate Governance

ESG Resources Allocation and Trainings

The Company is well-resourced in ESG, with a team of experienced staff in the Corporate Development Department/Legal Department who have been involved in ESG-related work for many years. China Unicom Research Institute has a professional ESG research team supporting the ESG work of the Company, and sufficient budget for ESG training, reporting, publicity and communication every year.

The Company attaches importance to developing the professionalism of its staff in the field of ESG and regularly participates in ESG training and exchange sessions organised by SASAC and other institutions. In 2022, department leaders and relevant personnel responsible for ESG work took part in the "ESG China Forum 2022 Spring Summit", the "ESG China Forum 2022 Summer Summit", "ESG training session for listed companies of central enterprises" and "Corporate ESG Management and Performance Improvement Pro Bono Project". In 2022, the trainings covered more than 100 person-times and lasted for 50 hours.

Communication with Stakeholders

China Unicom has established a sustainable development responsibility communication mechanism for continuous and targeted communication based on the expectations of stakeholders and sustainability issues.

Practical Issue	Stakeholder	Communication method	Expectations for Linktone
Resolutely Serve as the "Pillar" to Build a Solid Digital Base	Government	• Meetings • Face-to-face communication	• Fair competitive market order • Improve efficiency and reduce costs
	Customers	• Meetings • Service hotline • Weibo/WeChat • NPS (Net Promoter Score) survey	• Accelerating the construction of premium 5G network • Building a gigabit broadband premium network connecting thousands of households • Affordable and transparent price policy • Convenient and efficient service assurance
	Partners	• Interviews, hotline • Regular high-level mutual visits with partners	• Promote partners' accountability • High-quality network in remote areas • Fully promote "basic connectivity" to "Internet of Everything" • Accelerating the establishment of new advantages of computing-network integration
Strive to Become the "Leader" in Supporting Modern Industries	Government	• Meetings • Face-to-face communication	• Digital government provincial governance • Building a big data platform for government intranet • Promote the development of digital economy and upgrade of information consumption • Supporting modern industrial data governance
	Customers	• Meetings • Service hotline • Weibo/WeChat	• Innovative smart network services • Launch of digital solutions in key industries • Digital Empowerment of People's Livelihood Services
	Partners	• Self-service portals of partners • Regular high-level mutual visits with partners	• Form integrated solutions with China Unicom characteristics • Accelerating the extension of industrial internet to core production links • Realise visualisation of production process • Provide safe and reliable data and computing support

Practical Issue	Stakeholder	Communication method	Expectations for Linktone
Make Every Effort to Become the "Frontline Troop" of Innovation-driven Development	All stakeholders	• Meetings • Interviews • Weibo/WeChat	• Increase the proportion of scientific and technological personnel • Increase the proportion of R&D investment • Smart products to improve quality of life • Innovative forward-looking communications technology • Management System Adapting to Digitalisation, Network and Intelligence
Committed to Serving as the "Escort" of Network Security	Government	• Meetings • Face-to-face communication	• Security services during important periods • Zero data leakage
	Customers	• Meetings • Service hotline • Weibo/WeChat	• Network information security assurance • Personal privacy protection • Accelerating the marketing of innovative products
	Partners	• Partners' conference • Meetings, interviews • Self-service portals of partners	• Promote rapid, healthy and controllable development of network security industry • Promote the development of basic network security platform • Organising seminars to carry out ecological exchange
Actively Building a Win-win "New Ecosystem" for the Digital Industry	Partners	• Partners' conference • Meetings, interviews • Self-service portals of partners • Regular high-level mutual visits with partners	• Wide scope of cooperation • Fair and open opportunities for cooperation • Extensive and convenient supporting services • Promote the cultivation and enhancement of key product capabilities
Jointly Create a "New Landscape" for Modern Corporate Governance	Employees	• Staff forums • Staff representative assemblies • Democratic informal meeting • Online communication with the General Manager • Corporate Affairs Public Conference	• Protection of legitimate rights and interests • Broad career development opportunities • Effective Vocational Skills Education • Equal Employment Equal Pay • Opportunities to participate in democratic management • Support in adversity • Comfortable and safe working environment
	Community	• Meetings • Seminars • Visits	• Continuous and effective donation • Comprehensively promote rural revitalisation • Carry out public welfare volunteer activities • Energy saving and environmental protection of communication equipment
	Partners	• Seminars • Hotline • Regular visits and interviews with senior management	• Green and eco-friendly operations • Recycling to reduce pollution • Achieve "dual carbon" goals • Recycling materials to reduce waste pollution

Sustainability Management Capability

In 2022, China Unicom continued to strengthen its responsibility capacity and continuously promote the concept of responsibility rooted in the awareness of all employees. The Company established a two-level sustainability team at the Group and branch/subsidiary levels. It extensively and actively promoted the implementation of responsibility practise and encouraged the improvement of the Group's ability to fulfil its responsibilities through case studies, which resulted in many awards from various sectors. The Company also actively participated in various exchange seminars and training in the field of sustainable development, closely monitored the development trend of responsibility, learned from excellent corporate experience and contributed ideas to facilitate the continuous and in-depth development of responsibility.

• China Unicom was accredited with Asia's Best CEO, Asia's Best CFO, Asia's Best CSR, Best Investor Relations Company and Best Investor Relations Professional at the 12th Asian Excellence Awards 2022 held by Corporate Governance Asia.

• China Unicom was voted seven years in a row as "Asia's Most Honoured Telecom Company" by Institutional Investor, and was awarded "Asia's Best ESG (Telecoms)" and "Asia's Best IR Team (Telecoms)".

• China Unicom was accredited with the "Best CEO of Listed Companies", "Best CFO of Listed Companies" and "Best Listed Company in ESG Practises" at the 12th Hong Kong International Finance Forum and China Securities Golden Bauhinia Awards.

• China Unicom was accredited with "ESG Leading Enterprises Awards" in the fourth ESG Leading Enterprise Awards 2022 organised by Chinese Edition of Bloomberg Businessweek and Deloitte.

• China Unicom was accredited with "Platinum Award - Excellence in Environmental, Social, and Governance" in "The Asset ESG Corporate Awards 2022".

• At the "ESG China Forum 2022 Summer Summit", China Unicom won the 8th place in the "Science and Technology Responsibility Pioneer Top 30".

• China Unicom won the "Honour Award - 2022 Outstanding Public Good Practise Award" at the "2022 (5th) Social Responsibility Conference".

APPENDICES

Key Performance

Category	Indicators	Unit	2020	2021	2022
Operations and development	Total assets	RMB billion	580.62	591.08	642.66
	Operating revenue	RMB billion	303.84	327.85	354.94
	Service Revenue	RMB billion	275.81	296.15	319.35
	Profit before income tax	RMB billion	16.03	17.93	20.59
	Total number of "Big Connectivity" subscribers[4]	Thousand	/	/	861,744
	Aggregate number of 5G package subscribers	Thousand	/	/	212,727
	Aggregate number of IoT terminal connections	Thousand	/	/	385,540
	Number of customers served by virtual 5G private networks	Persons	/	/	3805
	Monthly active users of China Unicom APP	Billion households	0.092	0.127	0.131
Network capabilities	Number of 4G base stations	Thousand	1,503	1,560	1,696
	Total number of 5G base station construction	Thousand	380	690	1,000
	4G population coverage	%	94	95	98
	Number of fixed network broadband access ports	Billion	0.225	0.239	0.25
	Broadband coverage rate in administrative villages in ten northern provinces	%	96	98	99
	Gigabit fibre network coverage capacity	Billion households	/	0.108	0.208
	Urban 20M or above broadband network coverage rate	%	96	99	99
	Rural 4M or above broadband network coverage rate	%	100	100	100
	Co-construction rate of pole lines	%	95	95	95
	Sharing rate of pole lines	%	92	93	93
	Co-construction rate of pipelines	%	94	85	91
	Sharing rate of pipelines	%	97	92	93
	International Internet external bandwidth	G	4755	5312	5860
	Number of data centre racks	Thousand	277	312	363
Commitment in major assurance initiatives	Total times of emergency communication assurance	Times	612	695	672
	Emergency communication support personnel	Thousand person-time	660	670	790
	Emergency communication vehicles called out	Thousand vehicle-time	153	155	285
	Emergency communication equipment inputted	Thousand set-time	180	172	186

Category	Indicators	Unit	2020	2021	2022
Independent innovation	R & D investment[5]	RMB billion	11.99	13.23	14.38
	Leading new international standards	Items	23	25	29
	Lead new industry standards	Items	37	38	71
	Number of patent applied	Items	1,734	2,224	2,672
	Number of patents granted	Items	518	1,128	1,666
Customer service	Monthly average complaint rate in the year	Person-time/ million users	11.84	8.75	6.71
	Comprehensive satisfaction rate	Points	81.32	81.68	81.97
	Including: Customer satisfaction of mobile business[6]	Points	80.72	80.62	81.24
	Fixed line phone customer satisfaction	Points	87.7	88.41	88.34
	Fixed broadband subscribers satisfaction rate	Points	80.49	81.84	81.32
People-oriented	Total number of employees	Persons	242121	243380	244,658
	Gender proportion of employees	Male: female	1.54: 1	1.62: 1	1.63: 1
	Proportion of ethnic minority employees	%	6.7	6.8	6.8
	Proportion of female in senior management	%	12.5	12.4	12.8
	Input in employee training	RMB million	364.86	340.99	333.32
	Training hours per employee	Hours	88	94	118
	Network college online learning person-time	Thousand person-times	51000	42000	50040
	Network college per capita learning hours	Hours	2178	2373	2465
	Proportion of contracted employees in labour union	%	100	100	100
	Input to help and support employees suffered from difficulties	RMB thousand	78,800	70,220	81,000
	Input in condolence fund	RMB thousand	42,590	42,100	42,000
	Employee turnover rate	%	1.87	1.69	2.18
	Number of new employees	Persons	10281	12479	13260
	Number of new male employees	Persons	6422	7947	8468
	Number of new female employees	Persons	3859	4532	4792
	Number of employees who voluntarily resign	Persons	4692	3939	3200
	Number of male employees who voluntarily resigned	Persons	2806	2515	2103
	Number of female employees who voluntarily resigned	Persons	1886	1424	1097
	Number of employees dismissed	Persons	1244	1458	2122
	Number of male employees dismissed	Persons	797	927	1369
	Number of female employees dismissed	Persons	447	531	753
	Turnover rate of employees aged below 30	%	7.07	6.23	4.23
	Turnover rate of employees aged 30-50	%	1.18	0.94	0.94
	Turnover rate of employees aged over 50	%	0.13	0.10	0.35
	Turnover rate of male employees	%	1.88	1.67	1.39
	Turnover rate of female employees	%	2.02	1.53	1.18
	Turnover rate of domestic employees	%	/	1.69	1.31
	Turnover rate of oversea employees	%	/	0.58	1.68
	Number of work-related fatalities	Persons	0	0	0
	Rate of work-related fatalities	%	0	0	0

Category	Indicators	Unit	2020	2021	2022
Low-carbon development	Special investment in energy conservation and emission reduction	RMB billion	0.123	0.13	0.168
	Energy saving	Thousand tonnes of standard coal	245	77	269
	Water consumption	Thousand tonnes	14,990	16,980	16,630
	Water consumption density	Tons/RMB Million	47.21	51.65	50.72
	Total energy consumption	Thousand tonnes of standard coal	2,380	2,700	2,890
	Fossil energy consumption	Thousand tonnes of standard coal	100	100	60
	Gasoline consumption[7,9]	Millions of litres	56	37	40
	Diesel consumption[7,9]	Millions of litres	14	20	11
	Natural gas consumption[9]	Thousand m^3	5,420	5,810	4,650
	Coal consumption[9]	Thousand tonnes	23	40	1
	Electricity consumption	Billion KWH	17.22	20.4	22.2
	Energy consumption per unit of information flow	kg standard coal/TB	2.8	3.7	2.4
	Greenhouse gas emission[10]	Million tonnes	14.2	12.97	13.4
	Total direct emission of GHG (category I)	Million tonnes	0.2	0.53	0.14
	Total indirect emission of GHG (category II)	Million tonnes	14.0	12.44	13.22
	Carbon emission intensity	Tons/RMB million	46.6	39.5	40.9
	Sulphur dioxide emission	Thousand tonnes	0.01	0.02	0.002
	Recycling upon scrappage and disposal	RMB billion	0.733	0.456	0.63
	Scrappage and disposal of batteries	RMB billion	0.113	0.122	0.093
	Scrappage and disposal of general materials	RMB billion	0.247	0.334	0.287
Compliance management	Participant attending the compliance training	Thousand persons	243	243	200
	Production safety training sessions	Times	93	119	131
	Production safety training coverage rate	%	100	100	100
Community responsibility	Number of registered volunteers	Persons	55006	57550	89714
	Credit rating[8]	Grade	AAA	AAA	AAA
	Total tax paid	RMB billion	6.59	7.93	7.105
	Employment creation	Persons	10,652	13,038	13349
	Total donations	RMB thousand	6,374	2,082	1,045

Notes:

1. Data Description: The data and information collection of this report mainly sourced from the Company's internal data collection system and relevant statistical reports, as well as the corporate sustainable development practice cases submitted by provincial companies. There is no material change in relation to the methods used for prepping the disclosure. The data for 2022 quoted in this report is the final statistical data. If there is any discrepancy between the financial data and the annual report, the annual report shall prevail. The monetary unit adopted in this report is RMB.
2. Please refer to the Description to the Report for the details of the report reference standards.
3. Quality assurance: The Board of Directors and all directors undertake that the information disclosed in the report is authentic, complete and correct, with no false record or misleading statements.
4. To better reflect the Company's good progress in grasping new opportunities, embracing new changes and achieving new development, the Company has adjusted the disclosure of its monthly operational statistics since March 22, 2022, and improved market transparency in a number of key business areas such as "Ubiquitous Connectivity, Innovative Application, Smart Services and Technological Innovation". Among them, the aggregate number of "Big Connectivity" subscribers = aggregate number of mobile billing subscribers + aggregate number of fixed-line broadband subscribers + aggregate number of fixed-line local access subscribers + aggregate number of Internet-of-things terminal connections + aggregate number of networking leased line subscribers.
5. The original input data of scientific and technological innovation was adjusted to R&D investment according to the statistical caliber required by the superior regulatory authorities since 2021, and the corresponding historical data was updated.
6. According to the regulatory requirements and industry practices of the telecommunications industry, the satisfaction evaluation of mobile phone and mobile internet business was cancelled in 2021, and the satisfaction evaluation of mobile business was newly added. Therefore, the score of mobile business in 2020 was calculated using the average score of the original mobile phone and mobile internet businesses.
7. With reference to the requirements of ESG information disclosure, gasoline and diesel consumption has been measured by volume unit since 2022.
8. The credit rating of China United Network Communications Corporation Limited, a wholly-owned subsidiary of the Company, was granted by United Credit Ratings Co., Ltd. and China Chengxin International Credit Rating Co., Ltd.
9. The data statistics of petrol consumption, diesel consumption, natural gas consumption, electricity consumption and coal consumption cover the headquarters and 31 provincial branches. The conversion factor of each energy consumption shall refer to "General Rules for the Calculation of the Comprehensive Energy Consumption".
10. Statistical methods of greenhouse gas emissions mainly refer to ISO 14064.

Honours and Recognition

- China Unicom ranked 267th in “Fortune Global 500” for the year 2022.
- China Unicom ranked 366th in “The Forbes Global 2000” in 2022.
- China Unicom was rated as the highest level (Grade A) for information disclosure by Shanghai Stock Exchange for five consecutive years.
- China Unicom was awarded the “2022 Best Practise of Board Office of Listed Companies.
- China Unicom was awarded the “Best Investment Value Award” in the Golden Bull Award.
- China Unicom was awarded the “Best in Communications Sector” in the IR Magazine Awards –Greater China 2022.
- China Unicom was awarded first prize of the “2022 Radio Science and Technology Award of China Radio Association”.
- China Unicom won 2 Grand Awards and 6 Gold Awards in the “International ARC Awards 2022”.
- China Unicom was awarded the “Best Annual Report in the Asia Pacific Region” at 2022 LACP Annual Report Awards.
- China Unicom won “General Websites: Telecommunications – Gold” and “Website Features: Best Home page – Gold” in the 2022 “International w3 Awards”.
- China Unicom’s website won the Gold Award of “iNova Awards” for seven consecutive years.
- China Unicom Digital Technology Co., Ltd. was awarded the “2022 Big Data 50”.

Description to the Report

Reporting Period	From 1 January to 31 December 2022, with some contents exceeding the aforesaid period.
Reporting Cycle	China Unicom (Hong Kong) Limited Sustainability Report is an annual report.
Scope of the Report	This report covers China United Network Communications Limited and its subsidiaries. For the convenience of expression, “China Unicom”, “the Group”, “the Company” and “we” are used in the presentation of this report.
Reporting Reference Standard	Guidelines for State-owned Enterprises to Better Fulfil Social Responsibilities issued by the State-owned Assets Supervision and Administration Commission of the State Council; Guidelines for Preparation of Corporate Social Responsibility Report issued by the Shanghai Stock Exchange; HKEX ESG Reporting Guide; Guidelines for Preparation of Social Responsibility Report, AQSIQ and SAC; Chinese Academy of Social Sciences’ Guidelines for the Preparation of Corporate Social Responsibility Reports in China (CASS-CSR 3.0); Chinese Academy of Social Sciences’ Guidelines for the Preparation of Corporate Social Responsibility Reports in China (CASS-ESG 5.0); GRI Sustainability Reporting Standards (latest version) issued by the Global Sustainability Standards Board (GSSB) and the Corporate Social Responsibility Management System of China’s Information and Communication Industry issued by the China Association of Communications Enterprises.
Report Data Description	The 2022 data quoted in this report are final statistical data. In case of any discrepancy between the financial data herein and those in annual report, the annual report shall prevail.
Reporting Quality Assurance	The Board of Directors and all directors undertake that the information disclosed in the report is authentic, complete and correct, with no false record or misleading statement.
Language versions and availability:	The Company’s sustainability report is available in both Chinese and English version in both paper and online formats. The Chinese and English version of the online report is available on the website of China Unicom: http://www.chinaunicom.com.hk.
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Indexes

SEHK ESG Indicators

Index	Page Disclosed	Index	Page Disclosed	Index	Page Disclosed	Index	Page Disclosed
A1	P67-68	A2.5	See note 3	B3	P52	B6.1	N/A
A1.1	P78	A3	P67	B3.1	P52	B6.2	P21
A1.2	P78	A3.1	P68-69	B3.2	P52, 77	B6.3	P32
A1.3	See note 1	A4	P67-68	B4	P50	B6.4	P54
A1.4	See note 1	A4.1	P67-68	B4.1	P50	B6.5	P38
A1.5	P67	B1	P48-51	B4.2	P50	B7	P47-48
A1.6	See note 2	B1.1	P50	B5	P40-44	B7.1	P47
A2	P67-71	B1.2	P77	B5.1	P41-43	B7.2	P47
A2.1	P78	B2	P40	B5.2	P41	B7.3	P47
A2.2	P78	B2.1	P77	B5.3	P41	B8	P61
A2.3	P67	B2.2	P40	B5.4	P68	B8.1	P57-59
A2.4	P69-70	B2.3	P40	B6	P38-40	B8.2	P61

Notes:

1. As China Unicom is a massive entity and its business covers a wide geographical region, currently the Company is not able to produce full statistics over its waste production (including hazardous and non-hazardous categories) as prescribed in A1.3 and A1.4. Upon identification of material topics, we mainly report on the recycling and reuse of main resources utilised by the Company in the course of operation including cables, battery, terminals and comprehensive supplies. The Company will establish related data collection system in the future.
2. As the amount of waste in network operation is directly related to the rapid development of the network and the constant update and iteration of equipment, and the generation and disposal of hazardous waste is not an important aspect of the Group's operation, the waste reduction target involved in A1.6 cannot be disclosed for the time being. We mainly reported on measures such as building a green supply chain and strengthening recycling.
3. As the Company mainly engages in the provision of information communication services, packaging material used for the finished products as prescribed in A2.5 is not applicable to the Company's business practice.
4. Product recycling indicator involved in B6.1 is not applicable to the actual business of the Company. Through the identification of substantive agenda, the Company mainly reported on the maintenance of network information security, the protection of emergency communication, and the protection of customer rights and interests in accordance with the law.

Chinese Academy of Social Sciences CASS-ESG5.0

Index	Page Disclosed	Index	Page Disclosed	Index	Page Disclosed	Index	Page Disclosed
I. Preface of the Report (P series)		P4.4	P6-7	G1.10	P48-49	G3.5	P73
(P1) Specification of the report		P4.5	P10	G1.11	P8	G3.6	P74-75
P1.1	P8 ,48-49	2. Responsibility Governance (G series)		(G2) Governance of the Board		G3.7	P79
P1.2	P79	(G1) Corporate Governance		G2.1	P72	G3.8	P72
P1.3	P83	G1.1	P8, 10, 59	G2.2	P72	G3.9	P75
(P2) Message from senior management		G1.2	P10, 49	G2.3	P72	G3.10	P75
P2.1	P4-5	G1.3	P48-50	G2.4	P72	G3.11	P77
P2.2	P4-5	G1.4	P48	G2.5	P51	3. Environmental Risk Management (E Series)	
(P3) Responsibility focus		G1.5	P66	(G3) ESG Management		(E1) ESG Management	
P3.1	P72	G1.6	P47-48	G3.1	P72	E1.1	P69
(P4) Corporate profile		G1.7	P47-48	G3.2	P72	E1.2	P69
P4.1	P6 ,9 ,79	G1.8	P47	G3.3	P72	E1.3	P70
P4.3	P6-7	G1.9	P48	G3.4	P72	E1.4	P41, 68

Index	Page Disclosed	Index	Page Disclosed	Index	Page Disclosed	Index	Page Disclosed
E1.5	P68	(E4) Safeguarding Ecological Safety		S3.2	P53	V1.2	P55
E1.6	P68	E4.1	P70-71	S3.3	P53	V1.3	P55
E1.7	P69	E4.2	P70-71	S3.4	P40	V1.4	P55
E1.8	P68-71	E4.3	P70-71	S3.5	P40	(V2) Industry Value	
E1.9	P67	(E5) Responding to Climate Change		S3.6	P40	V2.1	P31
(E2) Use of Resources		E5.1	P67	S3.7	P22-23	V2.2	P32-33
E2.1	P67	E5.2	P69	S3.8	P40	V2.3	P16
E2.2	P68	E5.3	P69	S3.9	P40, 78	V2.4	P16
E2.3	P78	E5.4	P69	S3.10	P40	V2.5	P41
E2.4	P68-69	E5.5	P80	S3.11	P77	V2.6	P42
E2.5	P68-69	E5.6	P80	S3.12	P40	V2.7	P33
E2.6	P68	E5.7	P80	(S4) Responsibility to customers		V2.8	P42
E2.7	N/A	4. Social Risk Management (S Series)		S4.1	P54	(V3) People's livelihood value	
E2.8	N/A	(S1) Employment		S4.2	P54	V3.1	P50
E2.9	P69-70	S1.1	P50	S4.3	P54	V3.2	P78
E2.10	P78	S1.2	P50	S4.4	P55	V3.3	P19-22
E2.11	P78	S1.3	P50	S4.5	P55	V3.4	P57-60
E2.12	P78	S1.4	P50	S4.6	P38	V3.5	P57
E2.13	P69	S1.5	P77	S4.7	P77	V3.6	P78
E2.14	P69	S1.6	P51	S4.8	P57	V3.7	P58
E2.15	P69	S1.7	P51	S4.9	P39	(V4) Environmental Value	
(E3) Emissions		S1.8	P51	(S5) Responsible supply chain management		V4.1	P67
E3.1	N/A	S1.9	P51	S5.1	P41	V4.2	P67
E3.2	N/A	S1.10	P53	S5.2	P41	V4.3	P67-71
E3.3	N/A	S1.11	P51	S5.3	P41	V4.4	P67-71
E3.4	N/A	(S2) Development and Training		S5.4	P41	V4.5	P67-71
E3.5	P69	S2.1	P52	S5.5	P41	6. Report appendix (A series)	
E3.6	P69	S2.2	P52	S5.6	P41	(A1)	P76-78
E3.7	P69	S2.3	P52	S5.7	P41	(A2)	P74
E3.8	P69	S2.4	P52, 77	5. Value Creation (V Series)		(A3)	P75, 79
E3.9	P69	(S3) Occupational health and safety production		(V1) Country Value		(A4)	P80-82
E3.10	P69	S3.1	P53	V1.1	P55	(A5)	P83

Notes:

1. As the Company mainly engages in the provision of telecommunication services, packaging for finished products and discharge of waste water and waste gas as prescribed in E2.7-2.8, E3.1-3.4 are not applicable to the Company's business practice.

GRI Sustainability Reporting Standards

No.	Page Disclosed
GRI2: General Disclosure	
1. Organisation and Reporting Practises	
2-1	P6
2-2	P9
2-3	P79, 83
2-4	P79, 83
2-5	/
2. Activities and workers	
2-6	P41-43
2-7	P50, 77
2-8	P52
3. Governance	
2-9	P9-10, 72
2-10	P49, 78
2-11	P9-10, 72
2-12	P72
2-13	P72
2-14	P72
2-15	P20-21
2-16	P74-75
2-17	P72
2-18	P49
2-19	P51
2-20	P51
2-21	See annual report
4. Strategy, policies and practises	
2-22	P72
2-23	P78
2-24	P72
2-25	P42, 66
2-26	P51
2-27	P67
2-28	P32-33, 37
5. Participation by stakeholders	
2-29	P40-44, 74-75
2-30	P51, 77
GRI3: Material Topics	
3-1	P73-74
3-2	P73-74
3-3	P4-75
GRI201: Economic benefits	
3-3	P12-16
201-1	P76
201-2	P68
201-3	P51, 66
201-4	See annual report
GRI203: Indirect Economic Impacts	
3-3	P18-23
203-1	P18-23
203-2	P18-23
GRI 204 Procurement Practises	
3-3	P41
204-1	P66
GRI205: Anti-corruption	
3-3	P47
205-1	P47
205-2	P47
205-3	P48
GRI302: Energy	
3-3	P67-68
302-1	P78
302-2	P78
302-3	P78
302-4	P78
302-5	P68-69, 78
GRI305: Emissions	
3-3	P67-68
305-1	P78
305-2	P78
305-3	P78
305-4	P78
305-5	P78
305-6	N/A
305-7	N/A
GRI307: Environmental Compliance	
3-3	P67-68
307-1	P67
GRI308: Supplier environmental assessment	
3-3	P41
308-1	P68
308-2	P68
GRI401: Employment	
3-3	P50-51
401-1	P77
401-2	P51
401-3	P51
GRI402: Labour Relations	
3-3	P50-51
402-1	P50-51
GRI404: Training and education	
3-3	P52
404-1	P52
404-2	P52
404-3	P52, 77
GRI405: Diversity and equal opportunity	
3-3	P49-50
405-1	P50, 77
405-2	P51
GRI406: Anti-discrimination	
3-3	P50
406-1	P50
GRI413: Local communities	
3-3	P66
413-1	P66
413-2	P68
GRI414: Supplier assessment for impacts on society	
3-3	P41
414-1	P41
414-2	P41
GRI416: Customer health and safety	
3-3	P48
416-1	P48
416-2	P48
GRI417: Marketing and labeling	
3-3	P48
417-1	P68
417-2	P48
417-3	P48
GRI418: Customer privacy	
3-3	P38-39
418-1	P38-39

Notes:

1. Material gases such as ozone-depleting substances (ODS), nitrogen oxides (NOX) and sulphur oxides (SOX) cited in 305-6 and 305-7 are not the major emissions of the Company.

Feedback

Dear Reader,

Thank you for reading China Unicom's 2022 Sustainability Report, which is the seventh sustainability report published by the Company to the public. In order to better provide you and other stakeholders with valuable information while facilitating the supervision of social responsibility works as well as enhancing the capability and standard of performing social responsibility, we would like to have your valuable opinions and suggestions regarding this report.

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Your capacity:

A. Customer B. Shareholder C. Government D. Community E. Business partner F. Media G. Social organization H. Others (please specify) _____

Overall evaluation of China Unicom's Sustainability Report:

A. Excellent B. Good C. Fair D. Not Satisfactory E. Poor

Evaluation of China Unicom's performance in economic, social and environmental responsibilities:

Economic responsibility	A. Excellent	B. Good	C. Fair	D. Not Satisfactory	E. Poor
Social responsibility	A. Excellent	B. Good	C. Fair	D. Not Satisfactory	E. Poor
Environmental responsibility	A. Excellent	B. Good	C. Fair	D. Not Satisfactory	E. Poor

Response and disclosure in this report in connection with the concerns of stakeholders?

A. Excellent B. Good C. Fair D. Not Satisfactory E. Poor

Overall evaluation of this report in terms of the clarity, accuracy and integrity of the disclosure of information, data and index:

Clarity	A. Excellent	B. Good	C. Fair	D. Not Satisfactory	E. Poor
Accuracy	A. Excellent	B. Good	C. Fair	D. Not Satisfactory	E. Poor
Integrity	A. Excellent	B. Good	C. Fair	D. Not Satisfactory	E. Poor

Readability of this report in terms of content arrangement and layout design?

Content Arrangement	A. Excellent	C. Fair	E. Poor
Layout Design	A. Excellent	C. Fair	E. Poor

Any other opinion/suggestion for our work and report of sustainability?

_____

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Thank you for your feedback and precious time.

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