



GREEN DEVELOPMENT

In December 2023, the 28th United Nations Climate Change Conference (COP29) reached consensus on the first global stocktake of the Paris Agreement, marking a new chapter in the global climate process and having important milestones significance. In response to the global trend of green and low-carbon transformation, China Telecom adheres to the concept of green development and actively responds to climate change by accelerating the digital uplift of energy efficiency and management capabilities, optimizing the dual transition of energy structure and product portfolio, and promoting green carbon operation while empowering green development of the whole industry.



PRACTICING “DUAL CARBON” STRATEGY

The Company thoroughly implements the national “dual carbon” strategic goals, and actively implements the *Opinions on Completely, Accurately, and Comprehensively Implementing the New Development Concept and Achieving Carbon Dioxide Peaking and Carbon Neutrality* (《關於完整準確全面貫徹新發展理念做好碳達峰碳中和工作的意見》), the *Action Plan for Carbon Dioxide Peaking by 2030* (《2030年前碳達峰行動方案》), *Opinions on Promoting the Gradual Shift from Dual Control of Energy Consumption to Dual Control of Carbon Emissions* (《關於推動能耗雙控逐步轉向碳排放雙控的意見》) and the objectives of policy documents under the “1+N” series issued by relevant ministries of the nation. Under the guidance of the “1248” dual carbon action plan, the Company integrated green and low-carbon into the whole process of corporate production and operation.



Governance structure

The Company promotes the implementation of green and low-carbon strategy under the guidance of the “Carbon Dioxide Peaking and Carbon Neutrality” leadership group, which is led by the Chief Executive Officer, who is responsible for overseeing the group's daily activities. The Company has set up a three-level governance structure comprising decision-making level, management level and implementation level.

Governance level	Accountable department	Composition and main responsibilities
Decision-making level	"Carbon Dioxide Peaking and Carbon Neutrality" leadership group	Establish a carbon neutrality management system to promote the implementation of the "1248" dual-carbon action plan, taking a leadership role in green development, as well as making decisions on important matters
Management level	Green Development Taskforce	Focus on green and low-carbon transformation, formulate key tasks for green development, promote the implementation of green development, and integrate green and low carbon into various production and operation activities
Implementation level	The departments responsible for energy-saving and emissions-reduction and related business departments of each subordinate unit	Track climate change-related risks and opportunities in real-time, and provide recommendations to management and decision-making levels based on practical experience

Under the guidance of the "1248" dual-carbon action plan, the Company has continuously optimised the 28 key tasks of green development and incorporated the key tasks into the key work of various departments. It formulated the *China Telecom Implementation Rules for Carbon Dioxide Peaking and Carbon Neutrality for 2023* (《中國電信2023年「碳達峰、碳中和」工作實施細則》), including the key work of green development into the appraisal system of provincial branches and professional companies. We have constantly improved the management structure and department responsibilities of the green development to jointly promote carbon dioxide peaking and carbon neutrality through the horizontal department coordination and vertical "headquarters-province-city" cooperation.

Achievements and goals

In 2023, the Company achieved favourable results in energy conservation and carbon reduction. Through multi-pronged measures such as co-building and co-sharing, green renovation of facility rooms, and AI energy saving, we reduced greenhouse gas emissions by more than 13 million tons this year, the comprehensive energy consumption per unit of total volume of telecommunications services decreased by 14.9% year on year, and the greenhouse gas emissions per unit of total volume of telecommunications services decreased by 19.6% year on year. Since 2021, the Company has reduced its greenhouse gas emissions by more than 30 million tons through co-building and co-sharing and various energy-saving measures, completing ahead of schedule the emissions reduction target of 27 million tons set for the 14th Five-year Plan period. The Company promises to continue to reduce comprehensive energy consumption intensity and greenhouse gas emissions intensity in 2024.

Climate risk management

The Company proactively responds to climate change by integrating climate-related risk management into its risk management, enabling a closed-loop management process for risk identification, risk assessment, analysis of key risks, risk response and risk monitoring and tracking. We evaluate the impact of different risk categories on financial and operational development and propose corresponding measures.

Climate change-related risks faced by China Telecom and its corresponding response measures

Type of risks	Risk description	Major financial impacts	Time frame	Degree of impact	Response measures
Policy and regulation risk	- At present, Beijing branch, Shanghai branch and Shenzhen branch have been included in the regional carbon trading market and are required to comply with the rules and regulations of the local carbon trading market. China Telecom's datacentre has a high probability of being included in the national carbon trading market in the future and will be required to comply with the national carbon trading rules and regulations. - The national greenhouse gas voluntary emissions reduction trading market was launched this year. If the carbon emissions of Beijing, Shanghai, Shenzhen and other places exceed the quota, they may need to purchase China Certified Emission Reduction (CCER) and be exposed to additional compliance costs. - The national policy requires that the proportion of green electricity in new datacentres in the national hub nodes of "East-to-West Computing Resource Transfer" exceed 80%, and the minimum proportion of renewable energy used in green datacentres in government procurements to reach 5% (for year 2023). China Telecom may face mandatory requirements for the use of renewable energy in future, which may incur additional operating costs.	Higher operating costs	Long-term	Medium	- Regularly track and analyse relevant policies and regulations, evaluate the extent of China Telecom's compliance with policies and regulations on a monthly basis, study the impact of emerging policies on China Telecom, and alert related risks. - Organise and carry out carbon stocktake and carbon verification in 31 provinces to obtain the full picture the carbon status and assess potential performance risks. - Conduct renewable energy surveys to assess the feasibility and cost of renewable energy access.

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Type of risks	Risk description	Major financial impacts	Time frame	Degree of impact	Response measures
Technology risks	With the development of the information and communication industry, the demand for computing power has grown explosively, and the energy consumption of datacentres, base stations, and communication facility rooms has accelerated. If energy-saving technologies with higher efficiency and lower energy consumption are unavailable or not applied, the cost of energy consumption may soar.	Higher operating costs	Short-term	Medium	- Conduct an annual financial impact assessment of energy consumption costs and select appropriate energy-saving and carbon-reduction technologies. - Strengthen the independent research and development, conversion and promotion of energy-saving and carbon-reduction technologies, and promote large-scale application. - Carry out green renovation of old facility rooms and retirement of old equipment.
Acute risks	Extreme weather such as flooding and typhoon may damage our infrastructure and fixed assets, causing network disruption, communication interruptions and resulting in additional operating costs such as asset damage losses, repair fees from communication interruptions and operating cost for resuming communication. In the future, as the severity and frequency of extreme weather increases, the Company's capital expenditure may also increase further.	Higher capital expenditures	Medium-term	High	- Strengthen alert and risk prevention and control of extreme weather, continuously optimise emergency plans for extreme weather, and minimise the cost and losses from disasters. - Regularly assess the impact on capital expenditures based on the frequency and scale of extreme weather, and set up special funds for post-disaster reconstruction on this basis.
Chronic risks	Global warming results in higher temperature. As our communication facility rooms, base stations, datacentres and other equipment require reasonable temperature range for steady operation, rising temperature may accelerate aging of the equipment, increase electricity consumption of air conditioning and cause direct increase of operating cost and capital expenditures.	Higher capital expenditures/operating costs	Long-term	Medium	Regularly analyse and monitor energy consumption-related indicators and provide risk alerts.

PROMOTING LOW-CARBON OPERATION

Under the guidance of the “1248” dual-carbon action plan, the Company has been promoting green cloud-network, green energy use, green office, recycling, green sci-tech innovation and green management and constantly tapping its own carbon reduction potential.

Green cloud-network

The Company continues to promote green upgrade of datacentres. We have released the technology solution for new generation artificial intelligence datacentre (AIDC) infrastructure that is compatible with multiple business models by adopting three key technologies, namely energy elasticity, cooling elasticity and airflow optimisation based on customers' demand for computing power, to meet the uncertain needs stemming from greatly varied cabinet power, mixed cooling modes, and customer flow in the era of intelligent computing, and create a new generation of AIDC characterised by flexibility, elasticity and greenness.

We have continued to promote AI energy saving and developed proprietary smart AI energy saving systems to achieve precise energy saving for 4/5G base stations, communication facility rooms and datacentres. The AI facility room energy saving system has been deployed and implemented in 25 provinces, with annualised electricity saving of 83 million kWh. The AI base station energy saving platform has been deployed and promoted in 31 provinces, with annualised electricity saving of more than 700 million kWh. Through the deployment of smart AI energy saving system, greenhouse gas emissions reduced by more than 440,000 tons annually.



【China Telecom • Zero Carbon Qinghai】

The Company continues to promote the construction of “China Telecom • Zero Carbon Qinghai”, and commits to achieve carbon-neutral operation of Qinghai (branch) by 2024 and net zero emissions in the supply chain of Qinghai (branch) by 2040 by: (1) building the first 100% traceable clean energy zero-carbon datacentre in China, realising 314 days of natural cooling annually, with PUE below 1.2 and annual carbon reduction of more than 300,000 tons; (2) building the first “e-Surfing Forest” of China Telecom, with a total area of 2,000 mu, actively exploring the development path of forestry carbon sink; (3) building more than 500 “zero-carbon base stations”, realising self-reliance of the wind-solar complementary power supply system, with annual electricity output of 4 million kWh and annual carbon emissions reduction of 2,300 tons.

“China Telecom • Zero Carbon Qinghai” has won awards such as the Excellent Case in Research Report on ESG of Listed Central SOEs, Excellent Green and Low-carbon Practice Case, and “Leading Technology Achievement Award” of the 2023 Big Data Expo.

We have comprehensively deepened co-building and co-sharing cooperation, reduced duplicate construction of 4/5G base stations and significantly enhanced the utilisation rate of existing base stations, while protecting the natural environment and landscape, and reducing the consumption of land, energy and raw materials. Meanwhile, the Company continued to deepen co-building and co-sharing of infrastructure such as pole lines, pipelines, and optical cables. Over 220,000 5G base stations were newly activated for the two parties. The number of 5G co-shared base stations in use exceeded 1.21 million and the number of 4G mid-band co-shared base stations reached more than 2 million. The Company provided more than 8,100 kilometres of co-shared pole line and 580 kilometres of co-shared pipelines. 4/5G co-building and co-sharing has led to over RMB340 billion savings in network construction investment, over RMB39 billion in annualised operating cost savings, and over 20 billion kWh in annual electricity savings for the two companies. At the same time, the Company continued to promote the construction and deployment of ROADM all-fibre network, new metropolitan network with comprehensive carrying capacity, Gigabit fibre network and ultra-low loss optical cable network and minimalist base station transformation.

In response to concerns in telecommunications engineering construction from the government and the public, such as farmland protection, equipment pollution, construction impact and electromagnetic radiation, the Company has established a sound electromagnetic radiation management system and risk prevention mechanism, taken various proactive environmental protection measures such as environmental assessment, and communicated with the public actively.



【Coordinated network development by actively carrying out full monitoring of the electromagnetic environment in the 4/5G network】

The Company actively carries out 4/5G multi-band network electromagnetic environment monitoring, to continuously improve the quality of electromagnetic ecological environment. The picture shows an on-site inspection by an expert group on the electromagnetic radiation monitoring of base stations in November 2023.

Green energy use

The Company continues to promote the transformation and optimisation of energy use structure, and the utilisation of green energy has been significantly increased. We continuously expand green power transactions, and effectively promote the cross-provincial and cross-regional consumption of resources from regions with rich new energy through cross-provincial transactions. The consumption volume of green electricity with "integration of trading of permit and electricity" exceeded 1.1 billion kWh, representing a year-on-year increase of nearly three times, which was industry-leading in PRC. We have further expanded the coverage of self-built distributed energy facilities, covering multiple scenes including base stations, communication facility rooms, datacentres, office buildings and parking sheds, and the power generation scale was three times than that of 2022.



【Construction of distributed photovoltaic at Kunshan Huaqiao Datacentre】

The Kunshan Huaqiao Datacentre of the Company in Jiangsu Province has four floors. The distributed photovoltaic construction occupies a total area of 980 square metres, with a total installed capacity of 107.91 kW, providing power for the facility room of the datacentre. Its annual electricity generation is 108,000 kWh with annual electricity cost savings of RMB76,000 and carbon emissions reduction of approximately 61.6 tons.



【“zero-carbon” base station construction】

In order to ensure the communication needs of herdsmen and tourists, Altay branch has completed the light-stacking construction of base stations in 14 summer pastures in the region, and powered base stations with photovoltaic energy to achieve flexible peak-trough scheduling of electricity consumption in the pastures. The successful construction of the “zero carbon” base stations effectively reduced the operating cost of base stations. The project saved electricity of 147,700 kWh annually, while saving electricity cost by about RMB59,000 and reducing the carbon emissions by about 84.23 tons.

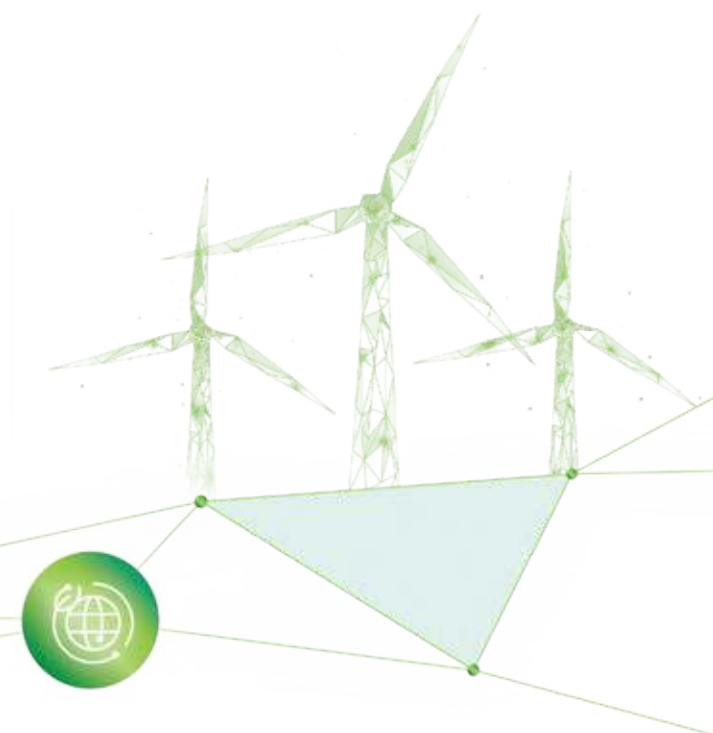
Green office

The Company actively promotes and advocates water conservation by posting reminders regarding water conservation near water facilities and appliances. The Company continuously strengthens the management on water resources usage, carries out sewage discharge and treatment, promotes the reuse of water in production, actively uses reclaimed water as an alternative source of water in place of tap water while meeting the demands for water-usage. The Company promotes and popularises the use of water-saving appliances and performs regular checks and repairs on each part of the water supply system to prevent water leakage and wastage. The Company sets the target for year-on-year growth of water consumption per unit operating revenue for 2024 to be no more than 15%.

The Company encourages paper saving by actively advocating double-sided printing of documents, reducing colour printing, accelerating the digital transformation of the procurement supply chain and vigorously promoting the application of electronic procurement and electronic order to realise paperless operation of the whole process of the supply chain. We also continuously promote electronic accounting files management, VAT electronic invoice, e-reimbursement and filing of e-invoice and paperless operation, and promote automatic process of tax declaration in order to reduce paper usage.

Recycling

The Company prioritises the use of resource-saving and environmentally friendly products, and actively builds a sustainable supply chain. We seriously implement the *Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste*, the *Management Measures for Hazardous Waste Transfer* and other national laws and regulations and standards, focusing on safe and compliant disposal requirements. Through system construction, digital construction, supervision and inspection, we continue to promote the building of green packaging and idle and waste materials disposal systems.





【Leading low-carbon and win-win of the industrial chain and supply chain through green packaging】

The Company established a "1-5-1" green packaging low-carbon management system that guides our suppliers to perform green low-carbon obligations, so as to improve supplier behaviour and green packaging process, which to a certain extent, solves the problem of resource waste and environmental pollution caused by the excessive packaging in the entire industrial chain. The system won the second prize at the first "New Green Cup (新绿杯)" Information and Communication Industry Enabled Carbon Dioxide Peaking and Carbon Neutrality Innovation Competition.

We continuously improve the construction of management systems for the disposal of idle and waste materials. We have revised relevant systems for the recycling, disposal and external transfers of waste and idle materials, which involved developing standard auction contract templates and risk identification checklists and specifying the requirements for the confirmation of recycling, disposal assessments, contract signing and contract fulfillment of waste and idle materials, etc., to ensure that the whole operation process is regulated by clear rules. We continuously strengthen the construction of digital capability of idle and waste materials disposal and completed the development and launch of the integrated platform for waste and idle materials disposal to achieve online closed-loop management of the whole process from asset retirement, material inventory withdrawal, auction disposal, contract signing and delivery. Based on the inspection points and risk control list, we continue to conduct supervision and inspection on idle and waste materials disposal nationwide to check and promote compliance improvement.



【Building a Compliant and Efficient Digital Intelligent Recycling Ecosystem for Idle and Waste Materials Disposal】

"Building a Compliant and Efficient Digital Intelligent Recycling Ecosystem for Idle and Waste Materials Disposal" released by the Company won the first prize at the first "New Green Cup (新绿杯)" Information and Communication Industry Enabled Carbon Dioxide Peaking and Carbon Neutrality Innovation Competition. China Telecom has built a "1 core mechanism + 1 system platform + N disposal stages" idle and waste materials disposal management system, giving full play to the advantages of its role of "chain leader" in the supply chain, and established a digital and intelligent cycling ecological alliance for idle and waste materials disposal to promote intensive and efficient disposal and perform its dual-carbon mission and social responsibility, and achieve win-win social and economic benefits.

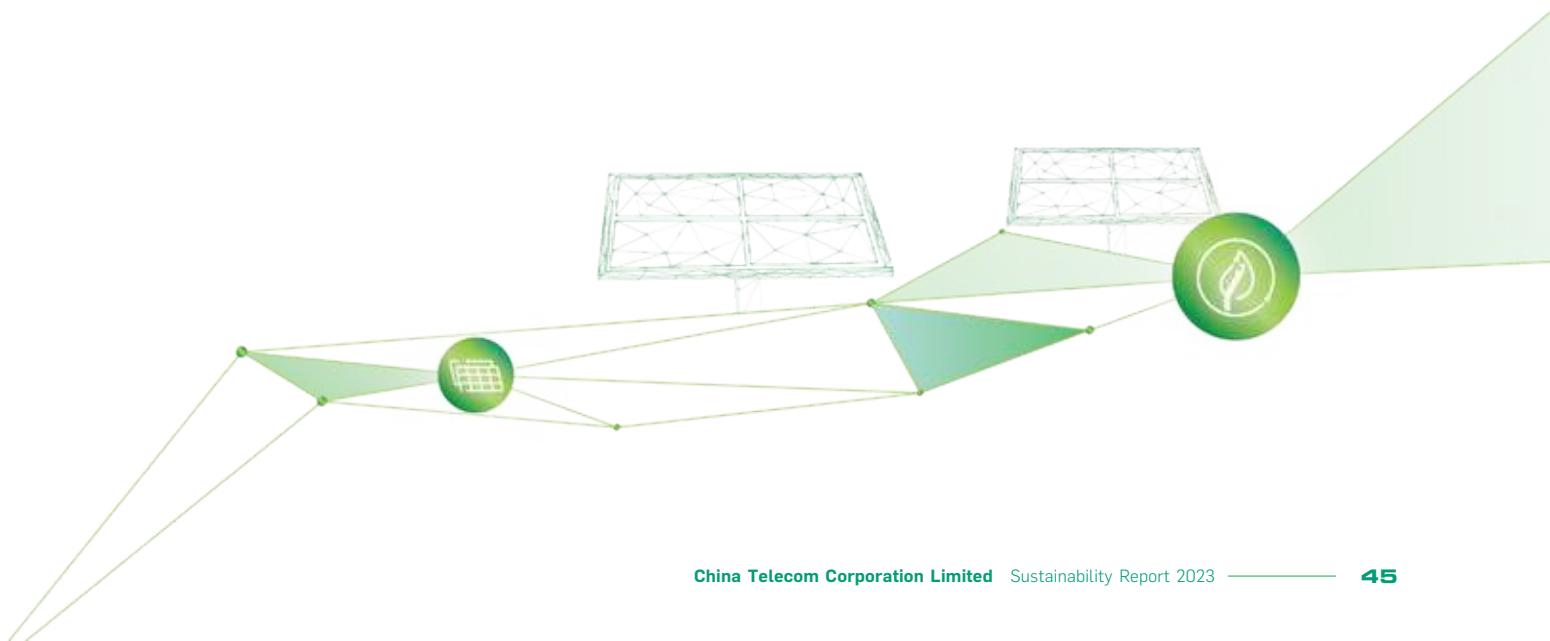
In 2024, the Company will continue to strengthen the professional management of waste, adhere to the principle of "recycling as much as possible", promote the launch of the idle and waste materials integrated disposal platform nationwide, used cables and storage batteries auction and disposal, and enhance compliance management of environmental protection, so as to increase disposal income and promote green and low-carbon recycling development.

Green sci-tech innovation

The Company accelerates the breakthrough and conversion of green technologies by vigorously promoting the innovation and development of green and low-carbon technologies, and has developed a series of proprietary green and low-carbon products such as e Secure Energy, e Energy Saving, e Extreme Cooling and 5G Integrated Smart Power Supply Cabinet. We have established and optimised a green and low-carbon standard system, and participated the setting of 29 international, industry and enterprise standards in areas of dual carbon. We have promoted cooperation in the whole chain of "industry, academia, research and application", established a provincial- and ministerial-level carbon neutral system engineering laboratory in collaboration with Beijing Institute of Technology, and set up a green zero carbon innovation experimental base in Qinghai.

Green management

The Company continues to improve its green management level, upgrades means for dual-carbon information management, and innovates the dual-carbon management model. We have started the pilot work of internal carbon trading to marketise the trading mechanism and tap into the carbon reduction potential and effectively reduce the carbon emissions intensity. We have improved the carbon emissions data management and governance capabilities of each province by establishing a standardised process of carbon inventory and carbon verification to form a normalised mechanism to effectively enhance the quality of carbon data. We have cultivated experts for dual-carbon management and carbon verification, accumulated experience from carbon market trading to improve the level of carbon asset management.



EMPOWERING GREEN DEVELOPMENT

The Company accelerates the improvement of green products and service system by injecting green elements into products and services through the green transformation of cloud-network infrastructure, which promotes the formation of green and low-carbon lifestyle and leads green consumption.



【Release of six major green products】

On 12 July 2023, the 11th "National Low-carbon Day", the Company held the "The Launch of China Telecom Cloud Green Storage Base and China Telecom Green Products" event in Xining, Qinghai province. We took the application of new energy saving and carbon reduction technology as an important driving force and empowered the innovative dual-carbon development of information and communication through green product innovation system. The Company released six major green products, i.e., green cloud drive, green cloud computer, zero-carbon datacentre, zero-carbon cloud, green consumption credits, and green public service. Moreover, China Telecom and its key partners entered into an ecological cooperation agreement on the green industrial chain.



【Launching a green credit system for carbon reduction behaviours】

Hebei branch actively advocates innovation of users' green consumption model by launching a series of green consumption scenes such as utility payment, mobile phone package top up, offline consumption, online shopping and fund transfer, and improves users' sense of gain from green consumption through green credits on Bestpay. By the end of 2023, a total of 128,000 users had received 287,000 times of "Green Energy" and accumulated 34.1 million green credits, and achieved emissions reduction of 24,565kg CO₂e (carbon dioxide equivalent).

We firmly establish and practise the concept that clear waters and green mountains are sources of income, and make full use of the advantages of digital technology in ecological protection, pollution prevention and control, energy conservation and carbon reduction, contributing to greenhouse gas emissions reduction of the society by over 100 million tons.

We actively promote ecosystem protection and build an ecological protection monitoring and management system focusing on biodiversity, migratory birds monitoring, and forest and grass protection, to provide effective support for scientific management and sustainable development of ecosystem protection.



【Video monitoring at Lanzhou Swan Beach, "clairvoyant eye" for migratory birds protection】

Lanzhou branch supports the local unit-in-charge in vigorously promoting digital, informatised and intelligent construction of wintering migratory birds and wetland protection, and builds a "space, aerial and ground" integrated monitoring system adopting 5G, IoT and other technologies to provide more scientific basis for ecological protection.



【Building 5G Marine Ranch】

Sanya branch built a 5G marine ranch project with Wuzhizhou Island and a marine ranch information platform relying on 5G network and information technologies including IoT, Big Data, cloud computing and AI to achieve all-round, precise and real-time monitoring of regional marine status as well as reef and biological conditions, enrich comprehensive assessment, online diagnosis, trend analysis, disaster alert, production volume assessment and other application scenes, so as to ensure measurable, visual and controllable marine pasture management and help protect and improve the ecological environment of the sea area around the scenic spot.

We actively promote the prevention and control of air pollution, formulate air quality prediction and early alert models and build an environmental protection cloud platform, to realise intelligent quality monitoring of atmospheric environment, early warning, command and dispatch. We have helped Gansu, Hebei and other provinces to greatly enhance air pollution prevention and control levels, providing a strong assurance for winning the war protecting the blue sky.



【Environmental protection cloud platform to support air pollution prevention and control in Hebei Province】

Through the construction of environmental protection cloud platform, the Company realises command and coordination of atmospheric pollution prevention and control at provincial, municipal and county levels. Tens of thousands of scheduling tasks were handled every day with 100% accuracy of task handling and over 95% of efficiency enhancement, which saved manpower and financial resources by above 80% as well as expert service labour cost of RMB144 million per year. This effectively supported refined control of the atmospheric environment, providing strong guarantee for the war protecting the blue sky. The environmental protection cloud platform has won many accolades from the Ministry of Industry and Information Technology and Hebei Province.

We actively promote energy saving and carbon reduction. For shopping malls, schools, office buildings, hospitals and other public places, we make integrated use of IoT, AI, cloud computing and other capabilities, to achieve precise measurement of water, electricity, gas and heat, and energy saving control of lighting, air conditioning and other facilities, to effectively reduce the energy consumption of public buildings. Through environmental protection publicity and education activities, we enhance the public awareness of environmental protection and low-carbon to form a green and low-carbon lifestyle.



【Enabling Daqing City to make a green and low-carbon transformation】

The IoT Company provided green and energy saving upgrading services for underground parking lot lighting system of 23 units including Daqing Municipal People's Government, Daqing Municipal People's Procuratorate, Government Offices Service Centre and properties under Urban Investment Group (城投集團). After the energy saving upgrading, the overall electricity consumption was reduced by 80%, saving 630,000 kWh of electricity per year.

In 2023, the Company's green development empowerment has achieved significant results. At the first "New Green Cup (新綠杯)" Information and Communication Industry Empowered Carbon Dioxide Peaking and Carbon Neutrality Innovation Competition hosted by China Academy of Information and Communications Technology (CAICT) and under the guidance of the Ministry of Industry and Information Technology, the Company won 4 first prizes, 8 second prizes and the "Best Organisation Award", ranking first in the industry. The Company was recognised as a global leader in climate action by CDP (Carbon Disclosure Project) for the first time.