

WHITE PAPER | 2024

# ZTE Net-Zero Strategy



# Acknowledgement

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Wang Xiang, Chief Strategy Officer of ZTE Corporation

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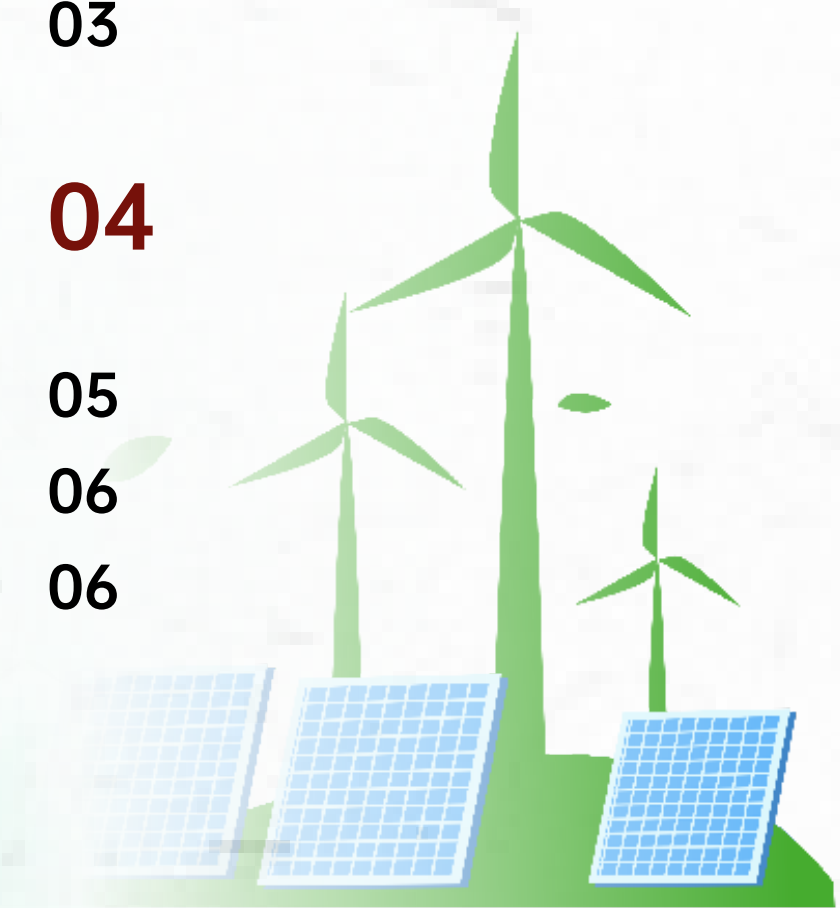
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## Message from the Chairman

Extreme climate events are occurring frequently, exerting growing negative impacts on the global community. This highlights the urgency of addressing climate challenges, which is critical to the future of humanity. Under the framework of the Paris Agreement, countries are taking proactive actions to reduce greenhouse gas emissions and mitigate global temperature rise. China has announced its goals of peaking carbon emissions by 2030 and reaching carbon neutrality by 2060, which are known as the "dual carbon" goals. In accordance with national policies, efforts across regions and industries are being channeled towards a shared goal of eco-friendly, low-carbon, and high-quality development.

**Enterprises play a pivotal role in achieving the dual carbon goals.** As a leading player in the telecommunications industry, ZTE highly values and actively implements the principle of green development. With a deep understanding of our responsibility, we have outlined net-zero vision and the "Green Digital Path" strategy. This strategy focuses on reducing emissions in ZTE's operations and value chain, enhancing the energy efficiency of products and solutions through technological innovation, and empowering industries to achieve digital transformation and low-carbon growth with green ICT infrastructure. The company has formulated ambitious emission reduction objectives along with specific action plans. In April 2024, ZTE's science-based carbon reduction targets, set according to the Science Based Targets initiative (SBTi) guidelines, were approved by the SBTi and listed on the SBTi's target dashboard.

With a mindset of global citizenship, ZTE has been committed to practicing the **"Green Digital Path" strategy**. We have launched a company-wide dual-carbon campaign and implemented extensive emission reduction measures in all departments and business activities, covering each stage of the carbon cycle. In the initial phase of the dual-carbon campaign spanning from 2021 to 2023, ZTE achieved encouraging results—a **16.5% reduction in total carbon emissions and inclusion in the CDP Climate Change A List for our leading climate actions**. Additionally, we have established a range of best practices and methodologies that will create a positive, long-lasting impact.

This white paper conveys ZTE's vision for a net-zero future and shares our experiences in **green business operations, green supply chains, green digital infrastructure, and green empowerment of industries** across the globe. It showcases numerous low-carbon technologies and innovative use cases. By publishing this white paper, we seek to share best practices and better engage and collaborate with industry partners and the broader community to jointly advance the global net-zero agenda.

Looking forward, we will devote our efforts to further emission reduction, enhance the application of and R&D investment in low-carbon technologies, and promote innovation and industrial transformation. Joining hands with global partners, we aim to build a green, low-carbon industry chain while delivering intelligent ICT products that are more efficient and eco-friendly.

ZTE will continue to actively engage in international exchanges and cooperation, contributing more Chinese wisdom and solutions to the cause of sustainable development for humanity.



Li Zixue, Chairman of ZTE Corporation

# 01

## Foreword

Green, low-carbon, and sustainable development has become a global consensus in this era. The telecommunications industry plays a crucial role in this endeavor, emerging as a leading force in driving society's low-carbon transition.

## Green and Low-Carbon Mission for Society and Industry

### Global Community and China

According to the *Climate Change 2023 Synthesis Report* from the United Nations Intergovernmental Panel on Climate Change (IPCC), greenhouse gas emissions since the advent of industrialization have impacted weather and climates in every region worldwide, resulting in widespread losses and damages to both ecosystems and humanity. The potential consequences are severe, including extreme and volatile weather patterns, declining agricultural productivity, rising sea levels, and the extinction of species. Without intervention, climate change threatens to undo many years of development and could spark large-scale migrations, leading to instability and conflict.

On December 12, 2015, nearly 200 countries signed the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC), agreeing to strengthen global efforts against climate change. The agreement set a goal to hold the increase in global average temperature to well below 2°C above pre-industrial levels by the end of this century, pursuing efforts to keep the increase below 1.5°C.

To address climate change, nations and industries must undertake extensive and decisive actions. Sectors such as energy, industry, transportation, agriculture, and forestry are striving to reduce their consumption of and dependence on fossil fuels and minimize greenhouse gas emissions. One objective of the Paris Agreement is to reach global peaking of greenhouse gas emissions as soon as possible and achieve carbon neutrality or net-zero emissions in the latter half of this century.

On September 22, 2020, China made a significant pledge to peak carbon emissions by 2030 and achieve carbon neutrality by 2060, which is known as the "Dual Carbon" goals. As China is the world's largest developing country, this initiative is not only critical for the country's sustainable development but also has a positive impact on the global efforts to combat climate change and achieve carbon neutrality. Over the past three years, various sectors and regions in China have been diligently working towards the dual carbon goals, creating synergies for cutting carbon emissions, reducing pollution, expanding green development, and stimulating economic growth. The dual carbon initiative has seen a good start with positive outcomes.

### ICT Industry

According to the research from the Global e-Sustainability Initiative (GeSI), the ICT industry's carbon emissions accounted for approximately 2.3% of worldwide emissions in 2020. The GSMA projects that by 2030, the ICT sector's carbon emissions will still only represent 1.97% of global emissions, which remains relatively low compared with other economic sectors such as steel, power, and transportation.

However, the accelerated pace of digital transformation is driving up energy demand and carbon emissions within the ICT industry, particularly with the rapid development of data centers and 5G mobile networks, which has increasingly captured public attention. Some studies predict that by 2035, the combined electricity consumption of data centers and 5G networks in China could be 2.5 to 3 times that in 2020, potentially accounting for 5% to 7% of the country's total electricity usage. As China seeks to meet its carbon peaking and carbon neutrality goals, the ICT industry must not overlook its own emissions. There is an urgent call for the sector to pursue green and low-carbon strategies, ensuring the coordinated development of digital economy and the energy conservation and emission reduction initiatives.

On the other hand, ICT products and services play a crucial role in enabling green development across various sectors, significantly enhancing efficiency and resource utilization in social activities. The ICT industry can drive a tenfold or even greater positive impact on reducing carbon emissions, positioning itself as a key enabler in carbon peaking and carbon neutrality.

As a result, the green and low-carbon development of the ICT industry and its role in empowering other sectors are receiving increasing attention. International industry organizations such as the ITU and GSMA have established various emission reduction goals, pathways, guidelines, and standards. In China, the Ministry of Industry and Information Technology and industry associations have issued several guiding documents, including a plan for the green development of industrial sectors, five-year plans for the information and communication industry, and *Action Plan for Green and Low-Carbon Development of the Information and Communication Industry*. At the same time, leading ICT companies, both globally and within China, are actively setting examples and establishing themselves as pioneers in the societal transition toward low-carbon development.

# 02

## ZTE's Current Status and Response to Carbon Emissions

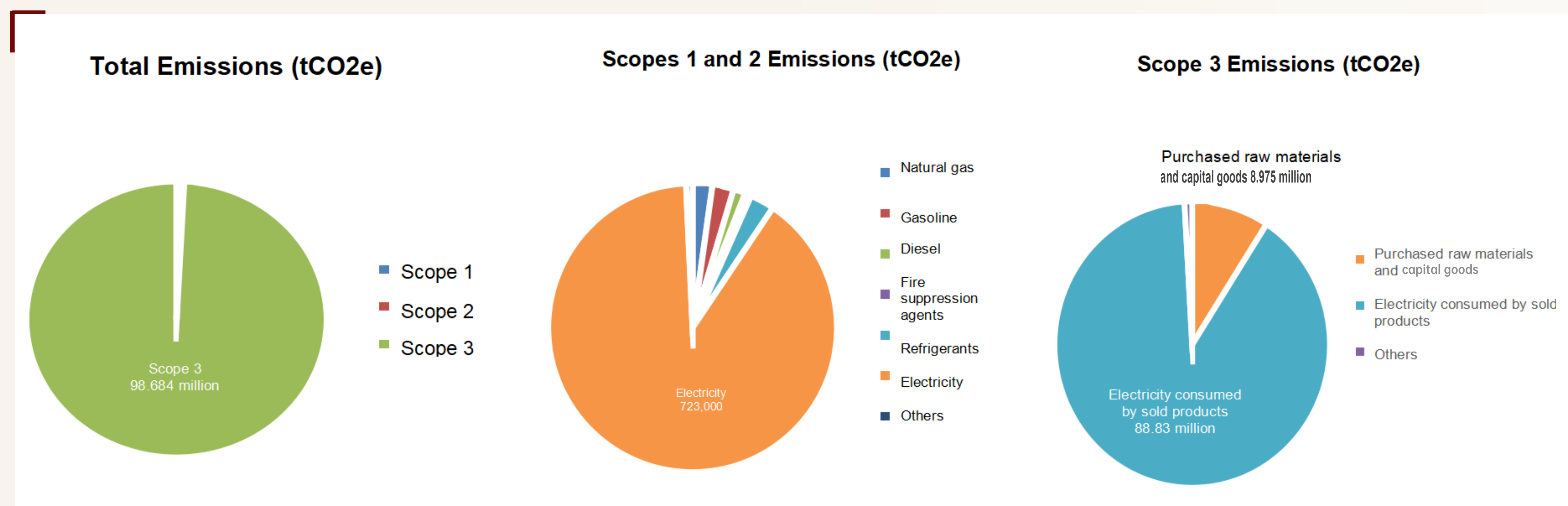
As a global leading provider of integrated information and communication technology solutions, ZTE is committed to becoming a "Driver of Digital Economy". While ZTE's direct operational emissions are relatively low, we remain devoted to leveraging digital innovation to promote energy conservation, emission reductions, and the green, low-carbon transition across society.



## Baseline and Characteristics of ZTE's Net-Zero Journey

Prior to 2021, ZTE's greenhouse gas emissions were on an upward trend, driven by the continuous growth of the company's revenue and the enhanced capabilities of products such as 5G equipment and high-performance servers. This trend signaled the need for the company to implement a more systematic and comprehensive emission reduction strategy to achieve green and sustainable development.

In 2021, ZTE began to conduct a comprehensive carbon audit covering all its global branches by following the ISO 14064-2018 standard. That year, the total carbon emissions across Scopes 1, 2, and 3 amounted to 99.49 million tons of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e), with an emission intensity of 869 tCO<sub>2</sub>e per million CNY in revenue.



ZTE's emission distribution pattern reflects the typical characteristics of a high-end ICT manufacturing enterprise. Scopes 1 and 2 emissions from the company's operations are relatively low, accounting for about 1% of the total emissions, with the majority being Scope 2 emissions resulting from electricity consumption. The vast majority of emissions, approximately 99%, are Scope 3 emissions, originating from the upstream and downstream of the value chain. The most significant contributors are emissions from the electricity consumed by sold products (nearly 90%) and emissions from purchased raw materials and capital goods (around 9%). This distribution indicates that ZTE must not only focus on reducing emissions from its own operations but also collaborate closely with upstream and downstream partners to collectively reduce emissions across the value chain.





## Driving Forces Behind ZTE's Green and Low-Carbon Initiative

### 01 Social responsibility

As significant contributors to carbon emissions, enterprises are duty-bound to lead efforts in energy conservation and emission reduction. Larger enterprises, in particular, should set an example in combating climate change.

### 02 Innovation in technology and business

The green and low-carbon transition is closely linked with the deployment of new technologies and innovation, creating opportunities to improve operations, upgrade products, and promote investments.



### 03 Brand reputation

Enterprises with strong ESG performance are more likely to earn the trust of investors and consumers. Carbon emission reduction is a key environmental factor in ESG evaluations.

### 04 Value chain influence

Customers increasingly prefer low-carbon products and services, and enterprises are feeling the pressure from the value chain to reduce emissions.

## ZTE's Commitment to Net-Zero Strategy and Green Development Path

In 2022, ZTE updated its environmental policy, reaffirming its commitment to green development worldwide and embedding environmental protection principles throughout its entire product lifecycle. At the same time, ZTE views environmental protection as a responsibility shared by all employees, partners, and stakeholders. To that end, the company is dedicated to achieving a comprehensive green and low-carbon transition, advancing toward its net-zero emissions goal, and taking the lead in environmental protection within the industry.



# 03

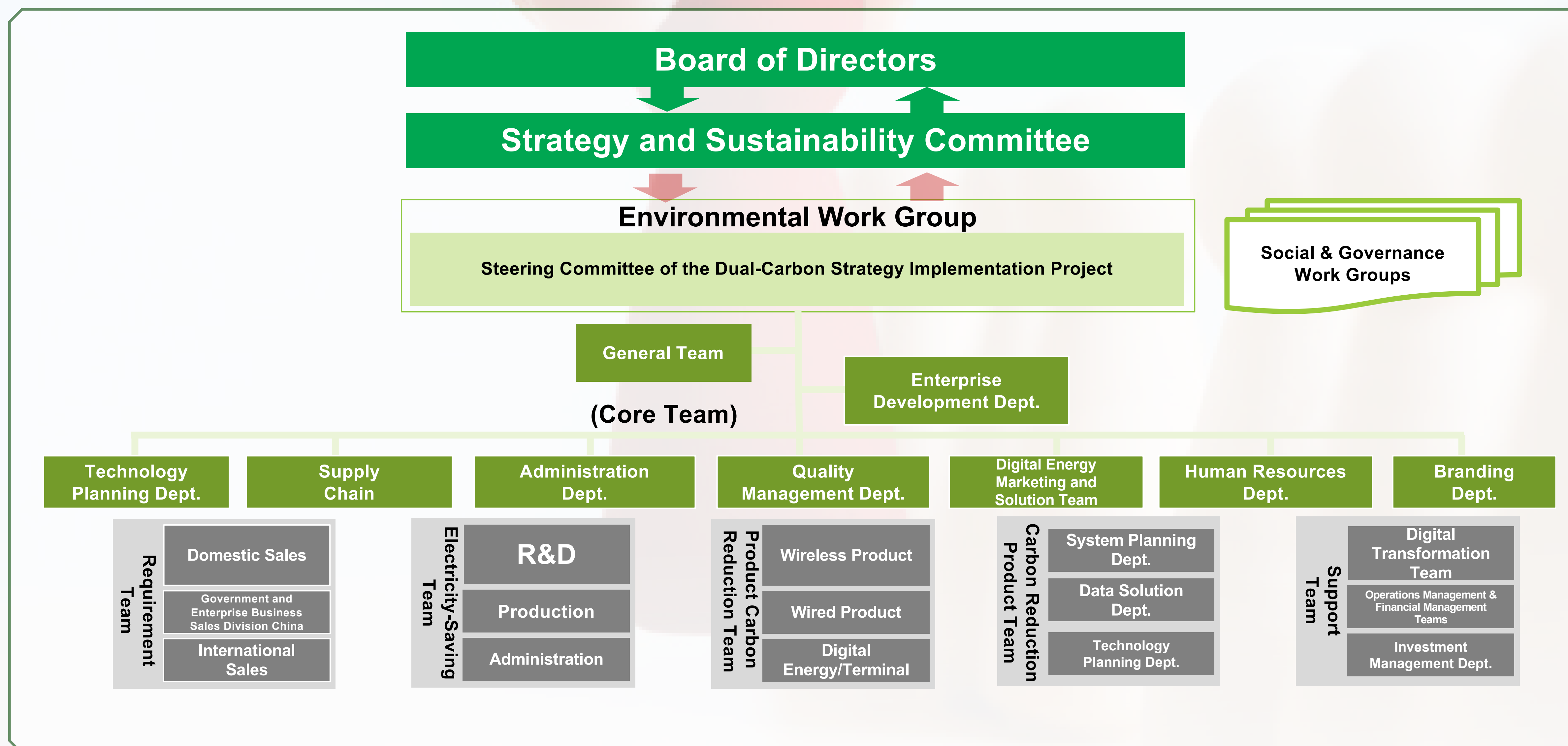
## Management Commitment

ZTE deeply understands and fully acknowledges the profound societal significance of reducing greenhouse gas emissions, and takes proactive actions to respond to the international carbon reduction trends and China's dual carbon goals. ZTE's management has made a public commitment to executing a net-zero strategy, which is backed by a range of measures, including the establishment of an integrated organizational structure led by ZTE's Board of Directors, efficient and effective resource allocation, compliance with high standards domestically and internationally, and active fulfillment of governance and disclosure obligations. With these efforts, the company firmly executes and integrates the net-zero strategy into its long-term development plans and strategic objectives. In line with the strategy, internally, ZTE promotes continuous improvement; externally, it empowers the industry to save energy, reduce carbon emissions, and drive "new quality productive forces," aiming to become a global leading company that advances green, sustainable development with low-carbon technology.



## Organizational Structure and Resource Allocation

Sustainable development directly reflects a company's contributions to the environment and society, as well as the effectiveness of its internal governance. It is a complex and systematic undertaking that involves all aspects of the company. To achieve sustainable development, ZTE has established a comprehensive organizational structure that covers the Environmental (E), Social (S), and Governance (G) aspects of sustainability. Currently, the Environmental work group focuses on planning and implementing the zero-carbon strategy.



The Board of Directors deliberates and approves the company's annual sustainable development strategies, major projects, and related work plans.

**Strategy and Sustainability Committee:** The Committee is composed of the senior management members of the company, including the Executive Vice Presidents, Chief Operating Officer, and Chief Strategy Officer. The Committee implements the ESG-related decisions made by the Board of Directors on sustainable development, evaluates major projects and their results, guards the company against relevant risks, and reports work progress to the Board of Directors on a regular basis.

ZTE has a well-established dual-carbon structure with strong organizational capabilities. In early 2022, the company launched a corporate-level program for dual-carbon strategy implementation, led by a steering committee comprised of the CSO, COO, CFO, CHO, and other senior executives. The program, spearheaded by the Enterprise Development Dept., has brought together over 250 members from various departments, including R&D, production, marketing, supply chain, administration, operations management, and human resources. This team provides crucial organizational support for advancing and implementing the company's dual-carbon strategy.

## Fulfilling Governance Disclosure Obligations

As a company listed on both the Hong Kong and Shenzhen stock exchanges, ZTE adheres strictly to the stock exchange guidelines, as well as the Global Reporting Initiative (GRI) Standards and the United Nations' 2030 Sustainable Development Goals (SDGs). ZTE integrates the principles of sustainable development throughout its operations and governance, with "green and low-carbon" as one of the core elements of the company's sustainability strategy. The company has consistently disclosed its green emission reduction targets, emissions data, and annual progress in its sustainability reports, and participated in the CDP Full Corporate Questionnaire, continuously enhancing the completeness and compliance of its carbon information disclosures.

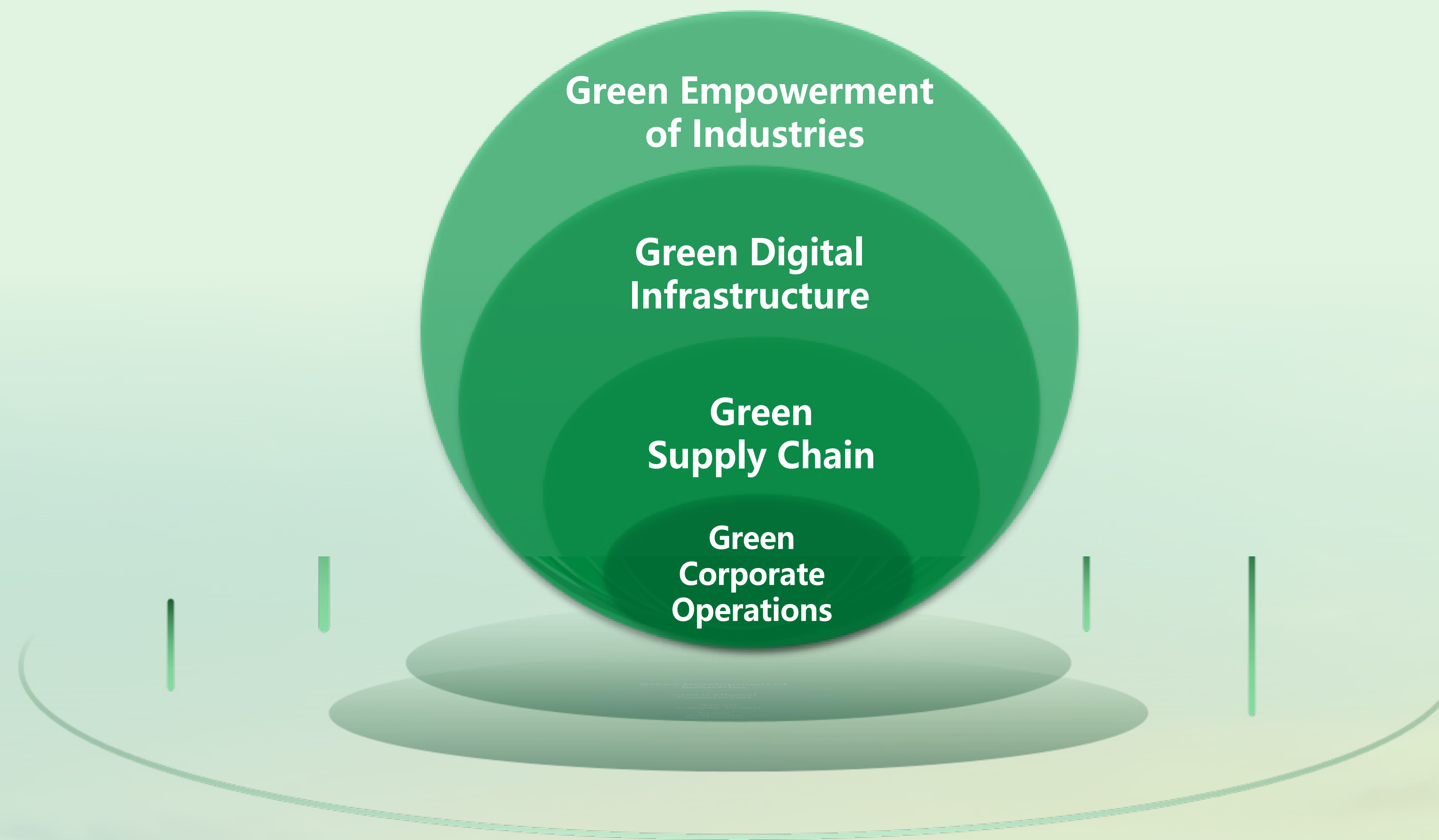


# 04

## Net-Zero Strategy

In this new era, ZTE remains committed to its role as a "Driver of Digital Economy," with "green and low-carbon" as one of the core elements of the company's sustainability strategy. Leveraging 5G, big data, cloud computing, AI, and other digital technologies, ZTE continues to advance innovation across four key areas: green corporate operations, green supply chain, green digital infrastructure, and green empowerment of industries. Through these efforts, the company is charting a "Green Digital Path," not only fostering internal growth but also empowering industries to improve energy efficiency and reduce carbon emissions, contributing to the achievement of "dual-carbon goals" worldwide.

## "Green Digital Path" Strategy



### 01 Green Corporate Operations

ZTE advocates "practicing all-around low-carbon operation with technology changes as the main focus." With an emphasis on high energy-consuming facilities such as R&D laboratories, production lines, and central air conditioning systems, the company implements a series of management and technological measures for energy conservation and carbon reduction to minimize resource consumption and environmental impact. ZTE also aims to expand the use of self-built new energy systems that enable the integration of solar PV modules and energy storage, which have been widely applied in the company's campuses in different cities across China.

### 02 Green Supply Chain

The company actively collaborates with partners to build a green supply chain and establish a carbon reduction collaboration mechanism. Green and low-carbon requirements are embedded throughout the supplier management process, promoting coordinated emission reduction across the supply chain. Through the internal and external circulation processes, the company continues to improve capabilities in the 3R's (Reduce, Reuse, and Recycle) and advance full-lifecycle material management to achieve green regeneration.

### 03 Green Digital Infrastructure

ZTE focuses on improving product energy efficiency, endeavoring to build an end-to-end zero-carbon network. The company provides end-to-end solutions that span energy generation, utilization, and storage, with the goal of achieving "clean energy, advanced ICT, and intelligent networks." By managing the entire lifecycle from material and component selection to product design and development, manufacturing and assembly, and recycling, ZTE constantly strengthens its "super simple, innovative, precise, and beneficial" ICT infrastructure and AI-driven autonomous networks with innovations in low-carbon technologies.

### 04 Green Empowerment of Industries

ZTE has been committed to enabling energy conservation, carbon reduction, and quality and efficiency improvement across industries. The company has launched a green and precise cloud and network solution based on the ZTE Digital Nebula. With this solution, the company explored over a hundred 5G innovative applications across 15 major industries in collaboration with different partners, contributing to the digital transformation as well as energy conservation and emission reduction of various industries.

## Short-Term and Long-Term Carbon Reduction Targets

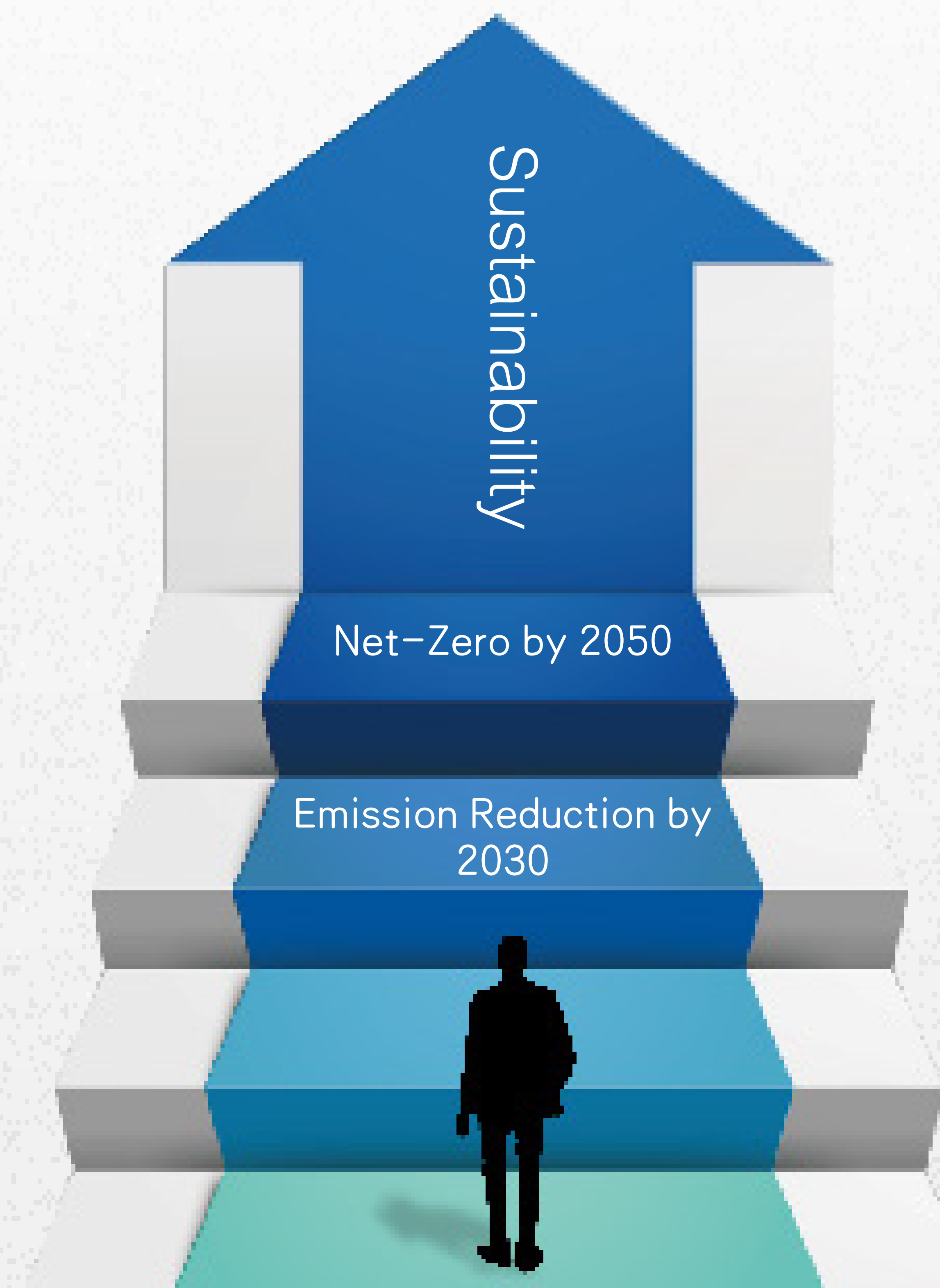
The Science Based Targets initiative (SBTi) encourages businesses worldwide to reduce carbon emissions and address climate change by setting emissions reduction targets aligned with the temperature goals set in the Paris Agreement, attracting widespread participation from leading companies across various industries. In May 2023, ZTE submitted the SBTi Commitment Letter, and in September of the same year, the company set and officially submitted the ambitious emission reduction targets based on SBTi's criteria. In April 2024, ZTE became the first large ICT company in China to receive official approval from the SBTi for the 1.5°C and net-zero targets. Additionally, the company was recognized with the 2023 Climate Leadership Award (A list), marking a significant step on its journey of combating global climate change.

### Net-Zero by 2050:

- 1) Reduce total emissions, including those from operations and the value chain, by 90% from 2021 levels.
- 2) Offset or remove any residual emissions that cannot be eliminated.

### Emission Reduction by 2030:

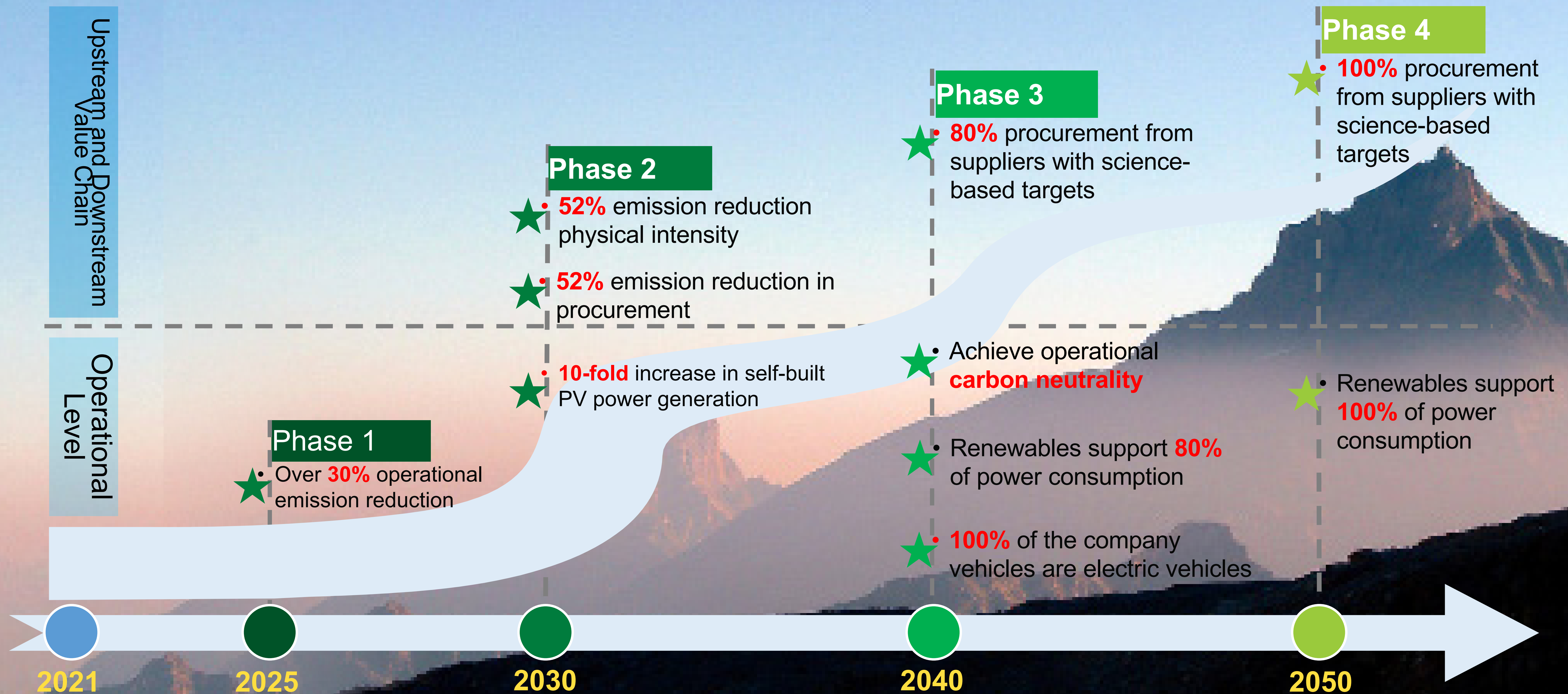
- 1) Scopes 1 and 2 (operational emissions): Reduce operational emissions by 52% by 2030, with 2021 being the base year.
- 2) Scope 3 (value chain emissions): Reduce carbon emissions per unit of product performance by 52% by 2030 (measured by physical intensity), while ensuring no increase in the total emissions.



## ZTE Dual-Carbon Roadmap

To ensure the achievement of our short-term science-based targets and long-term net-zero emission target, ZTE has fully decoded strategies, and established a series of implementation plans, targets for different fields, and milestones in different phases.

- 1) Carbon neutrality goal: Achieve operational carbon neutrality by 2040.
- 2) Targets for different fields in four phases.





# 05

## Action Plan and Practice

To facilitate cross-departmental and cross-team collaboration and carry out emission reduction activities in a unified manner, ZTE has developed full-cycle carbon emission reduction methodology based on its own features, to translate strategies into structural and success-oriented actions.



## Overview

### Full-Cycle Carbon Emission Reduction Methodology

ZTE implements emission reduction measures throughout the entire carbon emission lifecycle to realize closed-loop management, thus fully achieving the long-term net-zero goal. Those measures can be divided into four types: behavior change, energy transition, energy efficiency improvement, and carbon offsetting and removal. Based on these measures, ZTE seeks specific solutions to reduce all emissions in the value chain.

#### Behavior Change: Less Demand

e.g. Cut office space, walking to work

#### Energy Efficiency Improvement: Lower Consumption

e.g. Liquid-cooling technology, transport optimization

#### Energy Transition: Lower Emissions

e.g. Rooftop PV, mobile hydrogen generation station

#### Carbon Offsetting and Removal: Less Residual Emissions

e.g. Products with precharged carbon credits



At the early stage, ZTE mainly focuses on behavior changes and energy efficiency improvement, which can be controlled and quickly implemented. With more advanced technologies, lower costs, and better market and policy environments regarding renewable energy, ZTE will gradually shift to energy transition measures. The achievement of the long-term net-zero target relies more on carbon offsetting and removal, which are still under exploration. ZTE will continue to keep up with the development of related technologies and industries, and actively seize opportunities to implement carbon offsetting and removal.

## Success-Oriented Actions

There are four key principles for the emission reduction of the entire company and its departments.

Principles	Guided by standards	Based on management regulations	Driven by technological innovation	Supported by collaboration
Meaning	Advanced concepts, standardized actions, science-based systems, unified language, and convenient benchmarking.	Solid, clear, effective, replicable, and sustainable in the long term.	As the major driver of emission reduction, technological innovations should be greatly improved.	United efforts for multi-dimensional emission reduction by all units.

## Structural Actions

Based on the full-cycle carbon emission reduction methodology, all departments have identified and developed specific emission reduction measures according to their emission patterns, so as to build a green path to digital economy. Now, ZTE has implemented dozens of emission reduction measures.

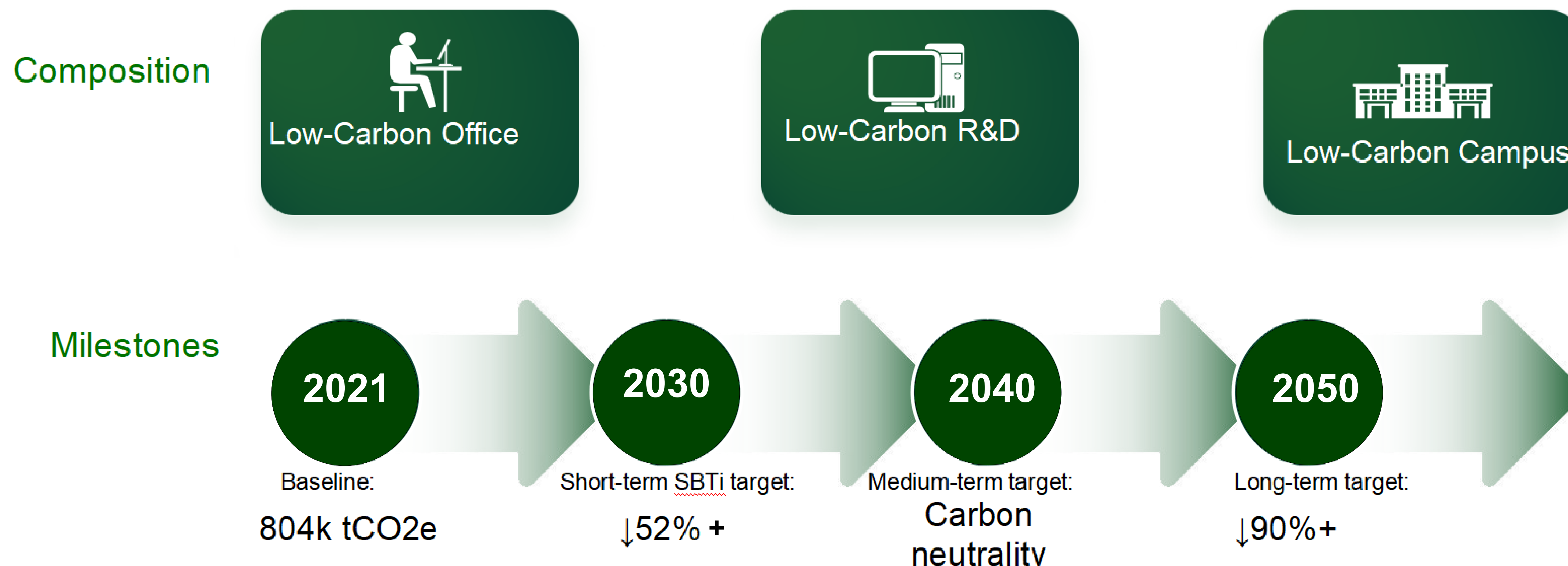


## Structural Actions



## Green Operations

ZTE reduces operational emissions of its business premises through green operations. These emissions mainly refer to the Scope 1 and Scope 2 emissions defined in the GHGP standards.



### Low-Carbon Office

ZTE advocates a corporate culture of low-carbon office, and strives to reduce the emissions of office working through cultural guidance, rules and standards, and productivity tools. The core of building low-carbon offices is to reshape or replace traditional work models with digital technologies, so as to minimize energy consumption, idle facilities, mobility of people and things, material consumption, and waste generation. ZTE has always been implementing key measures such as promoting Cloud-Officing, paperless office, space management, and green commuting, and exploring new technologies, scenarios, and models for emission reduction.

## Cloud-Officing

ZTE has built and operated flexible, intelligent, green, and low-carbon cloud data centers based on its full-stack in-house solutions (IDCs, Server and Storage Products (SSPs), cloud foundation, cloud desktops, and cloud printing), significantly decreasing the CAPEX and OPEX. By fully promoting cloud desktops, we saved more than 40,000 terminals. Meanwhile, employees can enjoy safer office infrastructure with lower energy consumption through green data centers. Compared with the year of 2021, the energy consumption of office equipment such as computers and servers greatly declined in 2023, resulting in a total emission reduction of 220,000 tons, as more employees started to work in the cloud. Moreover, ZTE has been developing a unified App for the next-generation natural language interaction to reduce costs and build an ultimate AI company.

### Cloud-Based Scheduling

10% less servers    9% higher utilization rate

- 1) Visual resource management    2) Cloud-based centralized resource management    3) Resource sharing and scheduling

### Centralized Construction

70% less purchased equipment  
70% lower cost

- 1) Centralized resource management  
2) Centralized construction of resource pools  
3) Centralized construction of equipment rooms



### Energy Conservation

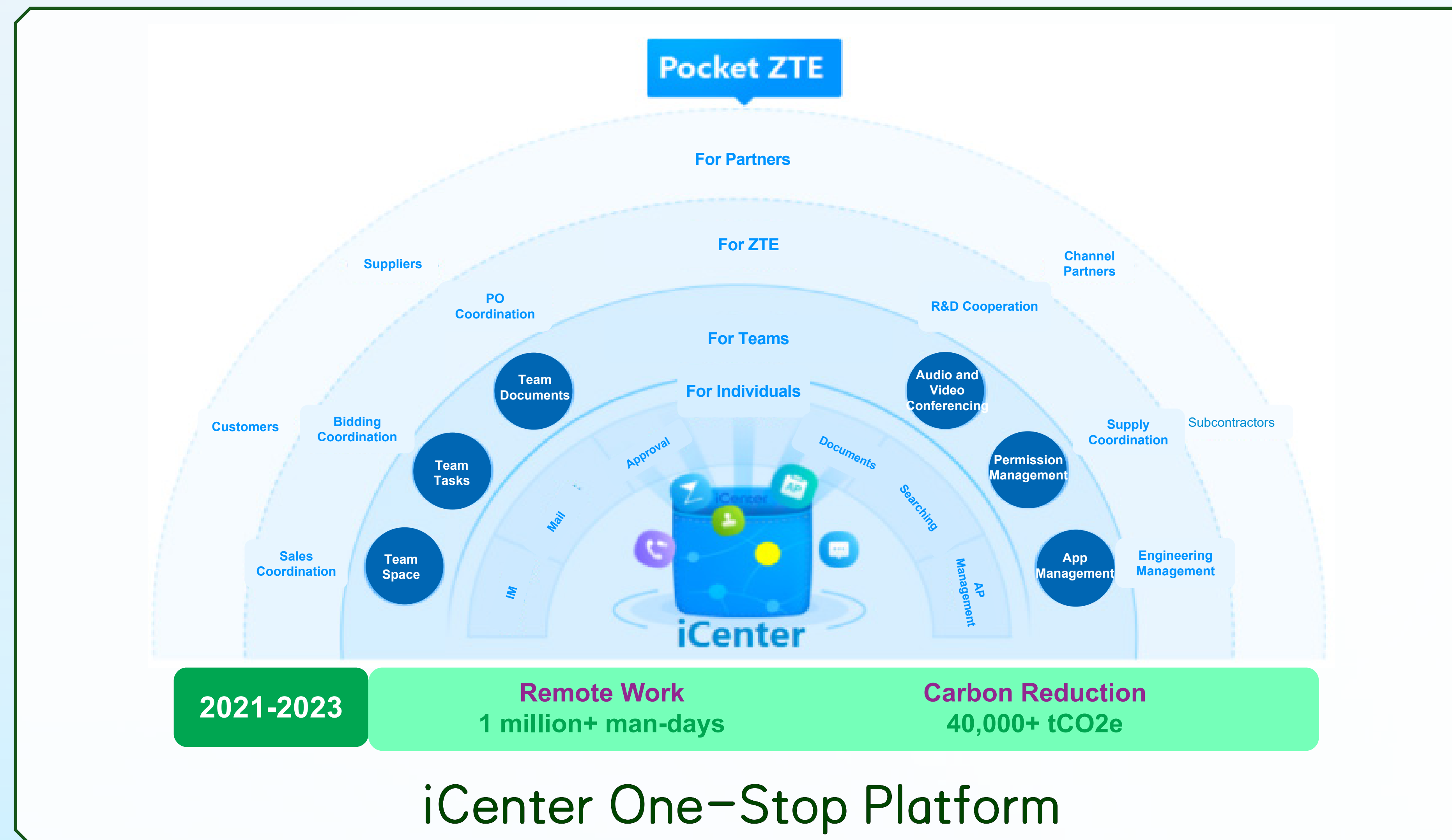
Saved tens of millions of kWh  
12% lower energy consumption

- 1) Visualized energy management  
2) Energy conservation of equipment rooms  
3) Energy conservation of servers

ZXCLOUD

Standard Equipment Room

iCenter, a one-stop collaboration platform developed by ZTE, connects people, knowledge, business, and devices. It supports employees' interaction with each other online, reducing the offline flow of personnel and items. With applications such as cloud desktops, messaging, spaces, and audio and video conferencing, iCenter can support routine remote work, replacing traditional modes that require offline meetings and business trips, which can cause high carbon footprints. In 2023, ZTE reduced 670,000 tons of carbon emissions with less air and rail travels. Moreover, iCenter was among the first to pass CAICT's certification on digital services of smart office.







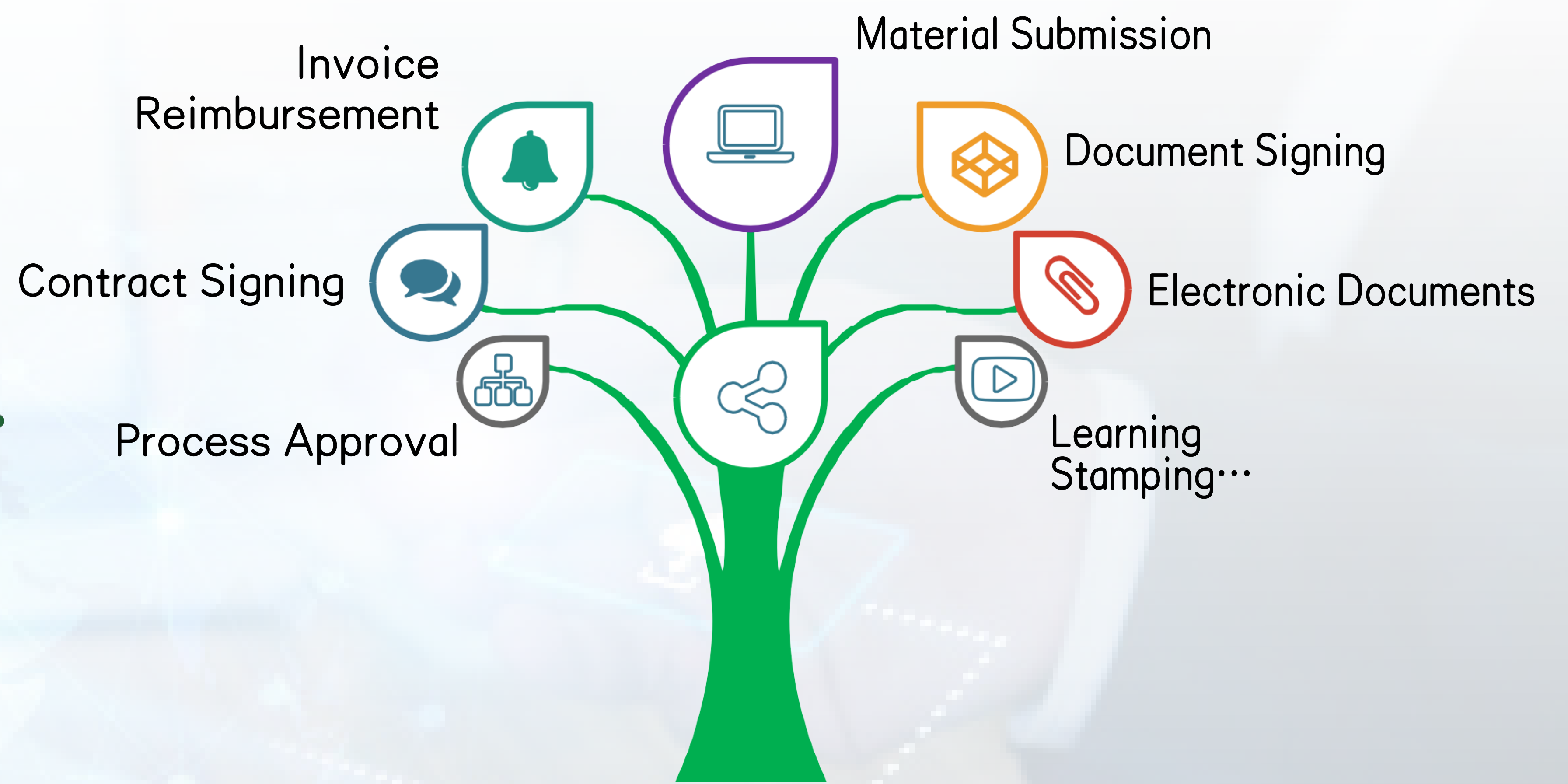
## Paperless Office

Transforming from offline to intelligent online, ZTE identifies the scenarios of offline information flow, and controls it with the integrated document control and printing system and online scenario tools, reducing emissions caused by paper consumption and personnel movement.

In daily work, convenient and easy-to-use digital and intelligent tools are provided to employees for high-frequency scenarios, including notifications and announcements, material submissions, electronic documents, document signing, process approval, contract signing, invoice reimbursement, learning, examinations, and stamping. These tools can not only improve employee satisfaction, but also effectively reduce paper use.



- 
**High Cost**  
 Cost of paper and printer maintenance
- 
**High Emission**  
 Follow the green and low-carbon development initiatives
- 
**Long Time**  
 Manually printing, signing, and scanning are time-consuming.
- 
**High Complexity**  
 Booking, ticket collection, and invoice reimbursement.



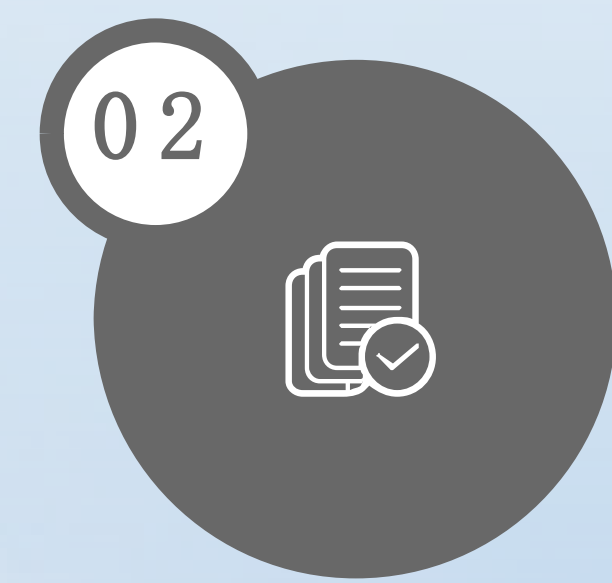
## Space Management

The construction and operations of office space cause carbon emissions. The larger space we build, the higher emission we generate. ZTE first reduces unnecessary space through precise management. For example, without affecting employee comfort during work and rest, the company has increased the space utilization rate by changing the layout of office furniture. 6% of L-shaped desks were replaced by straight desks, which saved about 15% of space per workstation.

In addition, ZTE has adopted an innovative space management approach, integrating space and meeting management systems to realize online management of spaces, buildings, workstations, and meeting rooms in 21 campuses in China. Meanwhile, usage fees are charged to urge business units to improve meeting efficiency, and avoid inefficient use or low utilization of space and other resources, such as meeting rooms or workstations, thus improving space utilization rate. At the same time, the company conducts smart campus renovations, and enables digital and intelligent management based on its self-developed Digital Nebula platform. Transparent data of idle space helps ZTE launch more effective measures to increase space utilization. Also, the space management system can save about 5% of space.



**Workstation Allocation**  
Reasonable space allocation that ensures employees' comfort



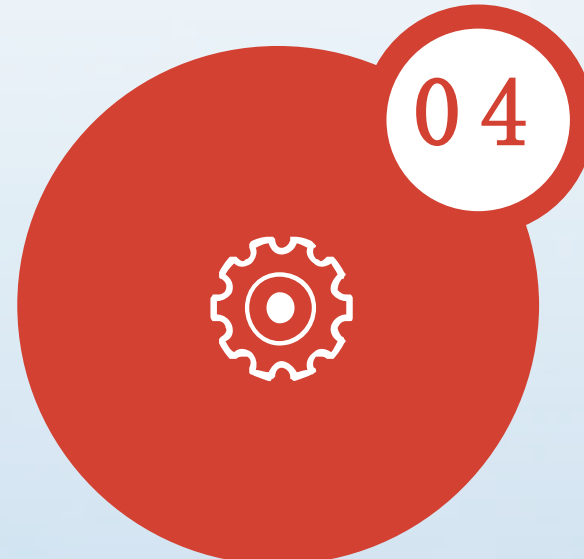
**Space Integration**  
Fragmented space integration for efficiency improvement



**Meeting Management**  
Meeting room charging mechanism that promotes efficient meeting culture



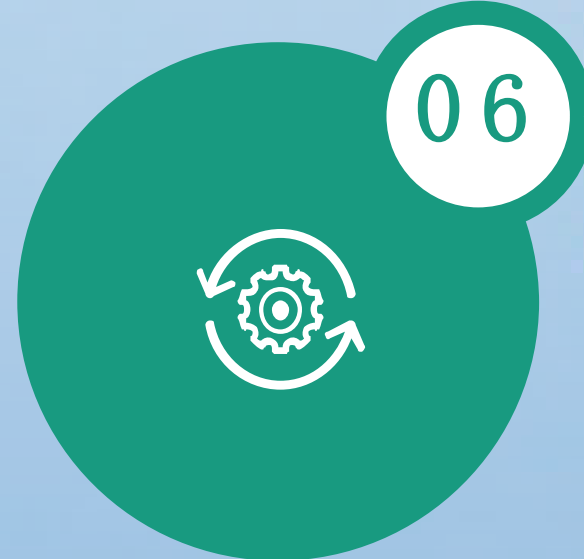
**Energy Management**  
Intelligent management of air conditioners and lighting of buildings



**Dormitory Allocation**  
Efficiency improvement through external on-demand rental and internal allocation of dormitories



**Apartment Allocation**  
Fair and efficient rental and allocation of apartments



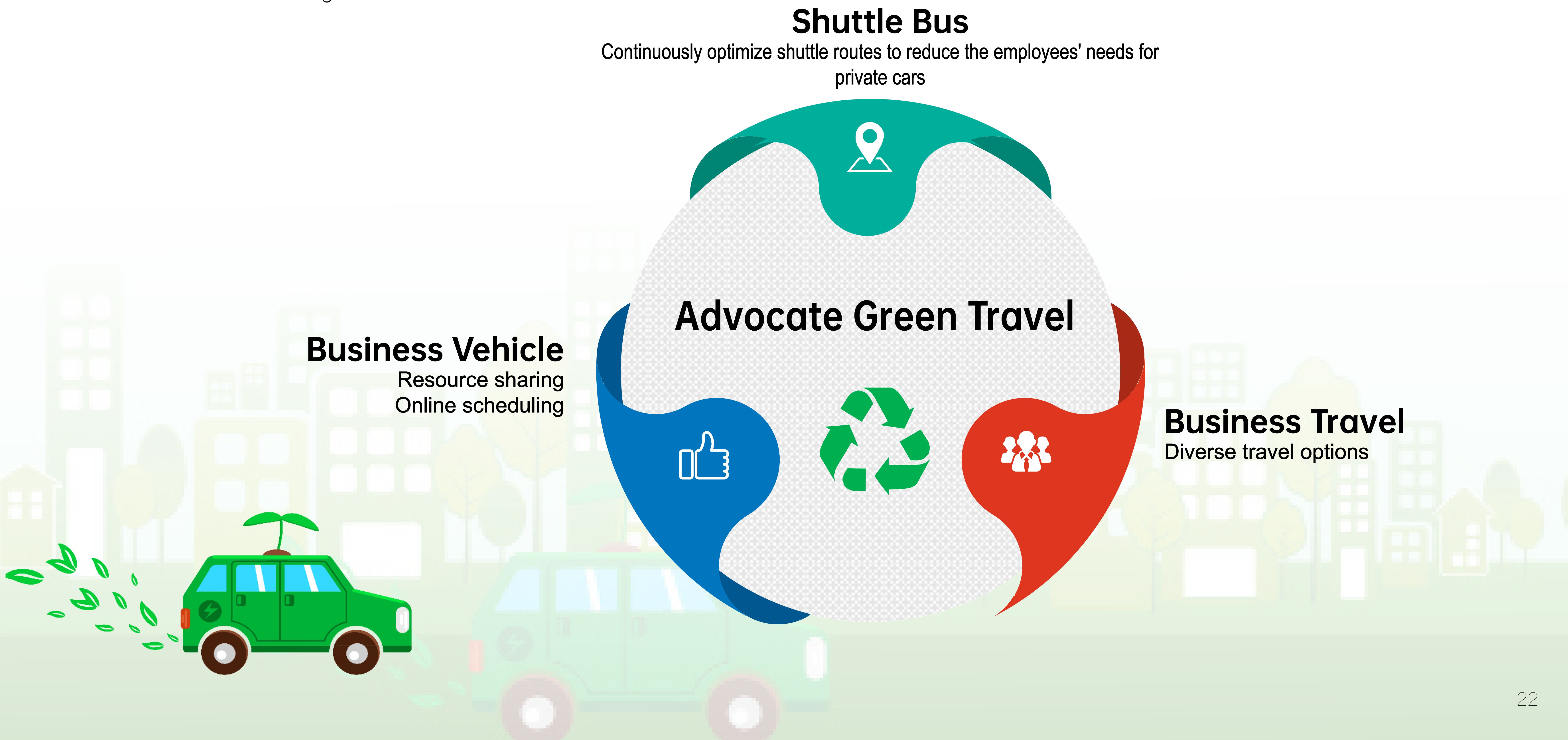


## Green Commuting

ZTE advocates green commuting, and encourages employees to go to work by public transportation, shared bikes, or on foot. By leveraging its own resources and social resources, the company provides shuttle buses, business travel services, and vehicle dispatching services to reduce the employees' usage of private cars and emissions from their daily commute and business trips. A business travel management system has been established for employees to enjoy more travel resources and choices.

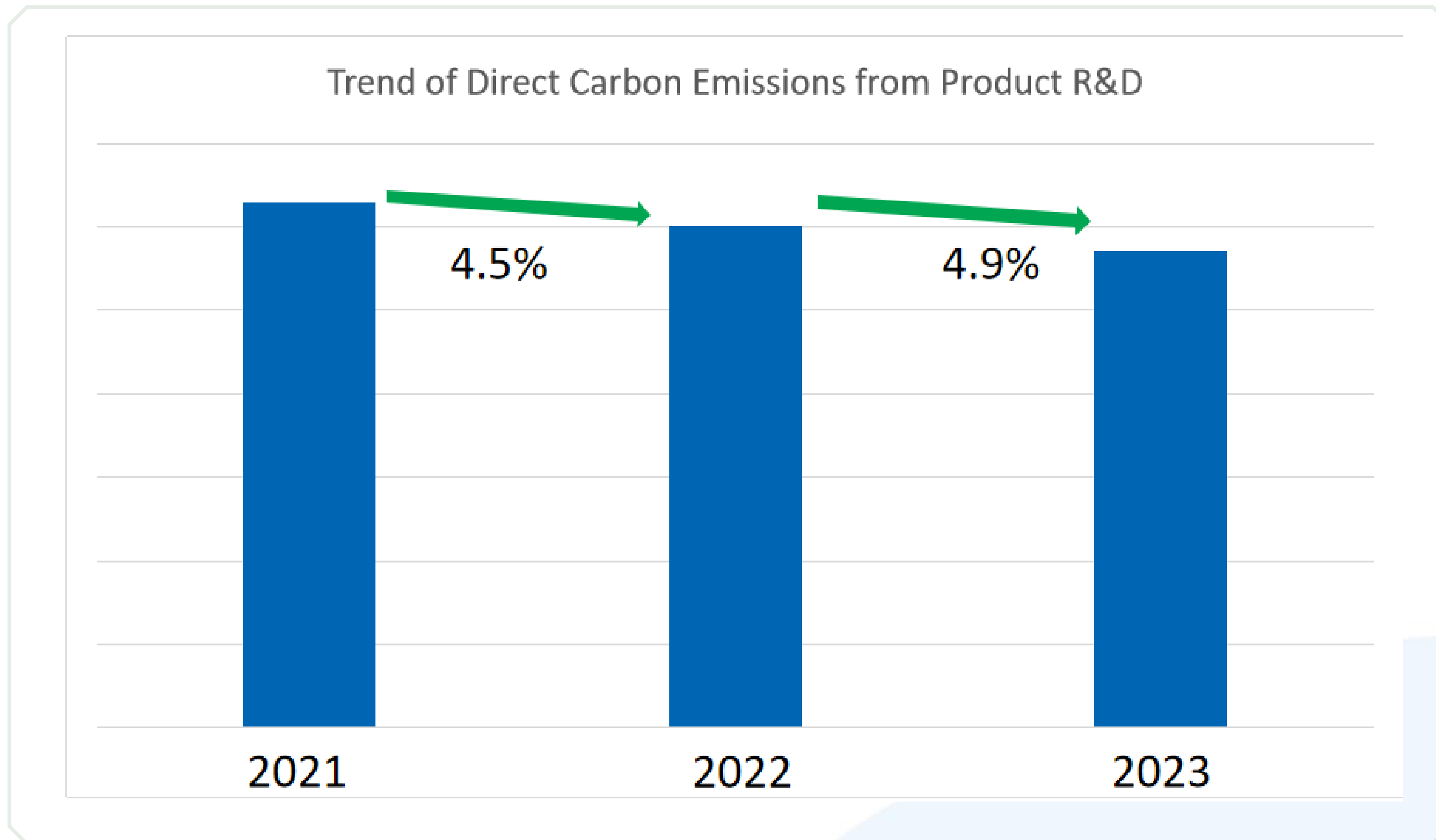
For the use of company vehicles, ZTE adopts a business vehicle management system for resource sharing. Through information-based scheduling, the total mileage of existing vehicles was reduced by 40%, maximizing utilization efficiency. In addition, ZTE has explored and piloted a low-carbon travel allowance and reward mechanism, further motivating employees to implement green commuting.

In the future, ZTE will further optimize shuttle bus routes, replace gasoline vehicles with electric vehicles, and improve the green travel reward system to continuously reduce carbon emissions from commuting.

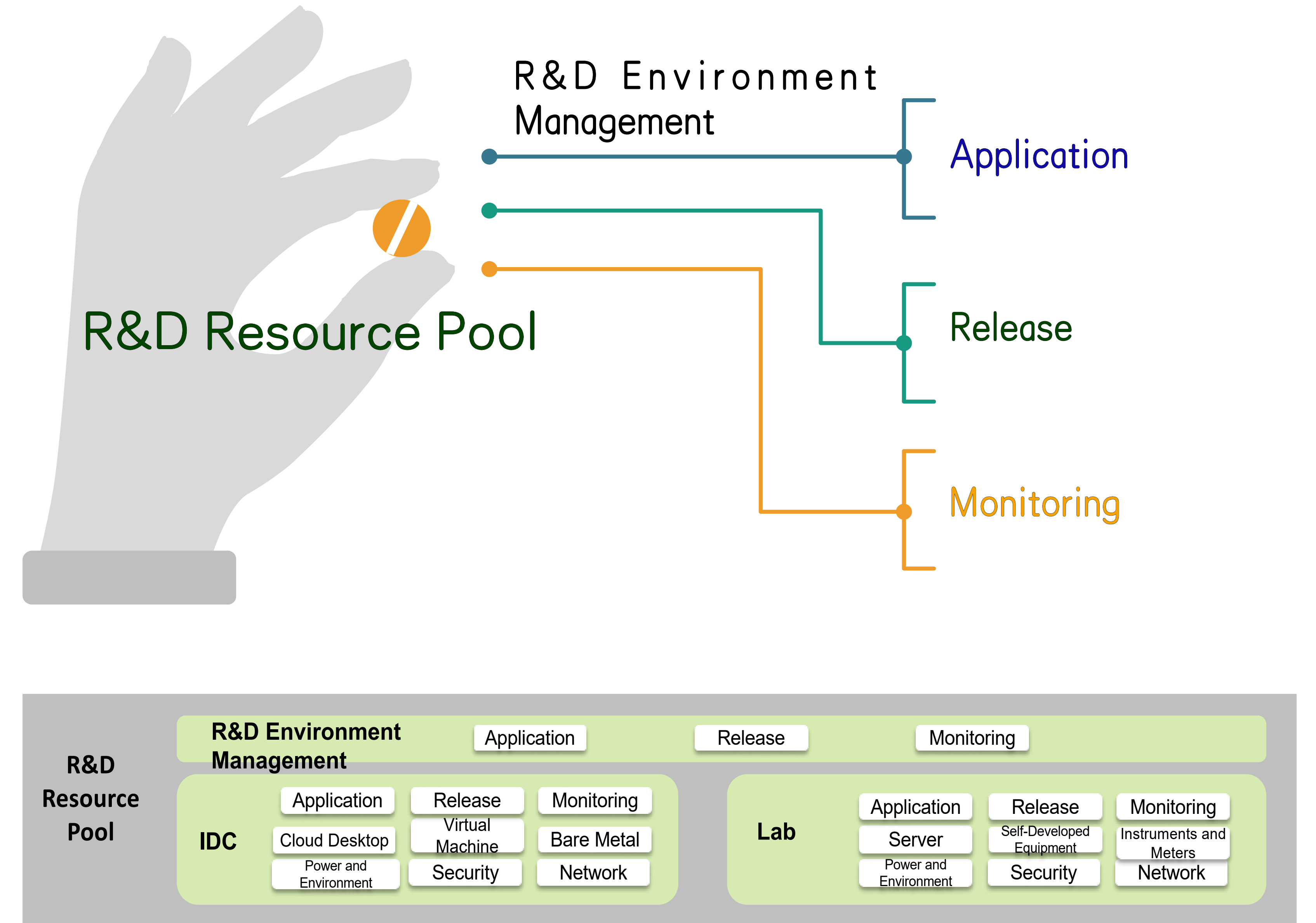


## Low-Carbon R&D

ZTE adheres to "Innovation, Convergence, and Green Development" in product R&D. It has identified energy-consuming R&D equipment (such as base stations, core networks, fixed networks, optical transmission, routers, switches, and servers), and established an R&D resource sharing pool, to accurately control the R&D equipment and energy consumption, optimize the heat dissipation of the R&D environment, and effectively utilize natural cooling sources, thereby reducing R&D energy consumption and carbon emissions every year.



## R&D Resource Pool



**Visualization and sharing of R&D resources:** The visualization, application, and release of R&D resources are designed from a user perspective. And R&D resources can be orchestrated, managed, and monitored from a management perspective. As more R&D resources are shared, there is less demand of resource allocation.

**Standard R&D resource pool:** Based on product R&D scenarios, a standard R&D resource pool was established. Through application and release of R&D resources, R&D units can enjoy lower cost of resource utilization. Meanwhile, digital operations enable reasonable allocation of various standard resources, leading to higher utilization rate of R&D resources.

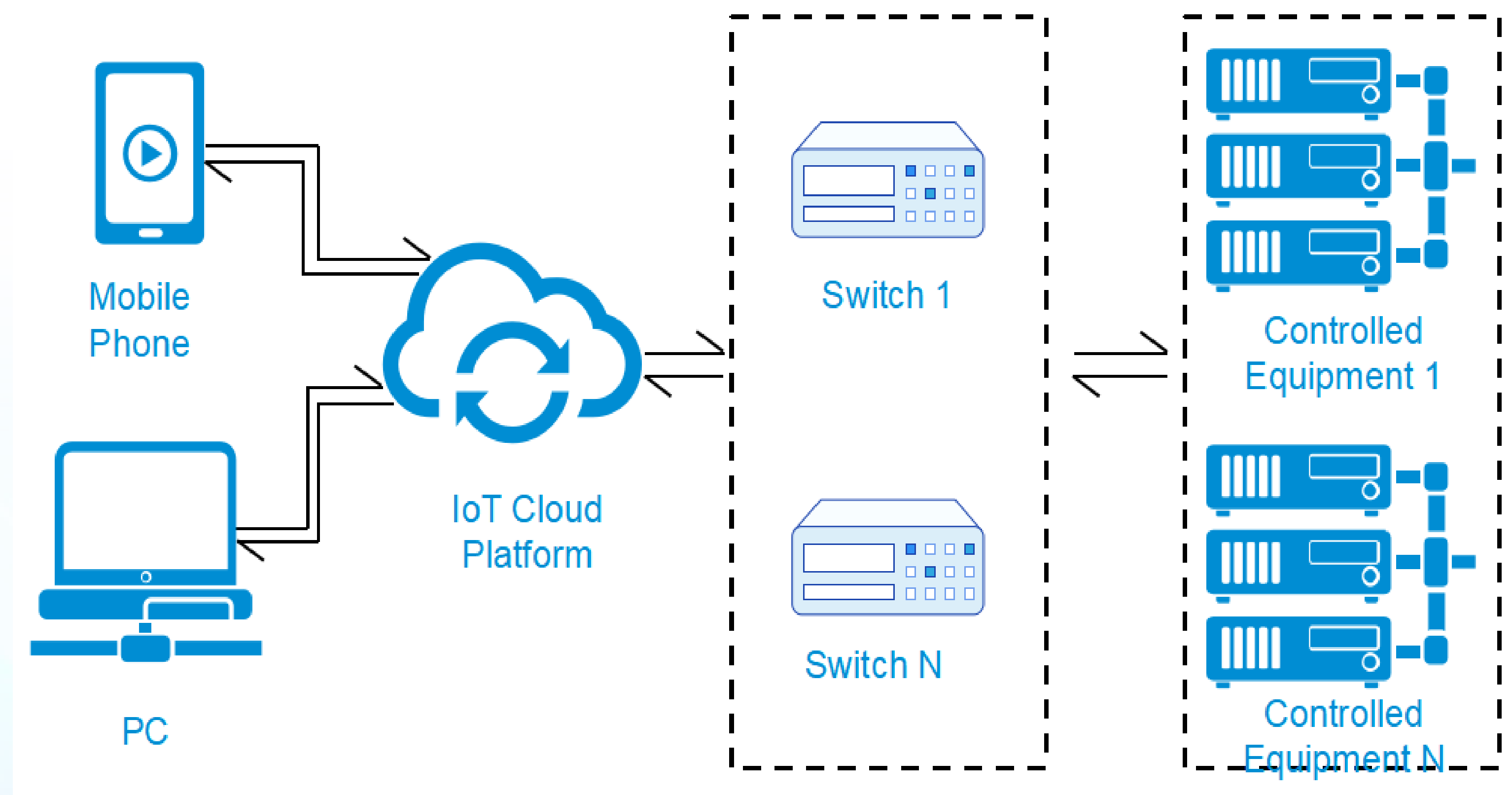
**VM live migration and shutdown of idle hosts:** ZTE deploys VM live migration and idle hosts shutdown idle hosts on cloud foundation, to ensure that servers are used only if needed. In Q1 2024, an average of 11.5% of hosts in the server computing power pool were shut down every day after VM live migration, further reducing resource waste.

## Energy Consumption Control of R&D Equipment:

Energy-saving strategy: Energy-saving strategies are implemented for different types of devices and application scenarios to reduce the energy consumption of devices operating in low loads, finally bringing down carbon emissions.

Equipment	Technical Solution for Energy Conservation	Power Consumption Reduction
Base Station	Automatic adjustment of the device power based on the loads, automatic hibernation and activation. The low-load AAU/RRU enters sleep/power-saving mode to reduce the power consumption of the base station equipment.	0.55KWh/unit*h
	Automatic power on/off of baseband board	0.01KWh/unit*h
Central Office Equipment	Automatic adjustment of the fan speed based on the loads. The fan speed and power of the low-load equipment are reduced.	10~30%
Server	BMC power capping	20%~30%
	Dynamic energy conservation of the BIOS	5%~30%
	Dynamic energy conservation of in-band OS	5%~30%
	Energy-saving mode of CPU C-States	10%~25%

**Accurate activation management:** By applying IoT technology, we have achieved on-demand resource application. The devices will be powered on after application approval, and shut down after usage. Therefore, idle load of devices can be prevented. As of Q1 2024, 70% of our product R&D equipment could be managed through the R&D environment management platform, ensuring on-demand use of R&D equipment.



### Heat Dissipation Optimization of Labs:

**Optimize heat dissipation, manage airflow, and eliminate hot islands:** Simulation technology is used to identify airflow interference and hot islands in the labs. ZTE organizes heat dissipation optimization and layout adjustment of labs, and isolates hot and cold air streams to prevent the mixing of hot and cold air and minimize the energy consumption of hot spots. For example, after building hot and cold aisles, the emissions of lab B2-9 were reduced by 18%.

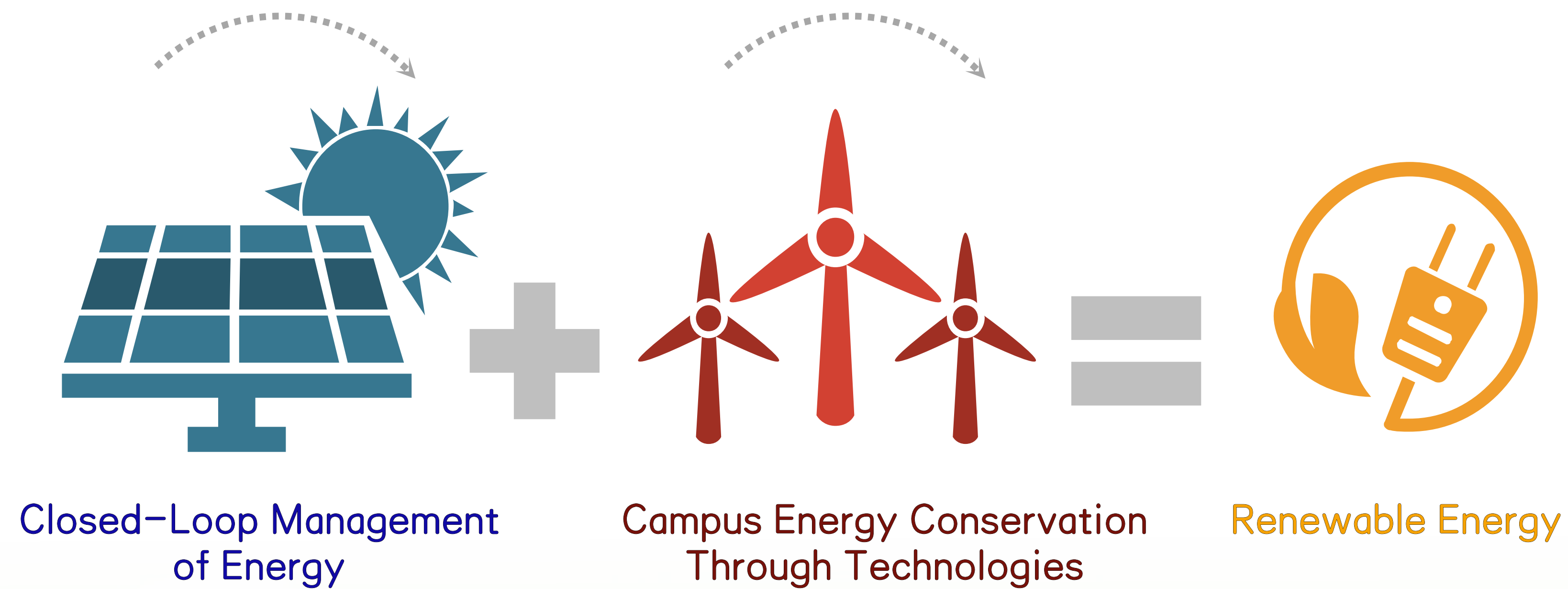
**Reduce energy consumption through natural cooling sources:** For campuses on the north of the Yangtze River, with low outdoor temperature in autumn, winter, and spring, we have replaced traditional air handling units with plate heat exchangers, indirect evaporative cooling systems, and fresh air systems to reduce power consumption of lab cooling system, and effectively lower the PUE of the equipment rooms. For example, in the cloud computing center of ZTE Xi'an Chang'an Base, after adding a cooling tower and plate heat exchangers to leverage the cooling sources in autumn, winter, and spring, annual emissions were decreased by 10.7%.



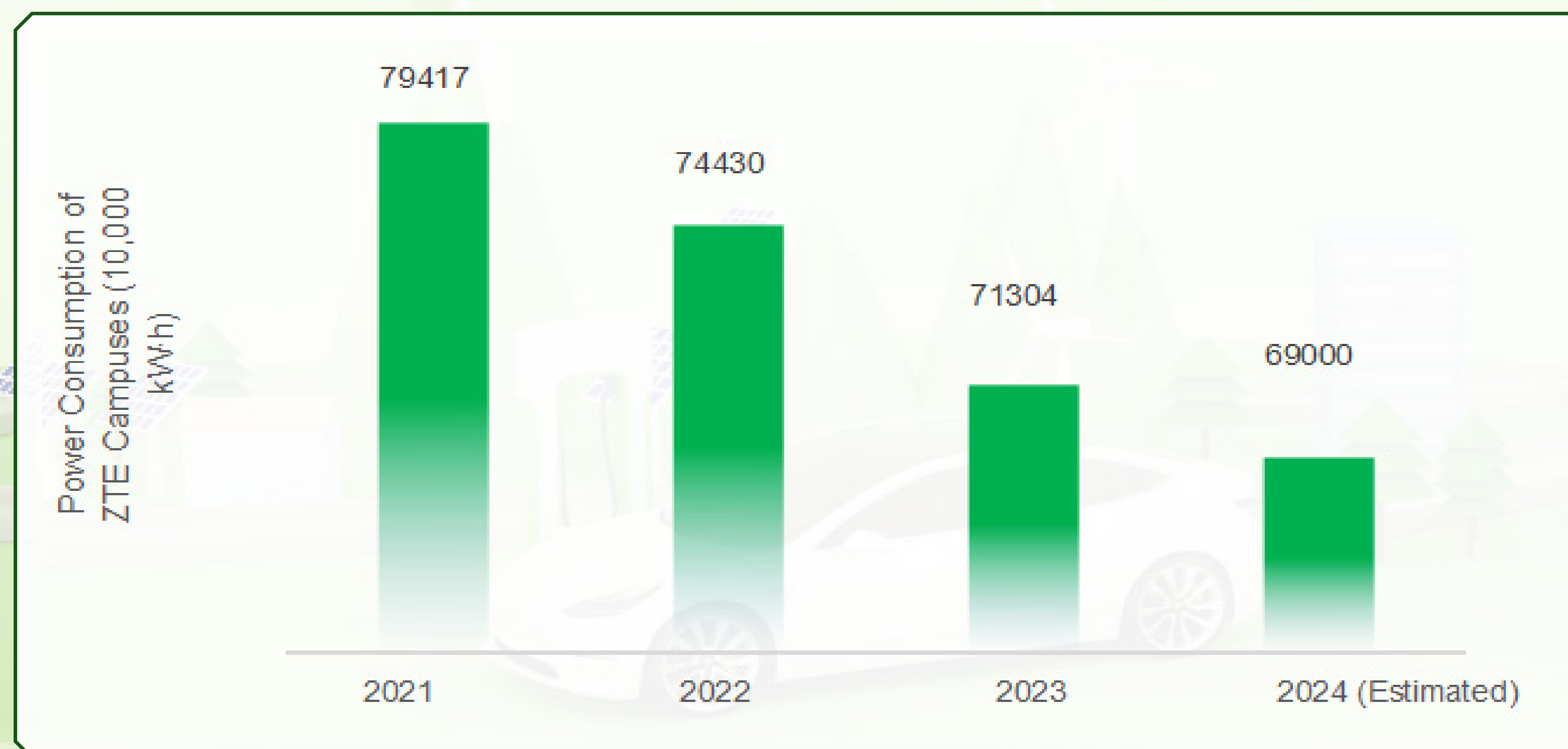
Cooling Tower and Plate Heat Exchangers that Use Natural Cooling Sources

## Low-Carbon Campus

To reduce carbon emissions of the campuses and achieve the net-zero goal by 2050, ZTE has established a special power-saving team to formulate the overall work plan and energy management paths. At the same time, ZTE continues to conduct renovation and upgrading of campuses for energy conservation and emission reduction, so as to improve the operating efficiency of equipment. Moreover, we also focus on the development of renewable energy, and constantly promote innovations and practices in management and technologies, effectively reducing carbon footprint of campus operations.

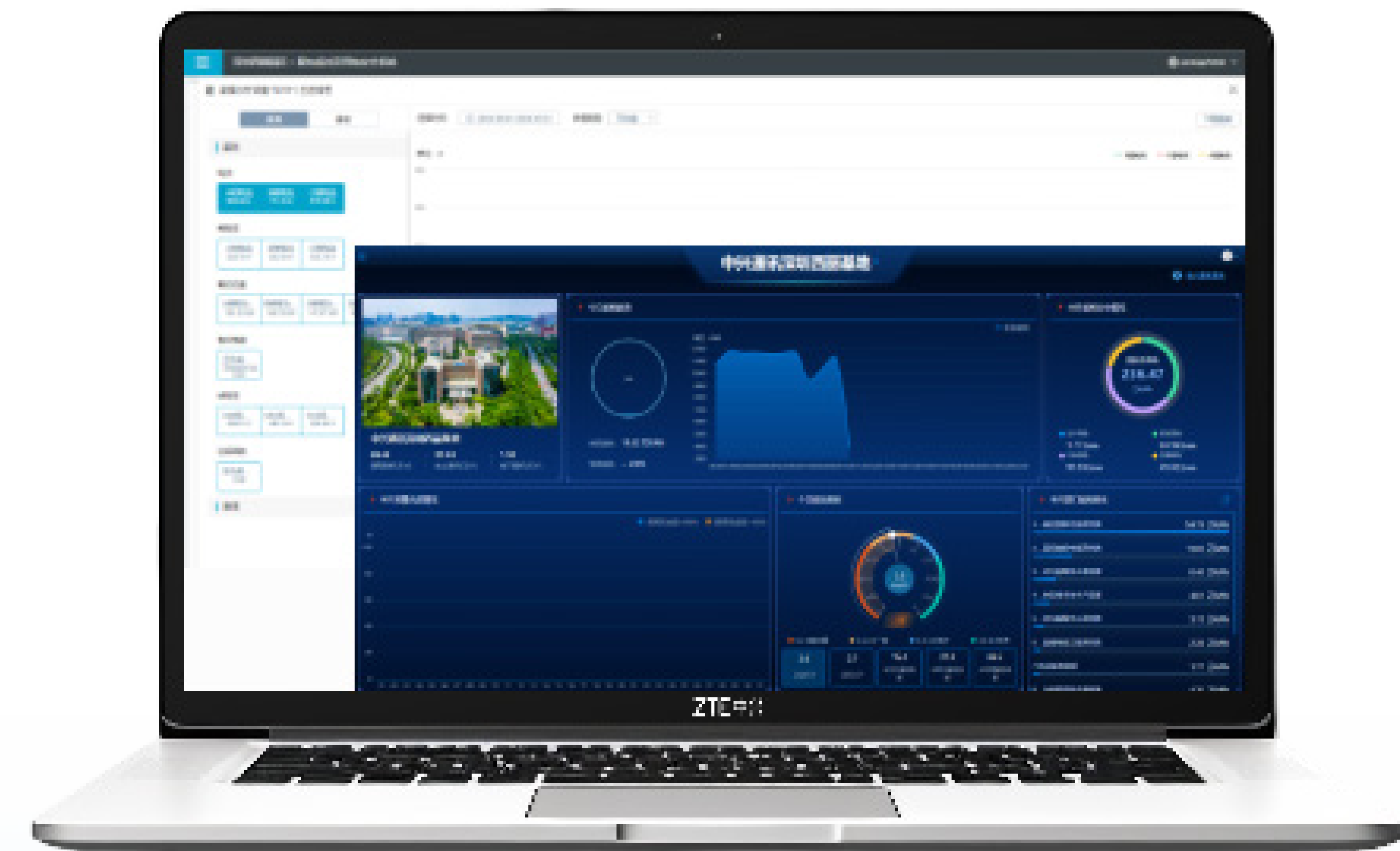
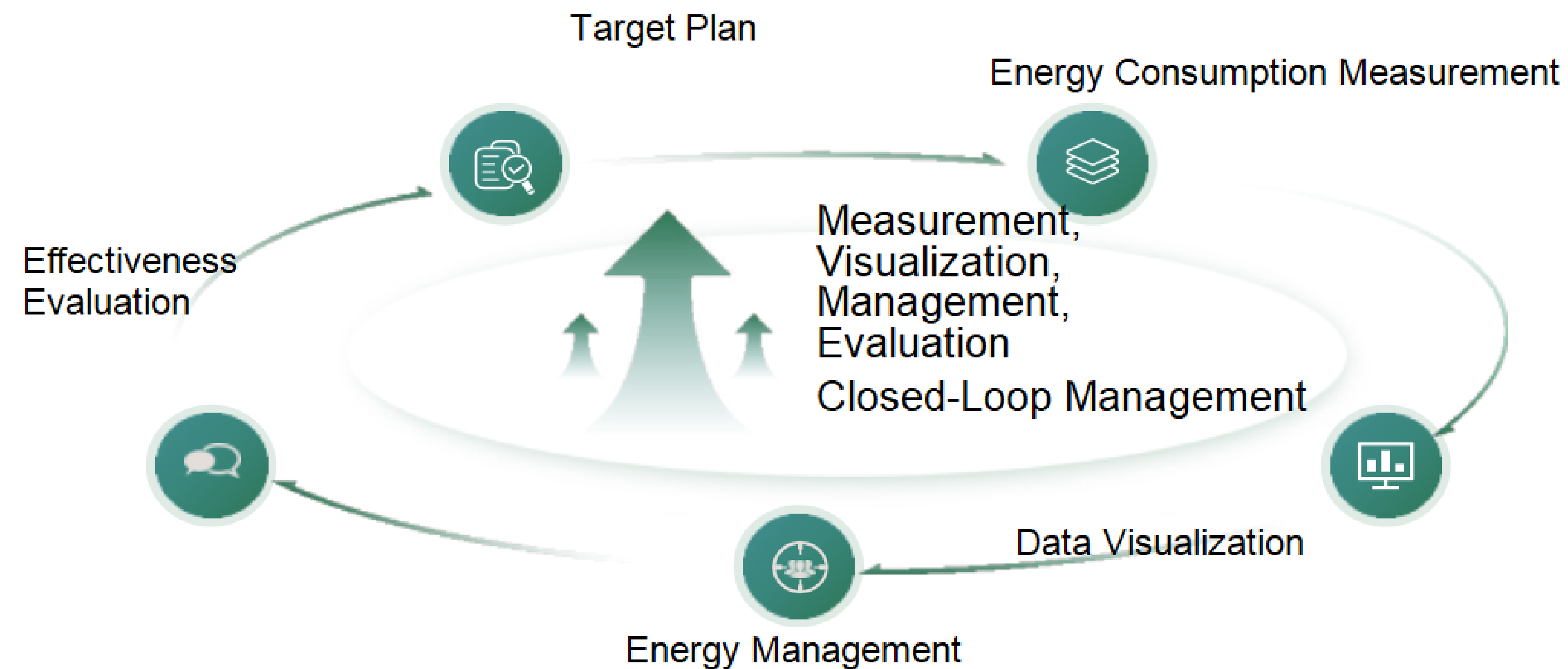


Thanks to improvement of management practices and the advancement of energy-conservation projects, in 2021, ZTE's power consumption peaked after rising in three consecutive years. In 2022 and 2023, power consumption declined by 6.3% and 4.2% year on year, respectively. While effectively reducing power consumption, ZTE has maintained its revenue growth, setting a good example for the industry.



Power Consumption of ZTE Campuses

## Energy Management



Energy Management System

### Closed-Loop Management of Energy

For effective energy conservation and emission reduction of campuses, in 2021, ZTE established a power-saving team and updated and released regulations such as the *Energy Management Manual* and the *Energy Conservation and Emission Reduction Management Process* to guide and evaluate energy management. In accordance with the ISO 14004 standard and internal regulations, the company has formulated management paths from four dimensions, including energy measurement, data visualization, energy management, and effectiveness evaluation, so as to identify major energy-consuming processes and conservation opportunities and continue to improve the energy efficiency.

Based on its energy management platform, ZTE strengthens its digital management model and constantly enhances its management. The energy management center acts not only as a platform that supports energy data collection, analysis, monitoring, and management, but also as the basis of its management principle of "Measurement, Visualization, Management, Evaluation". ZTE started to build the energy management center in 2018, and connected 14 campuses in China to this platform from 2019 to 2023.



Electricity/Carbon Visualization App

In 2023, ZTE expanded the capacity of power facilities in its campuses to meet the demands of business development. Based on the data analysis of the energy management center, the expansion plan was optimized to support more targeted expansion. The cost was decreased from an initial estimate of CNY26.06 million to CNY15.77 million, saving CNY10.29 million.

### Campus Energy Conservation Through Technologies

To reduce the energy consumption of campus operations, ZTE continues to upgrade existing energy-consuming equipment, including air conditioners, air cabinets, and compressors, based on Energy Performance Contracting (EMC) for higher energy efficiency.

Take air conditioner adjustment in the Shenzhen Xili Base as an example, ZTE replaced old air conditioners with inverter air conditioners. By optimizing the air volume and speed through model algorithms, and applying variable frequency drives and fresh air valves, the company has improved energy utilization efficiency. It is expected that the annual energy conservation rate can reach 30%, directly reducing power consumption by 3.68 million kWh.

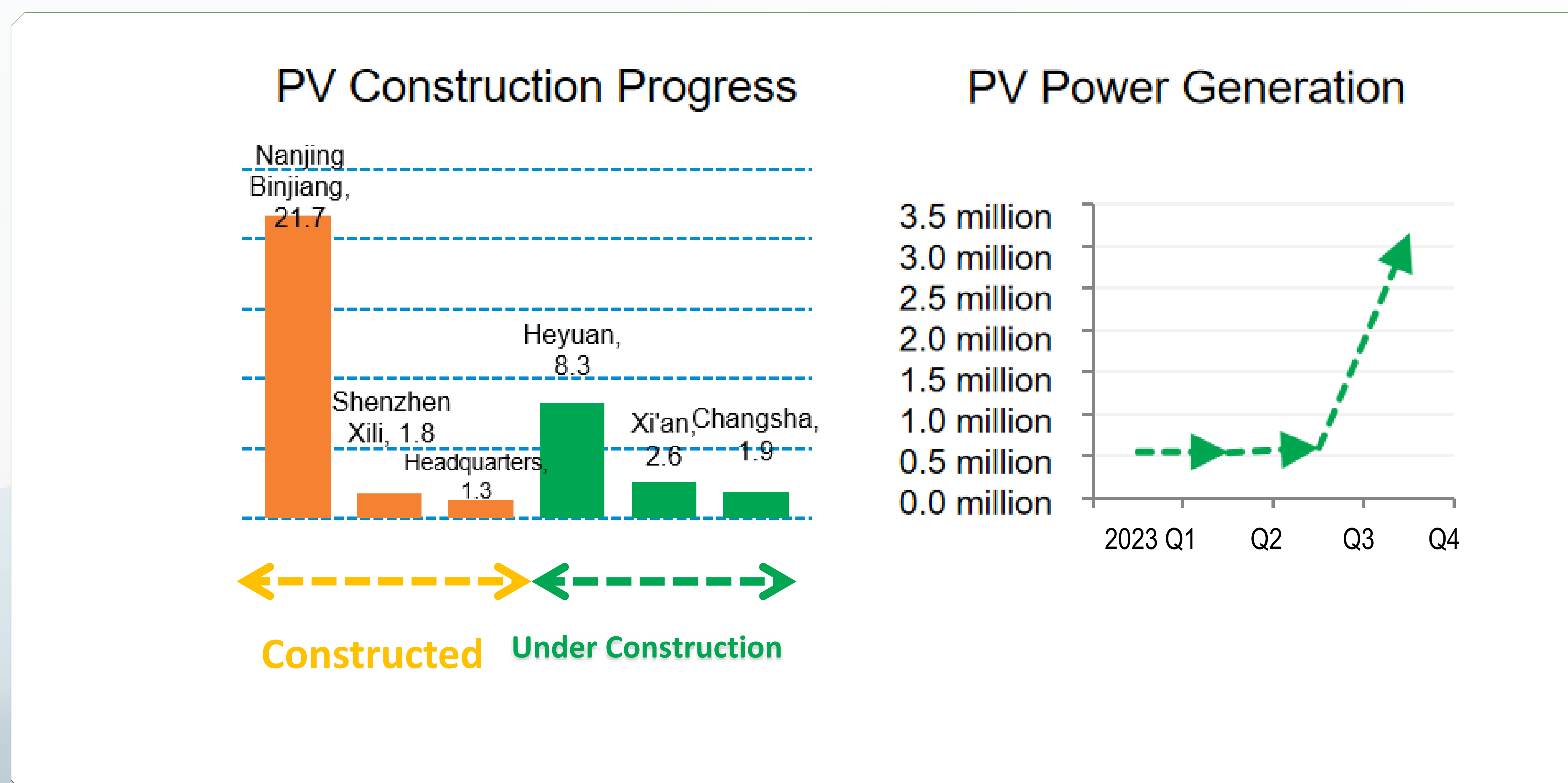
2023 ZTE Campus Energy Conservation Programs:

No.	Program	Implementation Solution	Energy Conservation
1	The incorporation of VFD within central air conditioning systems in Shenzhen Xili Base and Heyuan Base	The AHU's frequency is changed from a fixed frequency to a variable frequency, and the intelligent air conditioner management platform is used to optimize the air volume and speed, improving the energy utilization rate.	Annual energy conservation rate is expected to reach 30%, saving 5.4 million kWh of electricity per year.
2	Smart parking program	Intelligent lighting and air conditioner switches are connected to the Digital Nebula application system to set up timers for air conditioners and lights and enable remote control, saving labor costs and energy consumption.	Theoretically, energy conservation rate can reach 20% to 30%, saving 440,000 kWh of electricity per year.
3	Laboratory fresh air system application	Precision air conditioners in labs are replaced by fresh air systems, and the cold and hot aisle are built, so that the operating efficiency is maximized.	It is expected to save 40% of the power consumption compared with using precision air conditioners.
4	Application of spraying technology in multi-split air conditioners in Xi'an Chang'an Base	Spraying technologies are applied in the outdoor units of the air conditioner to cool down the air around the condenser and the fins of the heat exchanger, thereby improving the heat exchange efficiency of the units.	Annual energy conservation rate is expected to reach 6%, saving 50,000 kWh of electricity per year.

## Renewable Energy

To achieve the "dual carbon" targets, we need to minimize our dependence on fossil fuels. In recent years, ZTE has continuously raised the proportion of clean energy used in its campus operations, actively developed renewable energy projects, and planned to build PV power plants in cities such as Shenzhen, Heyuan, Nanjing, Xi'an, and Changsha. By the end of 2023, the installed capacity of PV reached 24.8MW. By the end of 2024, the construction of PV power plants in all campuses will be completed, with an installed capacity of 37.6MW, nearly a 13-fold increase in the past two years.

In 2023, ZTE's self-built PV power plants generated a total of 4.847 million kWh of electricity. From Q1 to Q3, 1.691 million kWh was generated. In Q4, the construction of Binjiang PV power station was completed, and 3.157 million kWh was produced, which was about 4.3 times higher than that in Q3.



Energy transition is the key to achieve net-zero goal in the future. ZTE will continue to increase the proportion of clean energy in its energy mix, and maintain a leading position in clean energy use through the construction of PV and wind power facilities and green electricity trading. Moreover, we will further promote the EMC model, energy-saving renovation technologies, and mature solutions in various industries, so as to make greater contributions to building a low-carbon society.



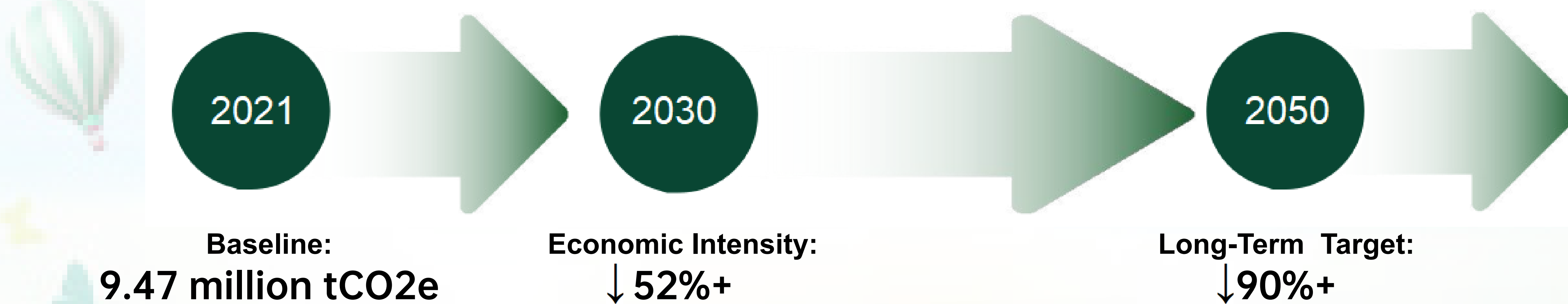
## Green Supply Chain

ZTE sticks to sustainable development. Our supply chain covers the end-to-end process from raw material introduction, production, and product delivery to product recycling and reuse. According to internal and external environments, we work with partners to promote low-carbon procurement, manufacturing, logistics, and recycling, accelerate green transformation, and build a green supply chain with green operations, supporting the achievement of science-based targets.

### Composition



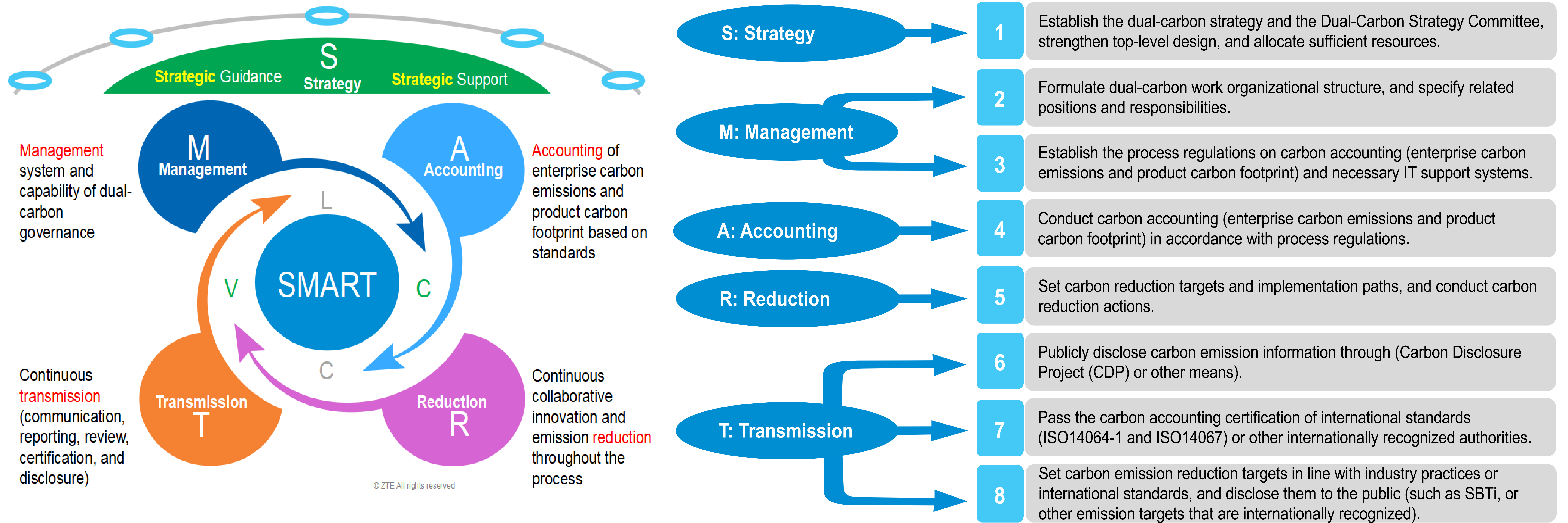
### Milestones



## Low-Carbon Procurement

ZTE is not only actively reducing its own carbon emissions, but also promoting carbon reduction among upstream suppliers, so as to work together to reduce GHG emissions in the value chain.

ZTE developed the "SMART Model of Dual-Carbon Governance" from five dimensions: strategy, management, accounting, reduction, and transmission. This model serves as the basic methodology for low-carbon procurement. On top of that, ZTE formulated the "Eight Steps for Dual-Carbon Governance of Suppliers" to guide suppliers in achieving carbon peak and neutrality. This model won the 2023 Science and Technology Progress Award from the China Federation of Logistics & Purchasing.



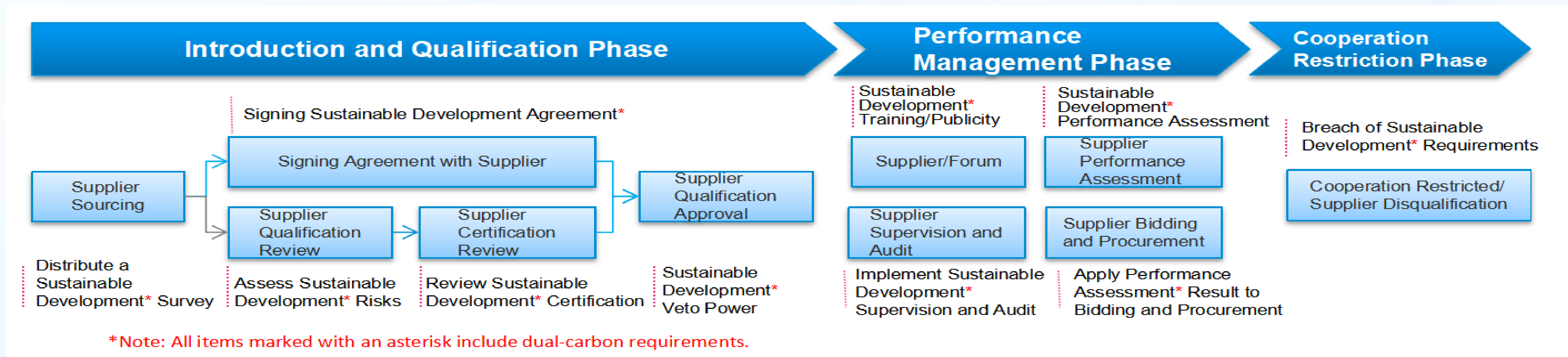
Left: SMART Model of Dual-Carbon Governance

Right: Eight Steps for Dual-Carbon Governance of Suppliers

## Low-Carbon Procurement Management

ZTE has integrated the requirements of low-carbon sustainable development into the Supplier Code of Conduct, clearly communicating these requirements to suppliers and continuously increasing the scope and proportion of low-carbon procurement.

Throughout the entire supplier management process, which includes on-site audits, training, performance assessment, and bidding and procurement, ZTE requires its suppliers (and sub-tier suppliers) to adhere to the same standards to reduce environmental impact and achieve low-carbon transformation.



### Low-Carbon Requirements Incorporated into the Supplier Management Process

Based on the "SMART Model of Dual-Carbon Governance" and the "Eight Steps for Dual-Carbon Governance of Suppliers", ZTE has compiled the *Supplier Dual-Carbon Audit Checklist* and incorporated it into the on-site audit process for suppliers. In 2022 and 2023, the company conducted dual-carbon audits on a total of 259 suppliers, and will continue to further strengthen these audits in the future. For non-conformities identified during the supplier dual-carbon audits, ZTE guides suppliers in the formulation of corrective action plans through the Supply Chain Collaboration (SCC) website, and tracks, verifies, and settles these non-conformities.

Additionally, ZTE uses the supplier dual-carbon audit results as an important indicator in the assessment of supplier's sustainable development, incorporating them into the supplier performance assessment process, and ultimately applying them to bidding and procurement.

## Enhancement of Supplier Capabilities for Low-Carbon Operations

Through diverse forms of capability training and building, ZTE actively promotes the enhancement of suppliers' capabilities of dual-carbon governance and works with partners for mutual growth. In 2022, ZTE organized in-person training in dual-carbon governance for more than 110 participants from over 80 suppliers, and online training in product LCA carbon footprint assessment for more than 350 participants of over 170 suppliers. In 2023, ZTE organized dual-carbon training for 200-plus participants from 96 suppliers, and online training in the EU carbon tariff policy interpretation for 30 suppliers. Meanwhile, ZTE has actively promoted initiatives for energy conservation and emission reduction among suppliers, such as the CDP's initiatives, Joint Audit Cooperation (JAC) initiative, and SBTi.

## Upstream and Downstream Collaborative Emission Reduction

ZTE has issued *A Letter Regarding Requirements for ZTE Suppliers to Start Dual-Carbon Strategy Planning* to global suppliers. It provides guidance on how to effectively conduct carbon footprint verification, set emissions reduction targets, formulate emissions reduction measures, and publicly disclose carbon emission information. As such, the company works with upstream and downstream partners for green development, enhancing the competitiveness of the supply chain, and jointly building a low-carbon sustainable ecosystem.

The data from the *CDP 2023 Climate Change Questionnaire* showed that among the 300-plus strategic core suppliers of the company, 81 participated in the CDP rating and disclosure and submitted the response publicly. Among the 81 suppliers, 17 (21%) achieved a Leadership (A/A-) rating, and 27 (33%) received a Management (B/B-) rating. ZTE supports and assists suppliers in developing green, low-carbon products and services. Joint efforts have been made to deeply explore opportunities for lower carbon emissions in the supply chain. For example, low-carbon product design, material-saving product design, selection of low-carbon new products, energy-saving improvement of processes and equipment, energy-saving renovation of equipment, use of recyclable and reusable materials, fuel conversion (from diesel to natural gas, for instance), renewable energy as a substitute (such as solar photovoltaic power generation), and purchase of green electricity.

## Cases of ZTE's Collaboration with Suppliers in Carbon Reduction

### [Case] Collaboration with ZTT Group: Low-Carbon and Material-Saving Design of Cable Products

The cable wrapping technique was optimized, saving about 60% electricity per meter during the cable-making process.

The insulation material and structure of the CAT5e 4-core Ethernet cable were improved, saving 20% insulation material for 20AWG cables and 9% for 22AWG cables.



### [Case] Collaboration with Camelot Electronics: Material-Saving Product Design of PCBs

Through software development, the calculation method for PCB panelization is changed from set to unit, material efficiency is effectively increased.

The utilization rate of single- and double-sided boards increased from 83% to 83.5%, and multi-layer board utilization increased from 80% to 80.5%, saving about 6% of the board materials.

### [Case] Collaboration with Founder PCB: Energy-Saving Improvements in PCB Production Process

Chiller water booster pumps were added to the horizontal copper plating line and VCP line to reduce the main pipe pressure and the main pump power, saving 170,280 kWh of electricity and reducing greenhouse gas emissions by 136.94 tCO<sub>2</sub>e annually.

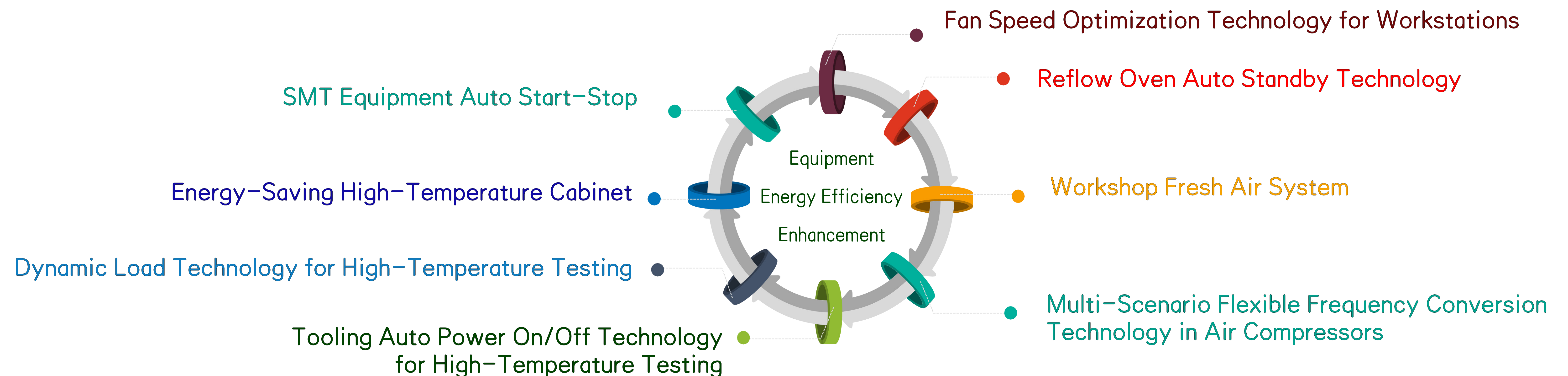
## Low-Carbon Manufacturing

Driven by a goal of building a green and intelligent "zero-carbon factory" and a digitization and green culture, ZTE has been adopting low-carbon processes, enhancing equipment energy efficiency, and revolutionizing its smart factories. By doing so, the company aims to create a new science-based carbon reduction system, setting an example for green manufacturing.

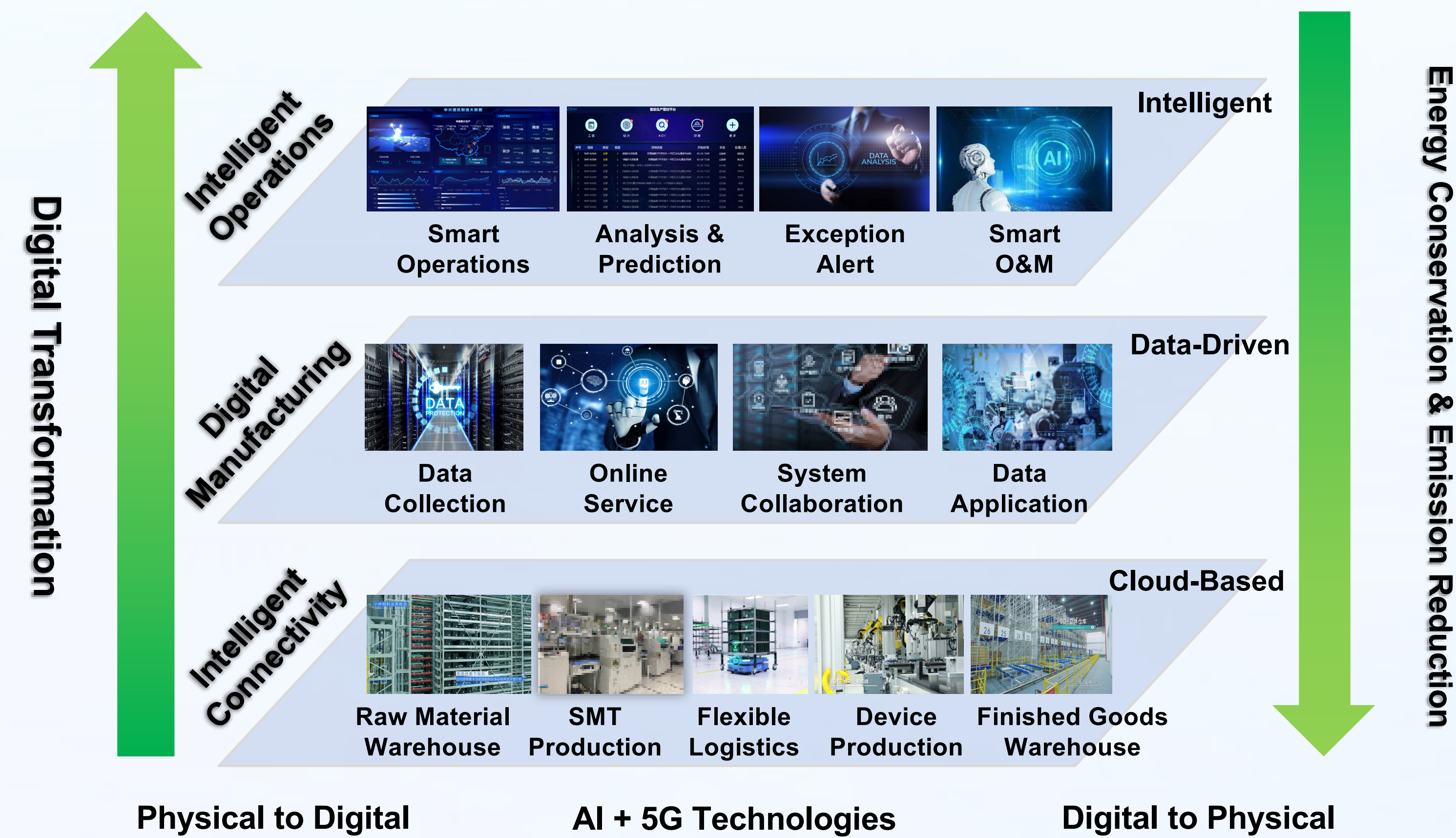
In 2023, fifteen energy-saving key projects were completed, reducing manufacturing electricity consumption by 27.3% and saving 88.94 million kWh as compared to 2021. And ZTE (Heyuan) Company Limited was included in the 2023 Green Manufacturing List released by the Ministry of Industry and Information Technology of China.

**Adopt low-carbon processes:** By employing the optimal process design, ZTE maximizes the reduction of energy consumption per unit output while meeting the quality standards and market demand. For example, the company promotes full surface mounting process design for PCBs, applies low-temperature solder paste, minimizes tooling in production, and merges production processes, to fundamentally reduce energy consumption.

**Enhance equipment energy efficiency:** Through the analysis of the entire production process, the company focuses on high energy-consuming processes, and manages to reduce energy consumption and improve energy efficiency through technical measures. Such measures include the auto start-stop of SMT equipment, energy-saving optimization of high-temperature aging and testing, and application of variable frequency technology for air compressors. Based on the production plans, efforts are made to predict the number of air handling units required for production and hence adjust the number of chillers and air-conditioning equipment to be activated. Therefore, energy usage in the production environment is effectively lowered. Additionally, variable-frequency renovation is carried out for the air handling units in the workshops to reduce the power consumption of air conditioning.



**Smart Factory Revolution:** ZTE is committed to building industry-leading green smart factories. In the factory, 5G, AI, and other technologies are used to achieve intelligent connectivity, digital manufacturing, and smart operations, thus promoting high-level, intelligent, green, and sustainable development.



## [Case] ZTE's Smart Factory for Server and Storage Products in Nanjing

ZTE has followed the idea of intelligent and green development in the planning and construction of the smart factory. It enables fully lights-out manufacturing by adopting advanced equipment and technologies, such as 5G cloud-based AGVs, multi-robot collaboration, AI-powered machine vision, green intelligent cloud testing, and green automated packaging technology. In the factory, intelligent sensors collect real-time data on equipment operation and energy consumption. The digital twin driven by data and algorithms ensures the efficient and healthy operation of the factory, reducing the energy consumption per product by 30%.



Green Intelligent Cloud Testing

5G + AGV + Flexible Docking + Cloud Testing



Green Automated Packaging

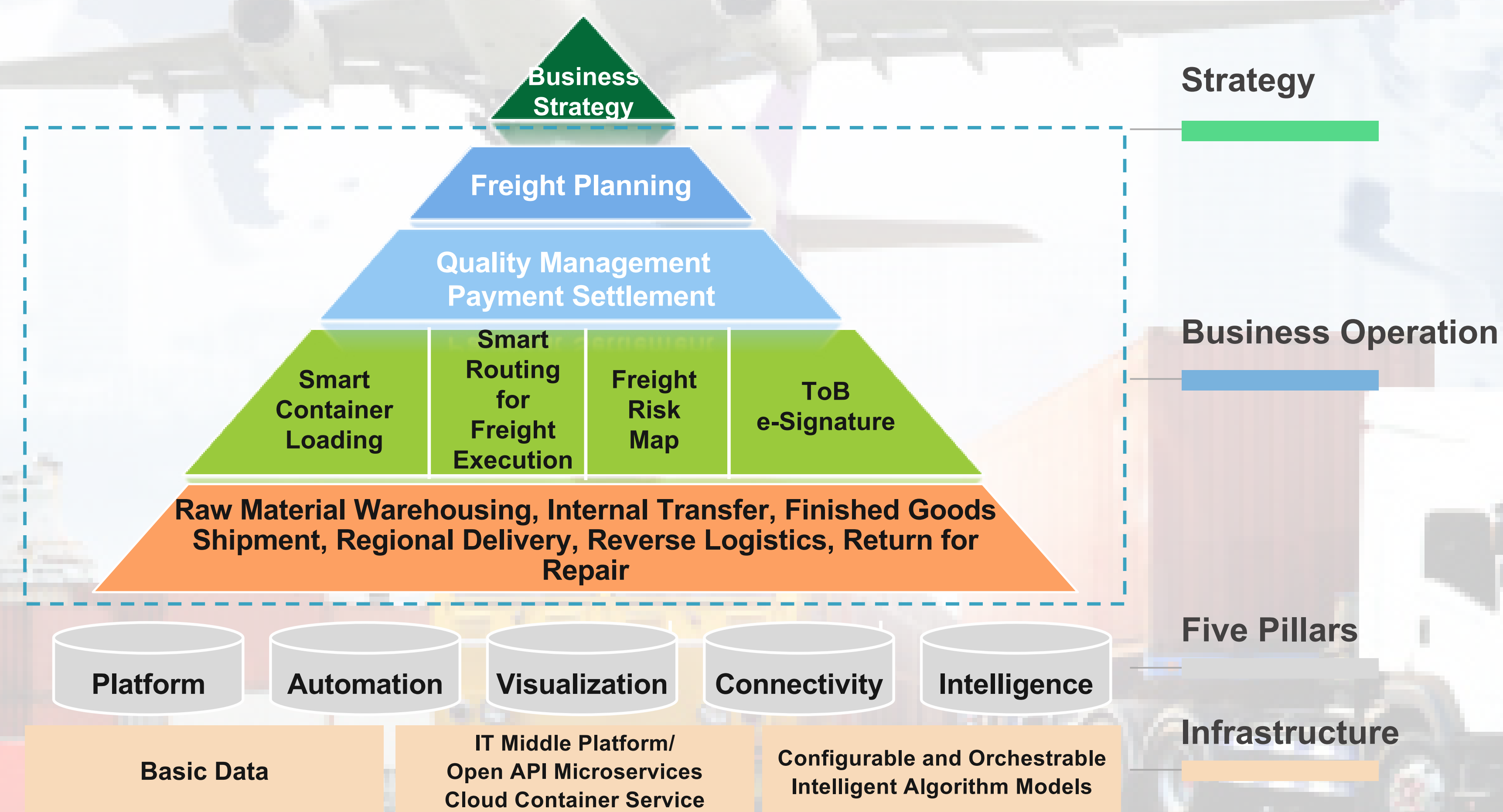
5G + 3D Machine Vision + AI Computing

## Low-Carbon Logistics

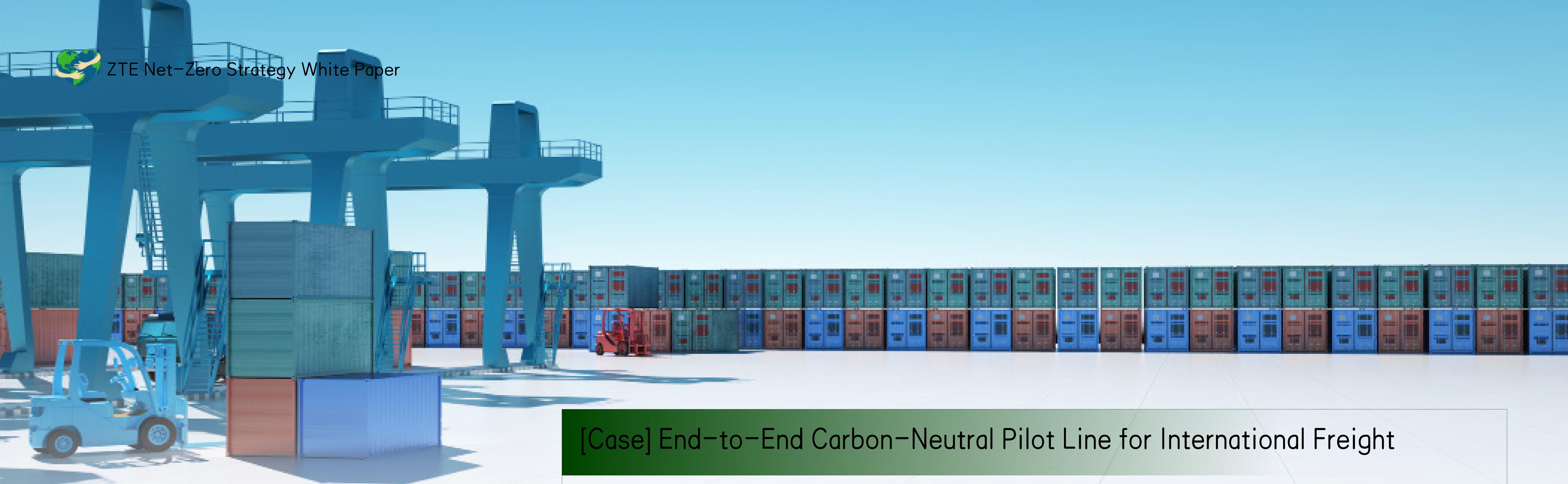
ZTE makes full use of logistics resources and adopts advanced logistics technologies to plan and implement logistics activities, including transportation, storage, packaging, loading and unloading, material movement, distribution processing, delivery, and information processing. In this way, the company strives to reduce the environmental impact of its logistics activities. Moreover, ZTE is dedicated to promoting digital and intelligent transformation in its logistics activities, actively embraces energy revolution, and prioritizes low-carbon transportation. With these efforts, the company aims to create a low-carbon logistics ecosystem and become an active practitioner and industry leader in the construction of low-carbon logistics for manufacturing enterprises.

## Emission Reduction in Transportation

ZTE achieves fully paperless freight management through the continuous construction of its global freight management system, iLMS. By optimizing the global logistics network and promoting intelligent routing, the company effectively reduces transportation distance. Continuous carbon reduction is realized in logistics transportation through measures such as multimodal transportation, preference for low-carbon transportation, and improvement of the cargo loading efficiency. Digitalization and intelligence: The iLMS system is the unified platform for ZTE's global freight management. All logistics and transportation information is transmitted through the system. Therefore, paperless management is achieved, reducing logistics carbon emissions, improving operational efficiency, and shortening the freight cycle. With the iLMS system, ZTE won the Second Prize of the 2023 Science and Technology Progress Award from the China Federation of Logistics & Purchasing.



Application Scenarios of the Intelligent Logistics Management System (iLMS)



### [Case] End-to-End Carbon-Neutral Pilot Line for International Freight

**Improve cargo loading efficiency:** By optimizing packaging processes, planning shipment batches and volumes, using a smart container loading system, and assigning dedicated container loading personnel, ZTE has taken various measures to enhance cargo loading efficiency. Compared to 2021, the container loading efficiency is increased by 4% in 2023.

**Prioritize low-carbon transportation:** ZTE continuously reduces the proportion of air freight by replacing it with rail and sea transport. The company also actively introduces new energy vehicles to replace traditional fuel-powered ones. In 2023, the proportion of new energy vehicles transporting finished goods from ZTE's Nanjing manufacturing base to the port of departure reached 46%. For the finished goods transferred from Changsha to Shenzhen, rail freight was used as an alternative to road freight, accounting for 33.4%.

**Optimize transportation routes:** Working with logistics service providers, ZTE has refined transportation routes to shorten the travel distance. Additionally, the company reduces transfers between warehouses by delivering goods from the nearest locations.

In June 2023, together with Lufthansa and Sinotrans, ZTE picked up goods from its factory in Nanjing to Shanghai Pudong Airport with electric trucks, transferred the goods to Frankfurt Airport in France by air with Sustainable Aviation Fuel (SAF), and then to the warehouse in Madrid, Spain by road. In terms of the carbon footprint in this process, the company bought carbon offsets under the Verified Carbon Standard (VCS) and International-Renewable Energy Certificate (I-REC) in strict accordance with the international standards ISO 14064-3: 2019 and PAS 2060: 2014, to conduct carbon offsetting of the project and achieve carbon neutrality in the "end-to-end" logistics services.



On June 29, 2023, ZTE received the "Verification Statement of Achievement of Carbon Neutrality" issued by SGS, signifying that the "end-to-end" carbon-neutral green logistics solution has been verified.



## Emission Reduction in Warehouse

**Digitalization:** All warehouse operations of ZTE are managed through the Warehouse Management System (WMS), which exchanges data with the Manufacturing Execution System (MES) and the iLMS system through EDI. As such, online management of inbound/outbound operations, inventory management, and settlement is realized. In 2023, the company reduced a total of 2.85 million paper documents globally by optimizing the outbound operation documents and the handover process with logistics service providers, as well as adding e-signature functions for those documents.

**Warehouse automation:** From 2021 to 2023, ZTE continuously strengthened the automation and intelligence of its warehouses. With 5G, digital twins, and intelligent warehousing technology, we have built intelligent sorting centers for both raw materials and finished products in ZTE's Binjiang Base in Nanjing. In addition, we pioneered a long-distance 5G-powered rooftop conveyor system across buildings. It enables automated and intelligent conveyance taking in raw materials, putting materials on production lines, to warehousing the finished products. As such, fuel-powered vehicles are no longer needed for goods transportation within the industrial park, reducing carbon emissions by 100,000 tons annually, this project won the First Prize of the 2022 Science and Technology Progress Award from the China Federation of Logistics & Purchasing.



Intelligent Operations Center Based on Digital Twins



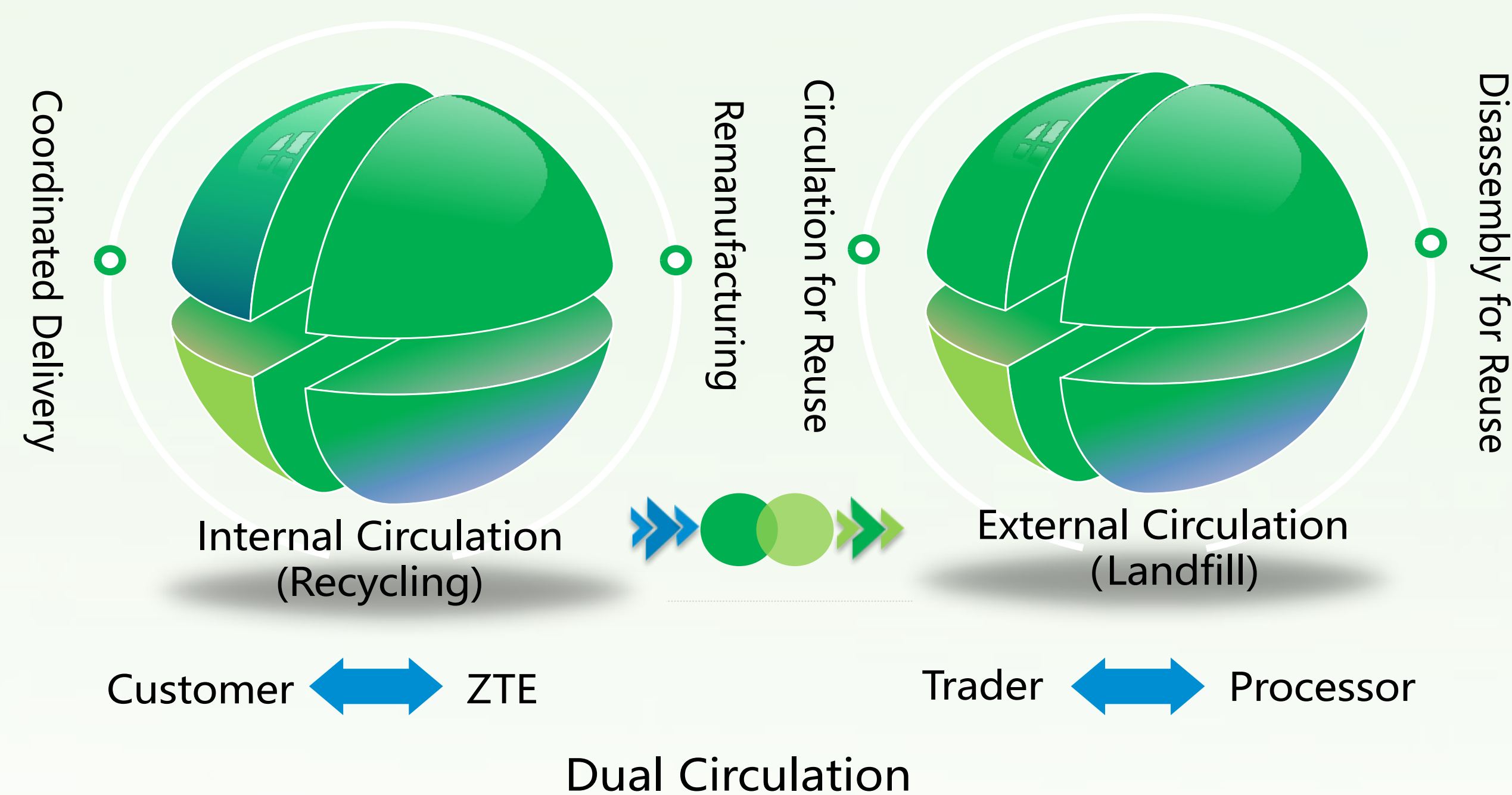
Stereoscopic Warehouse

**Energy-saving control:** Routine energy-saving control standards are formulated for warehouses, and an inspection and supervision mechanism is established based on the standards. In the automated operation areas of the warehouses, lights-out management is implemented to effectively save electricity for lighting, equipment, and facilities.

**Application of low-carbon energy:** According to ZTE's plan, all forklifts in the company's domestic warehouses will be green electric ones, and more than 68% of fuel forklifts will be replaced with green electric ones in its overseas warehouses.

## Low-Carbon Circulation

Adhering to the concept of low-carbon circulation, ZTE is committed to constructing a "dual-circulation" model, and upholds the principles of reduction, reuse, remanufacturing, and recycling. We aim to extend the product lifecycle, reduce pollutant emissions, and lower the incineration and landfill rate, so as to realize an industry-leading low-carbon circulation. To that end, ZTE will continuously improve capabilities for the internal and external low-carbon circulation, with the goal of reducing the scrap rate by 25% and carbon emissions by 400 tons by the year 2030.



### Internal Circulation

ZTE strives to maximize the value of every material, continuously optimizes its internal circulation processes, and advances the digital transformation and intelligent manufacturing technology development. By reducing the product return volume and extending the product lifecycle, we effectively reduce scrap rate and lower carbon emissions.

**Coordinated market delivery:** ZTE has established an information sharing platform that integrates surplus products from the market into a shared resource pool. This effectively connects customers to maximize the utilization of products. From 2021 to 2023, we have achieved a 30% reduction in product returns.

**Remanufacturing:** ZTE reduces the purchase of new materials while maximizing material usage by incorporating returned materials as resources into the material requirements. Leveraging intelligent manufacturing technologies, we restore the functionality of returned materials, disassemble them down to components and raw materials for reuse. We also use various channels to extend the product lifecycle, for example, reselling the materials to customers, reusing the materials for R&D, engineering maintenance and repair, and exhibitions. In 2023, we achieved an annual reduction of 160 tons in carbon emissions.

### External Circulation

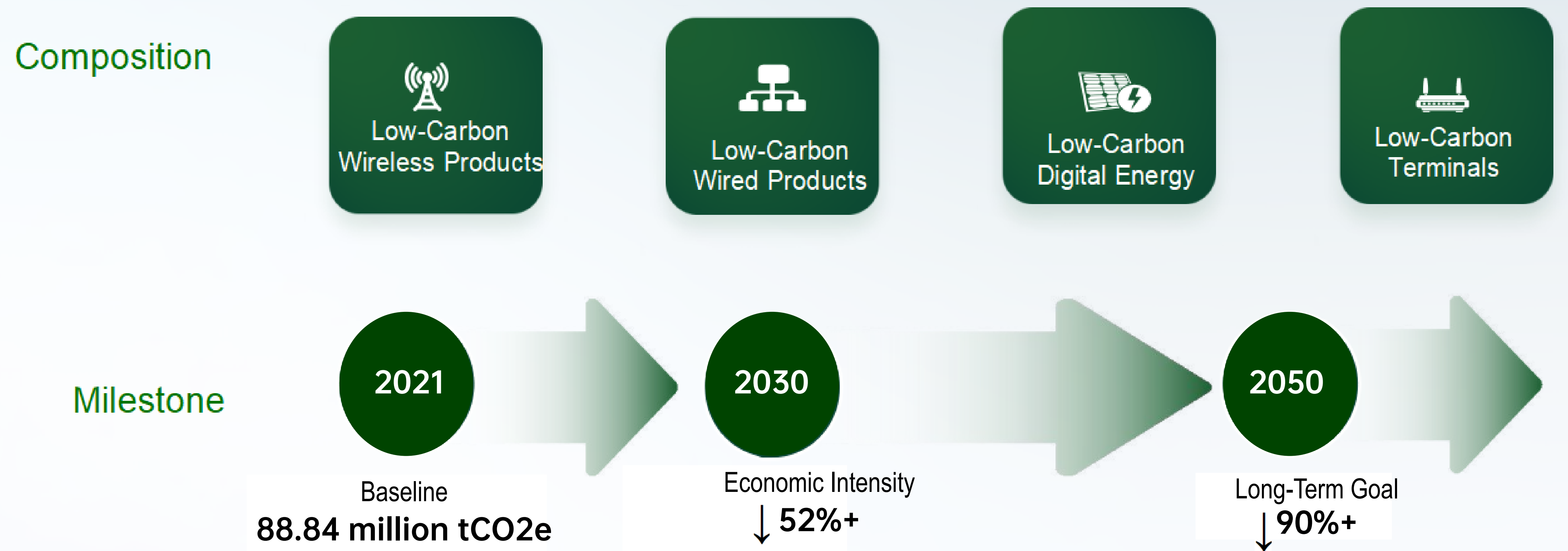
External circulation refers to the process of increasing the reuse rate of scrap materials and wastes, while reducing the incineration and landfill disposal at the end of the product lifecycle.

**Circulation for reuse:** ZTE prioritizes direct reuse in downstream processing, such as selling idle raw materials and components to parties in need.

**Disassembly for reuse:** ZTE continuously strengthens the environmental protection requirements for its partners, and works with leading enterprises in the industry. We establish strategic cooperation with the leading players in low-carbon recycling, and use new circular technologies to, for example, transform waste into construction materials. We also enhance the reuse rate of waste materials. For instance, we dismantle the core components of lithium batteries for reuse, with the goal of minimizing incineration and landfill disposal rates. Through these measures, ZTE successfully diverted approximately 10 tons of materials from incineration and landfilling in 2023.

## Green Digital Infrastructure

ZTE strives to enhance product energy efficiency and build low-carbon end-to-end ICT infrastructure, to provide a green digital foundation for industries and the society. Our product teams spare no effort to minimize the carbon footprint at every stage of the product lifecycle.

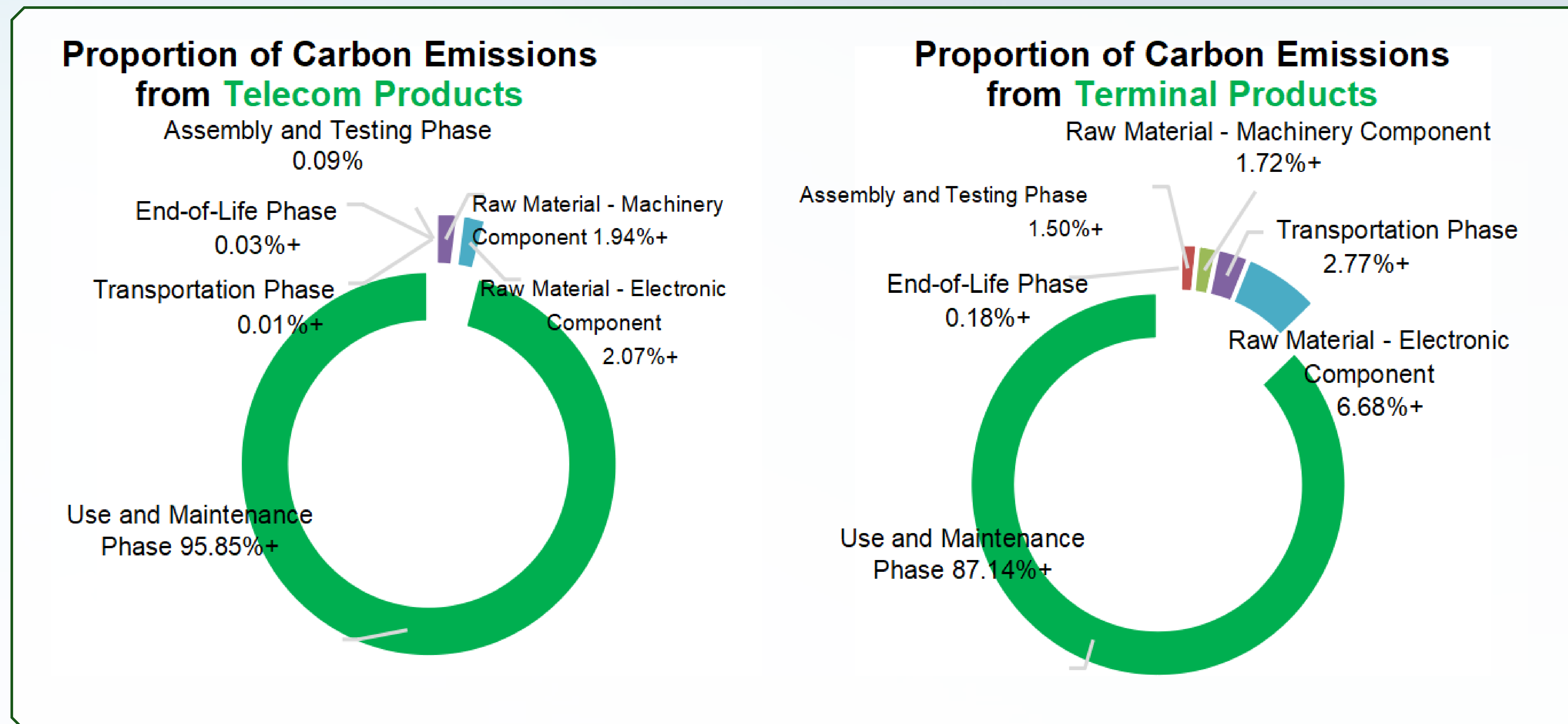


In 2021, the company has established the capability for Product Lifecycle Assessment (LCA), incorporated the GaBi software and database, which has been highly recognized internationally. ZTE strictly adhered to international standards such as ISO 14040 Environmental management — Life cycle assessment — Principles and framework, ISO 14044 Environmental management — Life cycle assessment — Requirements and guidelines, and ISO 14067 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification. Based on these international standards, an expert team has been formed to conduct carbon footprint assessments for all categories of the company's products.

By the end of 2023, ZTE has conducted carbon footprint assessment on over 100 products, which covered all product categories of the company.

Focusing on the environmental performance of products throughout their lifecycles, ZTE has formulated a series of regulations, such as the *Technical Requirements for Product Energy Consumption Reduction*, *Technical Requirements for Carbon Reduction of Mobile Devices*, and *Product LCA Carbon Footprint Assessment Specifications*. In addition, the company has embedded LCA requirements into the R&D process, and added assessment methods for product end-of-life phase and Product LCA Carbon Footprint Assessment Data List. In this way, ZTE aims to reduce carbon emissions from the source.

ZTE offers a diverse range of products that can be classified according to their functionalities: wireless products, wired products, digital energy products, and terminal products. By analyzing the carbon emission proportions throughout the entire lifecycle of the company's various product categories, it is found that carbon emissions resulting from electricity consumption during the use and maintenance phases generally account for more than 85%, and even up to 95%. Consequently, improving power efficiency becomes the key focus of the company's carbon reduction efforts for its products.



Carbon Emission Proportion in the Product Lifecycle

From 2021 to 2023, the physical intensity of carbon emissions in the use phase of sold telecom products fell by more than 14% each year.

### Low-Carbon Wireless Product

To reduce carbon emissions of wireless products, ZTE develops and uses new power-saving chipsets and shifts from air-cooled to liquid-cooled technology architecture.

**1) Low-power consuming RRU:** Based on the new D42 digital intermediate-frequency chips and MTS1.0/2.0 transceiver chips, along with the innovative SUPER-N power amplifier architecture offering the highest efficiency in the industry, we have significantly improved the overall efficiency of the D42-series RRU products. The power consumption of our products is 10-20% lower than that of the industry average. As such, we have developed products featuring the lowest power consumption and weight, smallest size, and simplest site deployment. This has enabled us to establish the UBR product family with the highest competitiveness and the most comprehensive specifications in the industry.

**2) Liquid-cooled servers:** ZTE's full range of servers include both GPU servers and liquid cooled servers, enabling the construction of computing resource pools for large models with minimal energy consumption. The R5300G4X server employs liquid cooling technology, which leverages the high thermal conductivity and heat capacity of liquids to break through the heat dissipation limits of air cooling. It can address the cooling bottlenecks of high-power and high-density equipment, reducing the energy consumption of the liquid cooling system. The cold plate liquid-cooled server can adopt the architecture of air-cooled servers, compatible with air cooling for ultra-low noise. It can reduce the power consumption of device fans by 80% and noise by approximately 15 dB. Meanwhile, liquid-cooled servers offer high heat dissipation power density, enabling a 2 to 5 times increase in the utilization of data center space. The PUE of the data center is reduced to below 1.13.

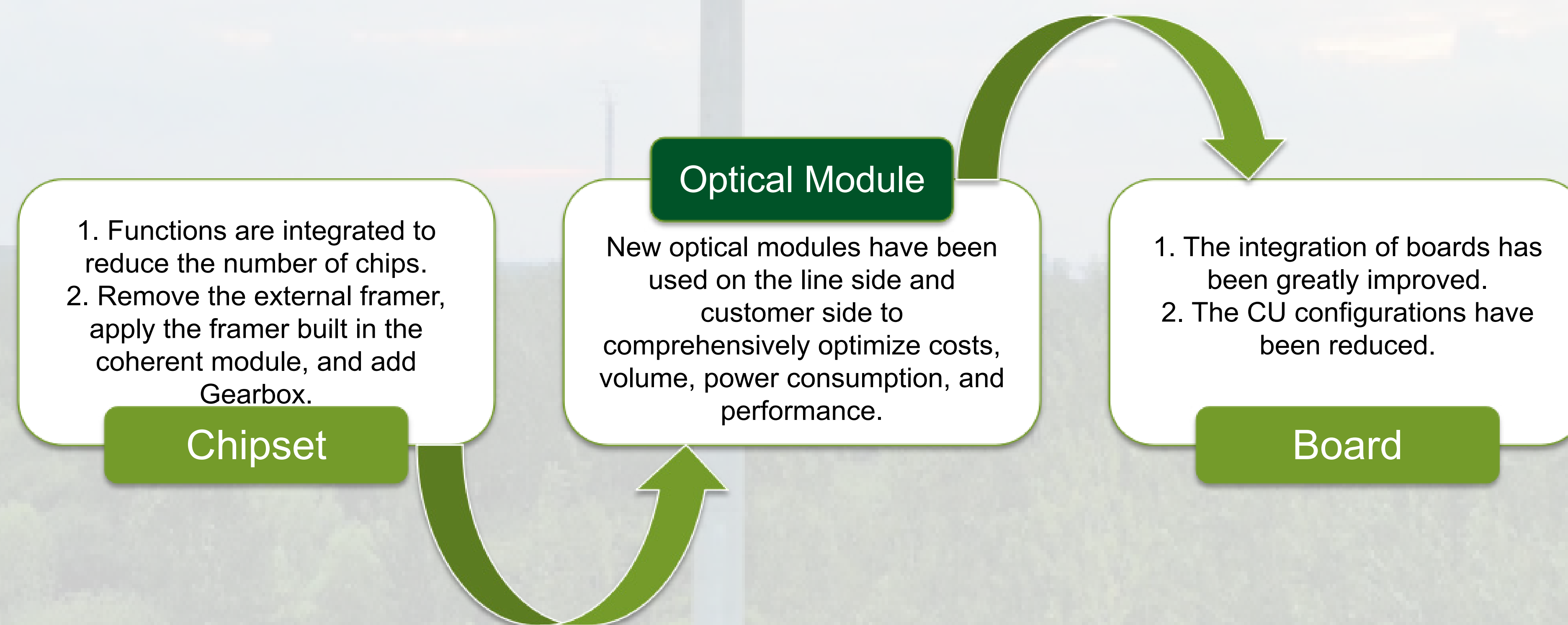


RRU and Server Featuring Low Power Consumption

## Low-Carbon Wired Products

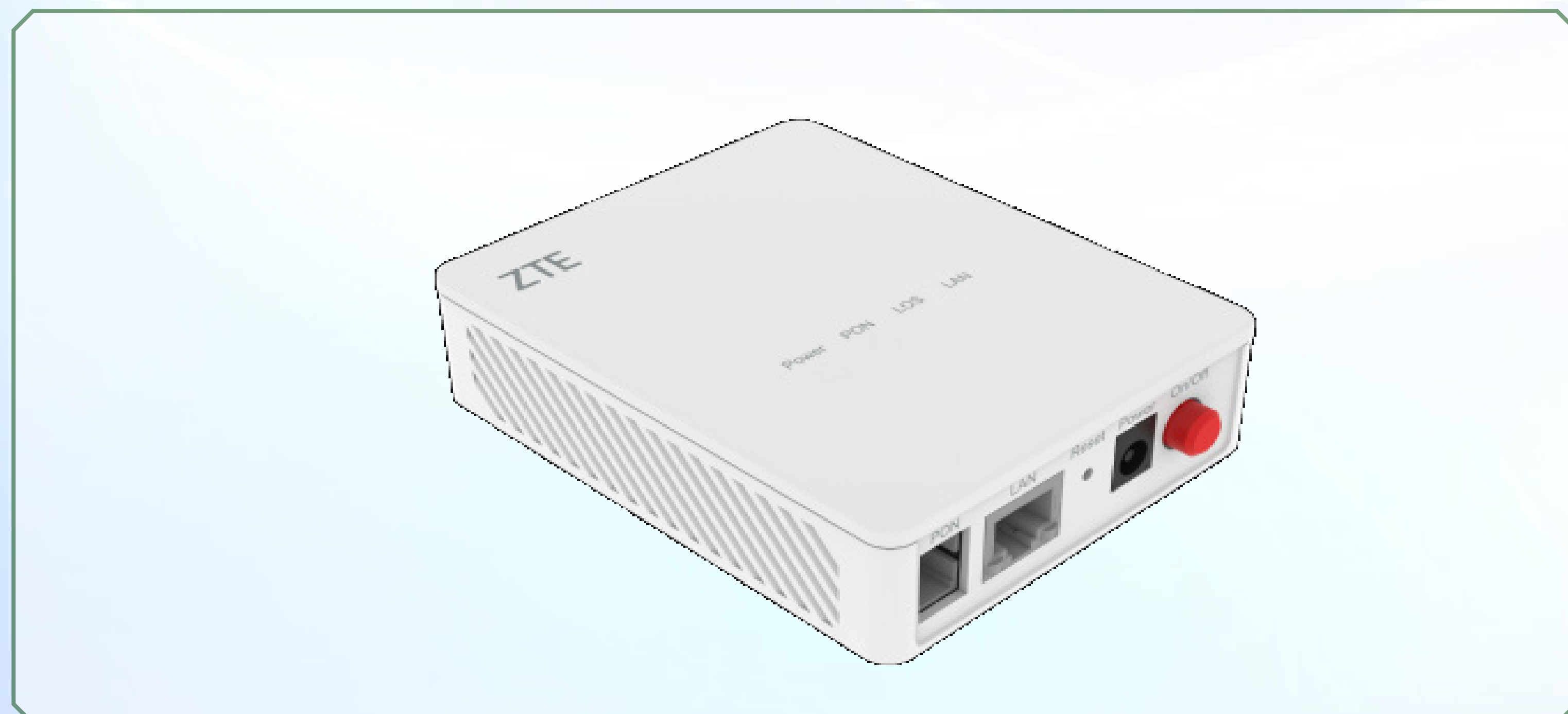
To reduce emissions of wired products, ZTE develops and uses power-saving chips and optimizes the product architecture.

**1) OTN products:** By optimizing the product architecture, the former combination of the customer-side optical module + Framer + line-side optical module for the tributary-line-integrated boards has been upgraded to the customer-side optical module + CDR + line-side optical module, reducing the power consumption per Gbit. The power consumption of convergence boards has been reduced from 110 W to 70 W, and that per Gbit has been decreased by 36%. After the framer is removed, convergence boards are equipped with a single slot instead of dual slots, and the number of subracks drops from 14 to 7. The total power consumption thus decreases from 10,900 W to 6,650 W, and the power consumption per Gbit is cut by 39%, saving a total of 37, 230 kWh annually.



Energy Conservation of OTN Products

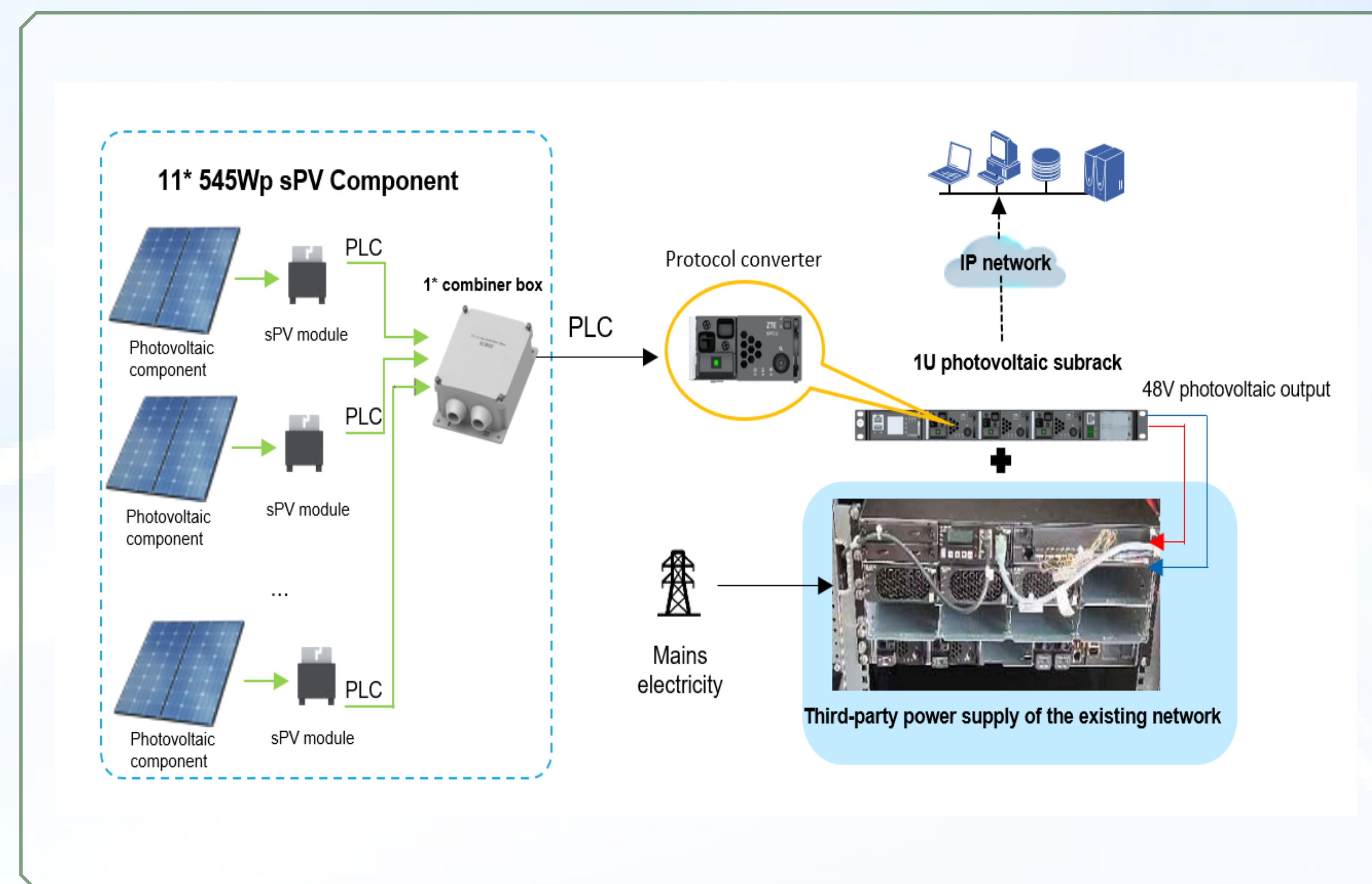
**2) PON ONU products:** SoCs and WiFi chips together account for about 70% of the power consumption of home information terminals, apart from other chips with relatively small consumption. In terms of SoCs, ZTE continuously improves the process and energy-conservation mechanism of in-house SoCs. For example, dynamic CPU frequency reduction is supported, independent power switching is enabled for each CPU core through power gating control, and the CPU can be woken up through GIC, expanding the data processing bandwidth by ten times and decreasing the chip power consumption by 35%. As for WiFi chips, the energy-conservation mechanism can identify different scenarios and respond accordingly. Specifically, it reduces the number of transmitting antennas in low-traffic scenarios, and actively controls the transmit power in accordance with the link attenuation in high-traffic scenarios, effectively reducing the power consumption by 26%. Also, the gigabit Ethernet PHY developed by ZTE makes green Ethernet a reality. It enables the Low Power Idle (LPI) mode of the Energy-Efficient Ethernet (EEE) and self-defined low power consumption. The PHY can detect the cable length; and if a short-distance application scenario is involved, the output power can be decreased, further reducing the Ethernet power consumption by 30%. Through the energy-conservation measures, ZTE's PON ONU products help save 372 million kWh per year, with the same impact as planting 20 million trees annually.



## Low-Carbon Digital Energy Products

To reduce emissions of digital energy products, ZTE uses site photovoltaic applications and lowers the PUE of data centers via liquid-cooling technologies.

Site photovoltaic applications: With the anti-shading function in the smart Photovoltaic (sPV) solution, ZTE's power products realize efficient power generation and boast unique advantages such as intelligent O&M. In practice, ZTE is carrying out a site photovoltaic project for A1 Bulgaria. The 104 sites that have been delivered in the first year are expected to generate solar power of 830,000 kWh per year, helping the customer save over USD180,000 in electricity fees every year and reduce emissions by over 827 tons annually. It is estimated that, after project completion, all the 500 sites or so will generate solar power of 3.99 million kWh per year, helping the customer save over USD860,000 in electricity fees every year and reduce annual emissions by over 3,975 tons.



Power Products for Site Photovoltaic Applications

**End-to-end liquid-cooled Data Center (DC):** ZTE unveiled its next-generation end-to-end liquid-cooled DC solution at the "Light of Internet" Expo of 2023 World Internet Conference. By enabling green energy conservation, fast and easy deployment, smart management, and great security and reliability, the solution can help build high-quality DCs, thereby promoting global sustainable development. In the solution, ZTE uses the legacy water-cooled system and indirect evaporative cooling system to build a primary side of the liquid-cooled system. In addition, the "liquid cooled + air cooled" mode improves cooling efficiency, and reduces the overall PUE to as low as 1.13, meeting the cooling needs of high-power equipment for intelligent computing while effectively lowering costs.



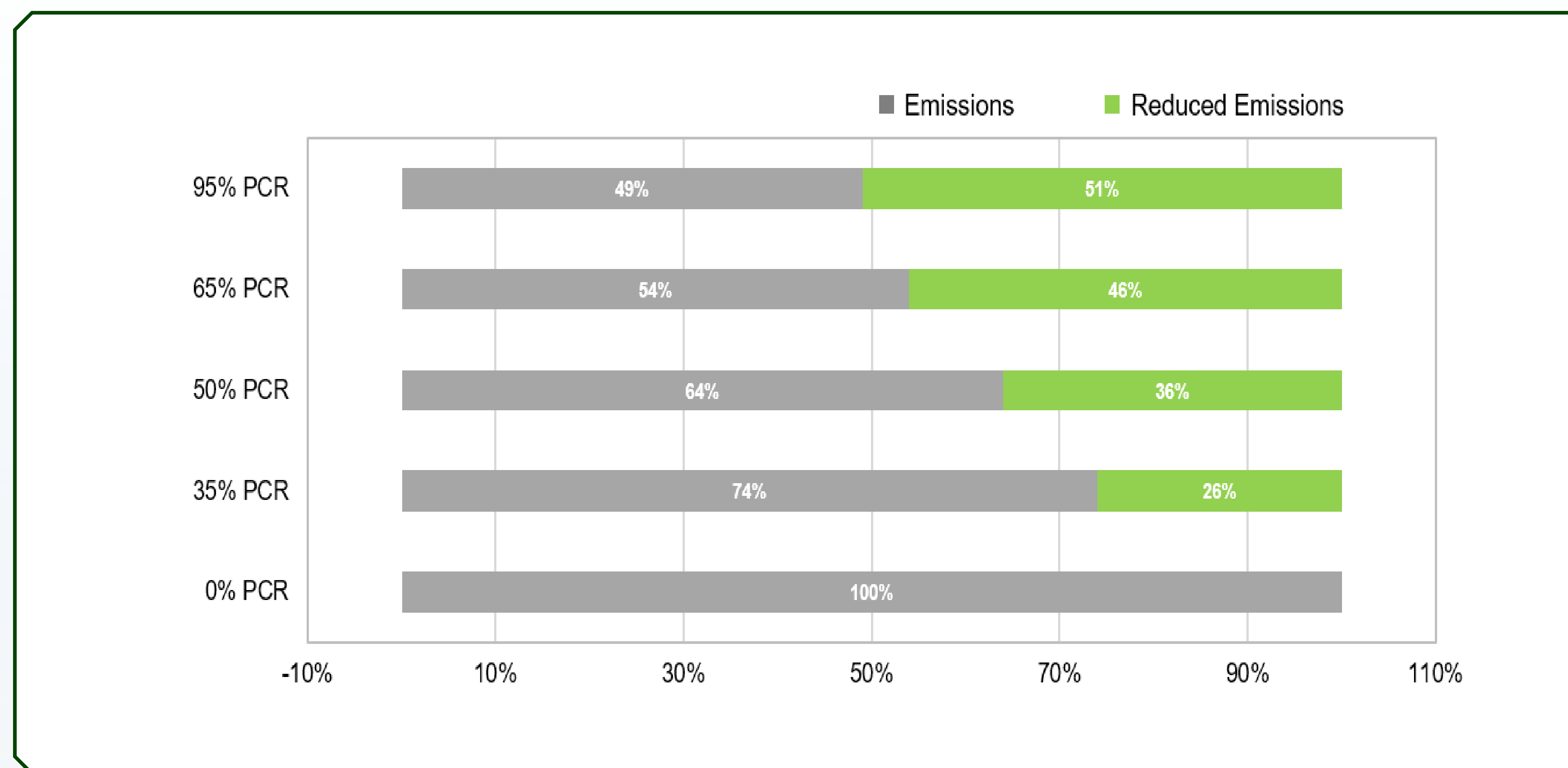
End-to-End Liquid-Cooled DC

## Low-Carbon Terminals

In addition to improving energy efficiency of terminals, ZTE attaches importance to controlling the emissions from different product materials and components. To this end, the company uses PCR materials as raw materials and promotes the weight reduction of materials.

**Use of PCR materials:** PCR materials are used in the plastic structural components of CPE products, based on the product features, customer requirements, and the company's emission reduction requirements. In addition, product design is optimized to enhance material strength, with all the test results meeting the customer's and the company's requirements.

**Material weight reduction design:** PCR materials are used to the maximum extent while ensuring the mechanical strength performance of materials. At present, those materials account for over 95% in the shell materials of terminals, reducing emissions from shell materials by over 50%, and contributing to 3% of emission reduction in the full product lifecycle. Currently, the PCR materials have been widely used in models sold in Europe.



## Green Empowerment of Industries

Digital solutions can significantly improve business efficiency and resource utilization, yielding green and low-carbon benefits and empowering the green development of industries. According to the Global e-Sustainability Initiative (GeSI), ICT has the potential to slash global greenhouse gas (GHG) emissions by 20% by 2030, nearly ten times greater than the emissions generated by the ICT sector itself.

As a leading provider of integrated ICT solutions, ZTE continuously explores the key scenarios of digital life to create new value and empowers digital transformation through effective solutions, solving the pain points in public life and industrial development, stimulating new quality productive forces in multiple fields, and bringing new momentum for high-quality development. By introducing advanced technologies such as cloud and network infrastructure, Internet of Things, big data, and AI to traditional industries, the company unlocks the data value of all fields, increases the productivity across processes, and reduces end-to-end energy consumption, realizing a win-win between business development and emission reduction.





By continuously combining its capabilities with those of industrial partners, ZTE has provided digital transformation solutions for nearly 1,000 customers in mining, metallurgy, steel, transportation, energy, power, and water conservancy, accelerating the fulfillment of goals related to energy conservation and emission reduction.

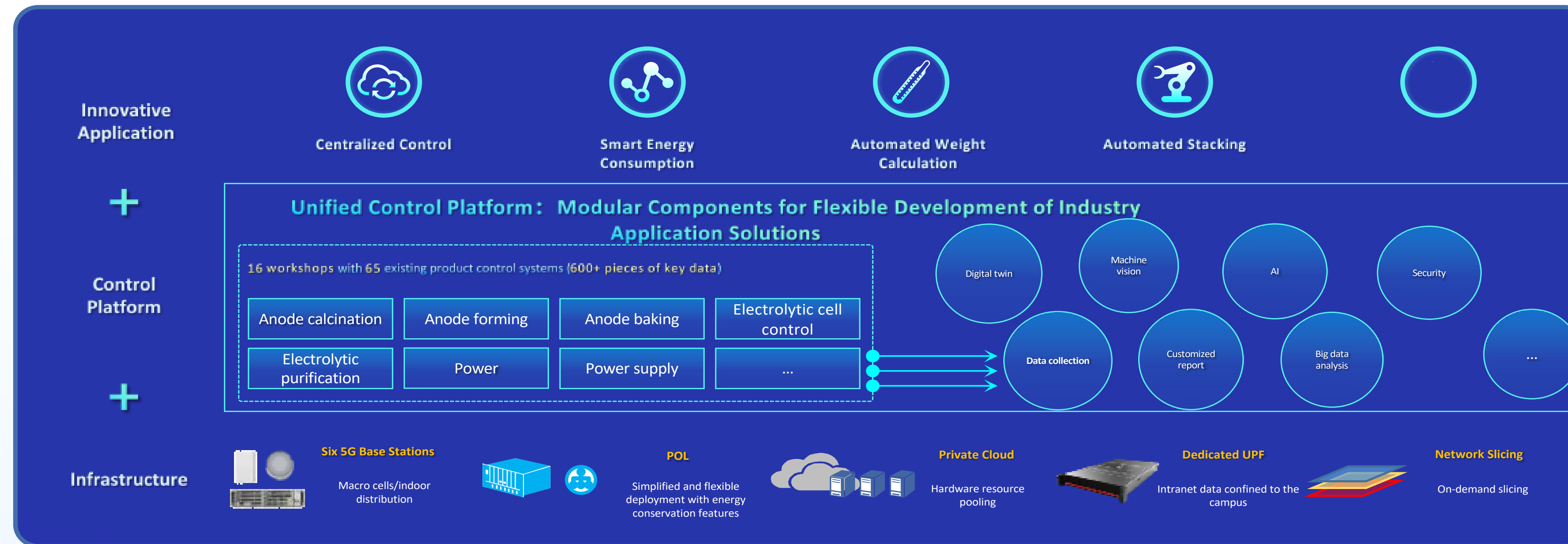
## Energy Conservation and Emission Reduction in 5G Smart Smelters

Qingtongxia Aluminum Industry Co., Ltd. (hereinafter referred to as "Qingtongxia") is a subsidiary of SPIC Ningxia Energy Aluminum Co., Ltd., one of the top 500 enterprises in China. Its core business covers electrolytic aluminum, anode carbon blocks, and cast aluminum. Qingtongxia has an annual production capacity of 430,000 tons of aluminum and 260,000 tons of carbon products, ranking among the top aluminum electrolytic producers in China.



5G Smart Smelter at Qingtongxia

The original 65 production control systems of Qingtongxia were distributed across 16 workshops, and the data was not shared between upstream and downstream processes, resulting in data silos. In addition, the original production environment, including such hazardous factors as high temperature and magnetic field, posed high safety risks, and thus workers must wear protective clothing. Also, Qingtongxia's power consumption was large, with its annual power consumption reaching about 6.2 billion kWh, and its daily power consumption hitting 16.99 million kWh (equivalent to the annual consumption of one Chinese county).



Moreover, Qingtongxia's 500 meters, including water, electricity, and natural gas meters, were outdated and scattered and could not automatically upload data. As a result, the technical personnel had to regularly read the meters, and then record the data into the legacy energy management and control system for manual statistics, causing huge labor investments and low work efficiency. In such situation, it was impossible to accurately know the energy consumption status in real time, promptly discover potential problems, and effectively conserve energy.

After the building of the 5G smart smelter, Qingtongxia now can monitor the energy consumption status in real time, thereby tapping into the potential for energy conservation. Specifically, the data collection terminals are interconnected with the system to automatically read and collect meter data in real time, thereby greatly improving data timeliness. For meters that do not support data collection through standard interfaces, AI machine vision is used to accurately read meter values, avoiding manual errors and improving collection accuracy.

Besides, based on the analysis of energy consumption data and the thresholds set, alarms are raised for abnormal energy usage in real time to help conserve energy and reduce consumption. Based on collected data, digital technologies are used to control energy consumption in real time and provide support for adjusting energy use policies.



5G-Based Energy Consumption Data Collection and Back-End Data Monitoring and Analysis

Based on ZTE Digital Nebula, the 5G smart smelter helps conserve energy and reduce emissions from the following aspects:

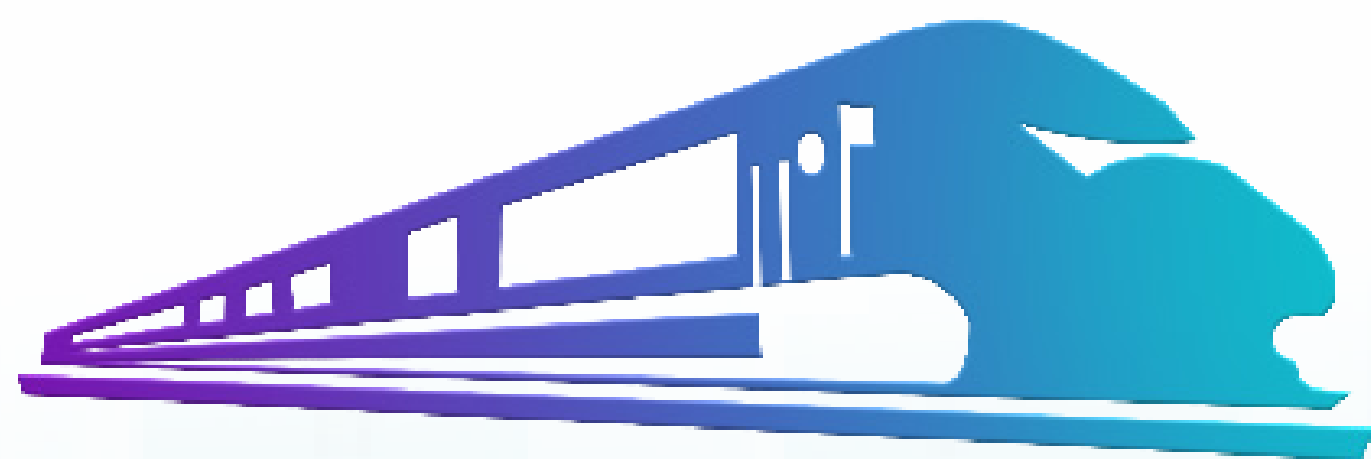
**Centralized production control:** All process data of the entire factory is aggregated in real time; without changing the original meters, AI machine vision is used to automatically collect the data, not affecting production while raising the data collection accuracy to more than 90%.

**Cost reduction and efficiency increase:** Meters are automatically read, saving up to 70% of manpower for reading and recording data.

**Delicacy management:** Digital and intelligent management is implemented, boosting the scheduling and control efficiency by 30%.

Together with China Mobile Ningxia Branch, ZTE promoted the digital transformation of Qingtongxia and the development of the 5G industrial Internet. With intelligent production control and innovations in the industrial Internet platform, intelligent energy management has been achieved. Through energy monitoring and analysis, Qingtongxia has taken targeted measures to conserve energy, saving 5.6 million kWh annually and reducing carbon emissions by about 5,100 tons.

## Cloud Platform Helping the Urban Rail Transit Industry Go Green

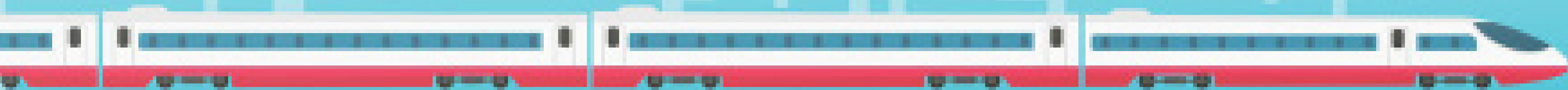


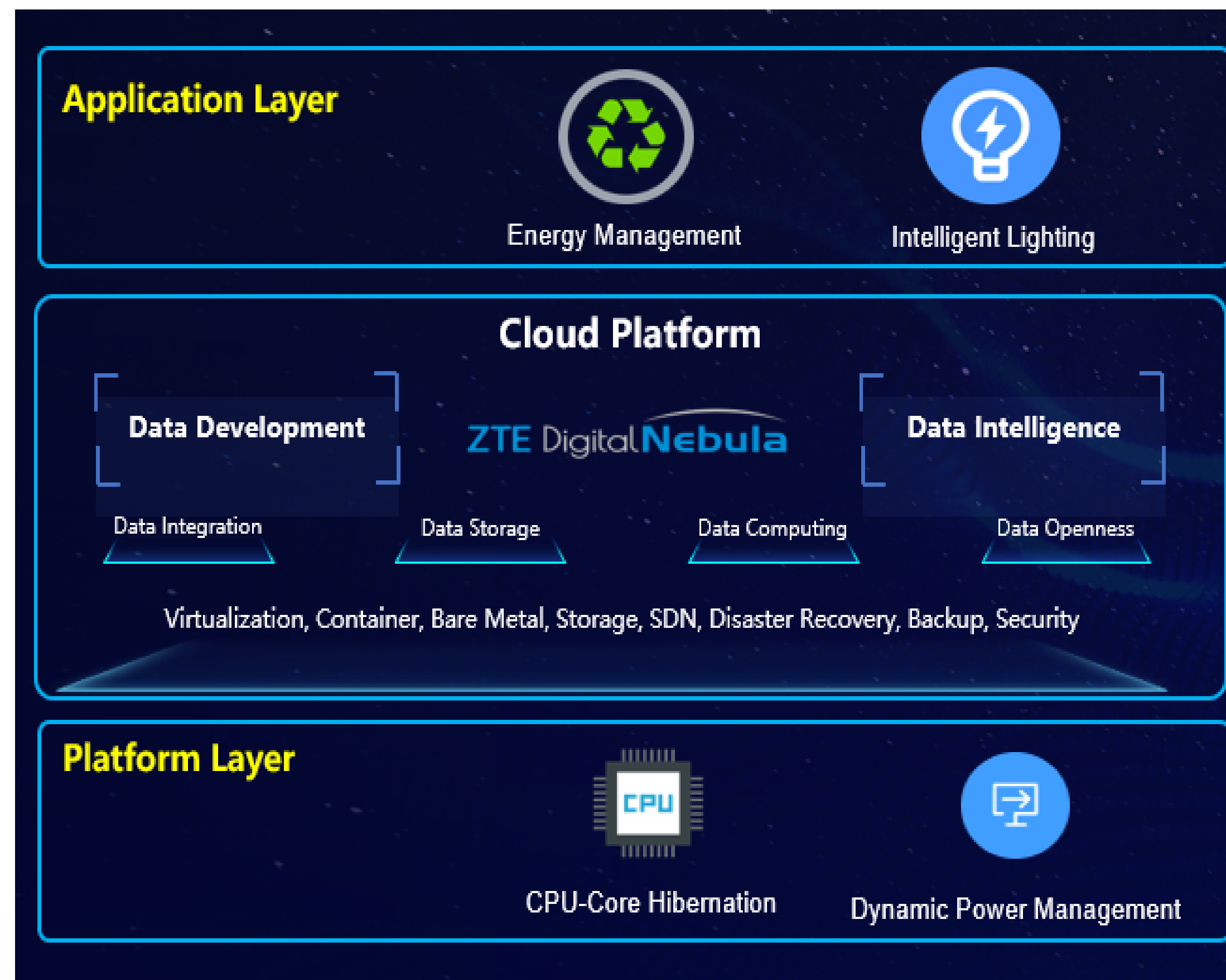
The urban rail transit industry is speeding up its evolution towards intelligent and green operations, requiring the deep integration of new information technologies with urban rail services. Given the high usage of the services, effective reduction of energy consumption has become a challenge.

ZTE has built an intelligent, efficient, and scalable urban rail transit cloud platform for Qingdao Metro, based on an on-demand architecture that is easy to manage, dynamic, efficient, stable, and reliable. This platform enables "one-stop" management of heterogeneous cloud, network, and terminal resources, fully supporting the metro service and meeting the needs for safety, performance, online information interaction, and energy conservation.

With low-carbon and energy conservation technologies, the cloud platform helps build a green urban rail transit system. For example, with advanced technologies such as CPU-core hibernation and dynamic power management the energy consumed by servers was saved by over 30% during onsite verification.

Also, based on the cloud platform, an intelligent energy management system has been built. It enables dynamic monitoring, analysis, and comparison of the energy consumption data across the transit system, so that the staff can grasp the energy usage status and control unnecessary power consumption to save energy and reduce consumption. After the system was put into operations, it was verified that the energy used by stations was saved by 5%. Furthermore, an intelligent lighting system was established. As such, different lighting levels can be set accurately in accordance with time and environmental changes, saving over 50% in power usage compared with the former lighting method.





### Energy Saving Technologies

Powered by ZTE Digital Nebula, the cloud platform enables unified management of the urban rail transit service, breaking down data silos and effectively supporting the construction of smart metros. Based on the cloud platform, Qingdao Metro is establishing an intelligent energy management system for energy consumption monitoring and control across metro lines, so as to comprehensively enhance the intelligent decision making on energy management. In 2023, Qingdao Metro witnessed a 5.6% drop in its overall energy consumption. It is estimated that, after all the systems are built, 39.5 million kWh of power will be saved and 39,500 tons of carbon emissions will be reduced.



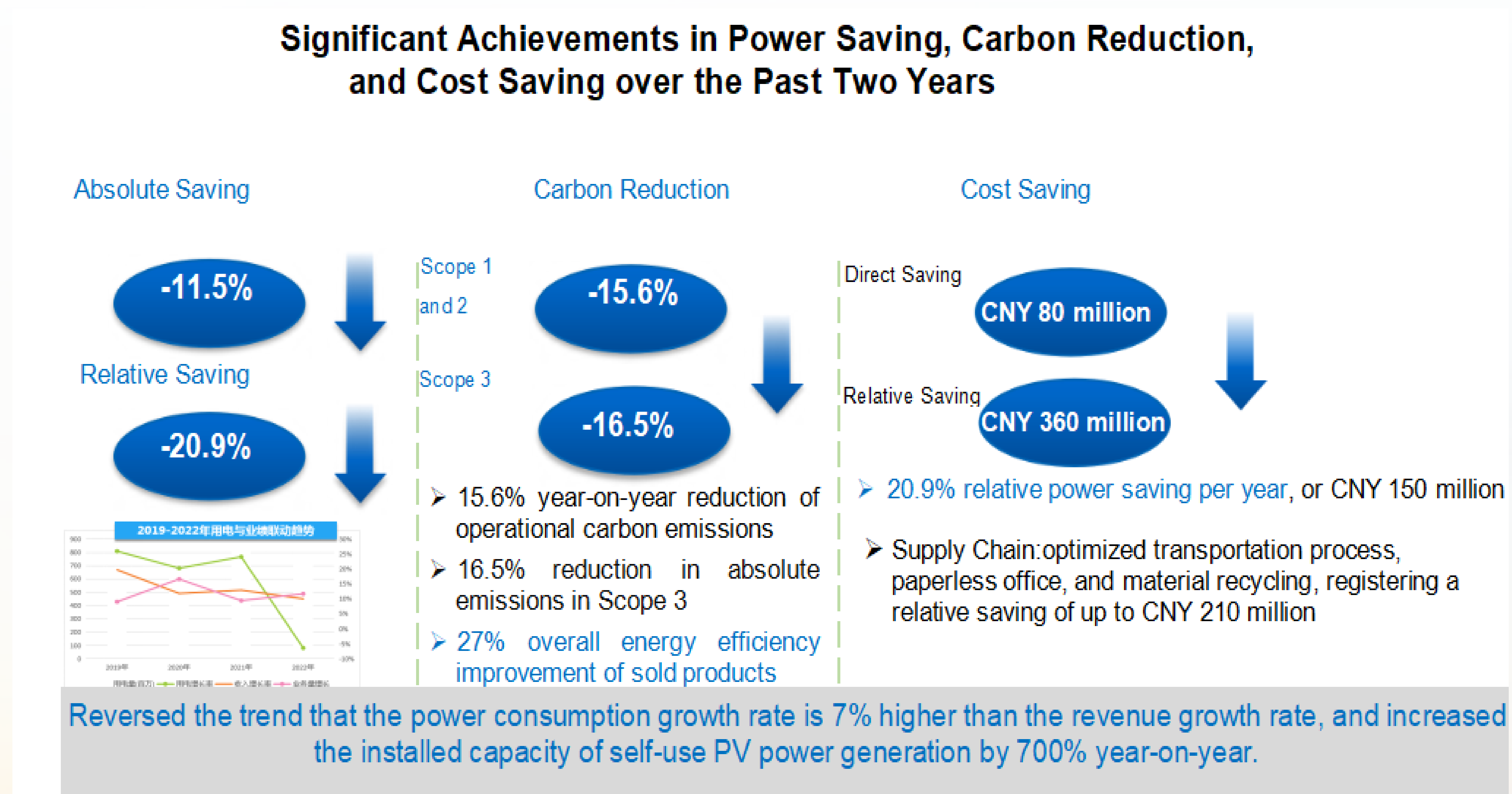
# 06

## Achievements and Honors

Thanks to its leading practices and contributions to green operations and emission reduction, such as developing green strategies, advocating a green culture, attaching importance to both managerial and technical measures, and empowering the green growth of industries", ZTE has won multiple national-level awards in China, and gained recognition from international authoritative non-profit environmental organizations, such as the Carbon Disclosure Project (CDP).



## Key Indicators



## Social Contribution

By the end of 2023, ZTE had deployed more than 2 million intelligent power systems globally, with 360,000 lithium batteries and an installed solar energy capacity of over 400 MW, building a solid foundation for operators in low-carbon transformation and thus gaining extensive recognition.

Thanks to the company's continuous efforts, the average carbon emissions of new ZTE 5G products in a single site decreased by more than 40% to 50% compared with the models put into commercial use in 2019. Also, in August 2022, the Ministry of Industry and Information Technology of China announced that the energy consumption of a single site of the national 5G network had been reduced by more than 20% compared with the early stage of 5G commercial use. This should be attributed to the concerted efforts by all parties, including the substantive contributions of ZTE.

ZTE has worked with partners to explore over 100 innovative 5G application scenarios across 15 industries in China, including manufacturing, transportation, power, and environmental protection. Globally, those efforts extend to factories in Thailand, ports in Belgium, and farms in Austria. Through continuous digital empowerment focused on "cost reduction, efficiency improvement, and quality enhancement," the company drives the digital transformation, energy conservation, and emission reduction across numerous industries.

## Certifications and Honors

ZTE's achievements in carbon reduction can be evidenced by the following certifications and awards:

- ✔ 2021–2023: ISO 14604 Greenhouse Gas Verification Statement from SGS
- ✔ 2020: Green Product Certification for three series of intelligent network switches issued by the China Quality Certification Center
- ✔ 2021: ZTE's PowerPilot energy-conservation solution was chosen as "a Pioneer in Pursuing the Carbon Peaking and Carbon Neutrality Goals" in the "2021 ICT Excellent Cases" organized by the People's Post & Telecommunications News.
- ✔ 2022: ZTE's PowerMaster hybrid energy solution won the "2021 Innovative Technology Solution for Carbon Peaking and Carbon Neutrality" awarded by China Energy News.
- ✔ 2023: "ZTE Innovative Green Supply Chain" was awarded the "2022 Top 30 Enterprises in Supply Chain Digitalization and Carbon Neutrality Solution" by the China Logistics Supply Chain League and the Organizing Committee of the Supply Chain China Modernization Forum.
- ✔ 2023: ZTE was included on the CDP Climate Change A List, received the Climate Change Leadership Award, and was given the title of "Supplier Participation Leader".
- ✔ 2023: ZTE won the Excellence Award in the first "New Green Cup" Innovation Competition for Empowering Carbon Peaking and Carbon Neutrality in the Information and Communications Industry with its "PUE Online Renovation Project for Aging Data Centers and Communication Buildings of Guangxi Mobile".



2023: ZTE won the titles of "National Green Supply Chain Management Enterprise" and "National Green Factory".

# 07

## Summary and Outlook

Going green is the foundation of high-quality development, and new quality productivity forces represent green productivity in essence. Innovations in data and information technology effectively promote the green transformation and upgrade of development models, facilitating the achievement of dual carbon goals.





Guided by China's green development philosophy and the company's "Green Digital Path" strategy, ZTE actively implements a range of emission reduction measures driven by technological innovations. These measures, which span the entire carbon lifecycle, have yielded significant achievements across the company's operations, supplier ecosystems, digital infrastructure development, and industry empowerment. In 2024, ZTE's science-based targets received official approval from the SBTi, underscoring the company's commitment to global sustainable development and its mission to continuously promote emission reduction. Looking ahead, ZTE will adhere to the principles of "tech for good" and "long-term development", striving to build a greener future for humanity.

The path to success is often fraught with challenges. The experiences of the past highlight our growth, while the lessons learned guide our future actions. "Going green" should be more than a catchy slogan; it requires consistent, correct actions from everyone. Looking into the future, ZTE will fully honor its commitments to green development. Specifically, we will continuously explore technical and managerial measures for energy conservation in corporate operations to speed up the green transformation of suppliers. The company will also advance the application of emission reduction tools in various scenarios, such as green power transactions and certifications, internal carbon pricing, carbon offsetting, removal, inclusion, and insetting, as well as green finance. In addition, we will actively expand green and low-carbon services, invest in industries related to new renewable energy, digital energy, and Carbon Capture, Utilization, and Storage (CCUS) technologies, achieving high-quality development while contributing to social progress.

As global industries are entering a critical stage of green transformation, more companies have recognized the necessity and importance of green development, and taken multiple measures to reduce emissions, for example, emissions measurement, goal management, energy consumption reduction, supply chain decarbonization, renewable energy adoption, and carbon offsetting. The ICT sector, which plays a vital role in supporting green development, is empowering industries that requires high energy efficiency, such as the Industrial Internet, Energy Internet, and Internet of Vehicles. Engaging in the ICT sector for 39 years, ZTE aims to leverage its technological innovations and practical expertise to build an intelligent ecosystem jointly with global telecom operators and industry partners. Together, we will drive industry innovations and enhance operational efficiency with cutting-edge technologies, foster high-quality growth through new quality productive forces, and contribute to energy conservation and emission reduction, adding a green touch to our shared future.

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# Toward Green with Digital Innovation