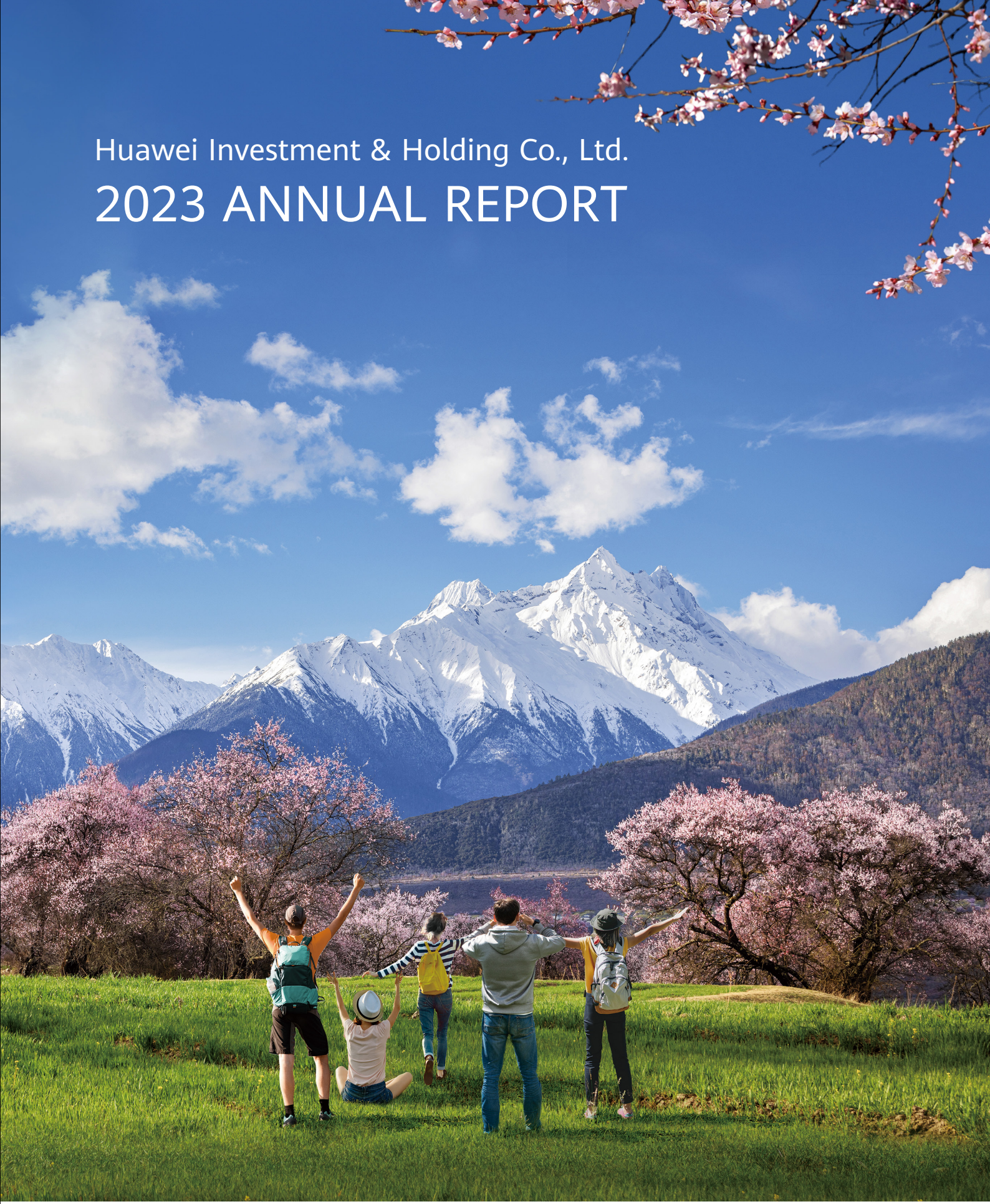
Huawei Investment & Holding Co., Ltd.

2023 ANNUAL REPORT



Building a Fully Connected,
Intelligent World

HUAWEI

Who is Huawei?

Founded in 1987, Huawei is a leading global provider of information and communications technology (ICT) infrastructure and smart devices. We have approximately 207,000 employees and we operate in over 170 countries and regions, serving more than three billion people around the world. We are committed to bringing digital to every person, home and organization for a fully connected, intelligent world.

Walking the walk for steady, long-term growth

Laying the groundwork for an intelligent world

In 2023, we witnessed rapid advancement in emerging technologies like artificial intelligence (AI) and nonstop innovation in new applications for business. AI development has evolved from customization on a small scale to massive application at an industrial level, while digital technology has become more deeply integrated with every aspect of our lives. This digital and intelligent transformation is bringing new value to individuals and breathing new life into enterprises. We want to help all industries make the most of these new developments. So we are leveraging the collective strengths of our business portfolio, backed by a solid grasp on complex hardware and software platforms, to build a solid foundation for a digital and intelligent world.

Delving deep into basic research and driving technological innovation

Huawei values research and innovation, and we take an open approach to both. We continue to delve deep into basic scientific and theoretical research, and are working closely with academia and the industry to push innovation forward. Together with our customers and partners, we are pushing the limits of technology to address broader industry challenges. We also develop innovative products and solutions to address the unique problems our customers face. We want to create greater value for the world.

For the past three years, we have invested more than 20% of our annual sales revenue back into research and development. Our aim is to drive industry development to help pave the way for the imminent arrival of an intelligent world – one with 100 billion connections and a universal 10 gigabit experience.

Prioritizing security and trustworthiness, succeeding through quality

Cyber security and privacy protection are Huawei's top priorities. We continue to build up and improve on our end-to-end cyber security assurance system, embedding cyber security requirements into all aspects of our operations, including policy, management, and technology. Through industry exchange and international cooperation, we also share best practices and work

with stakeholders to build a secure, trustworthy, and intelligent world. Our efforts have earned worldwide recognition, and we continue to maintain a solid track record in cyber security in over 170 markets around the world. Customer trust is the most solid testament to the security of our products and services.

Quality is our path to success. Over more than three decades in the ICT domain, we have built up significant capabilities and experience in quality management and are adapting this experience to meet the needs of new business domains. We are also sharing these capabilities with our suppliers, channel partners, and other partners. Through end-to-end quality management systems, we provide our customers with more competitive products and solutions.

Building up thriving ecosystems for a more dynamic industry
Digital, intelligent, and low-carbon transformation will continue to be major development trends moving forward. We will continue to maintain strategic focus while supporting free trade, open markets, and fair competition. We are committed to driving healthy industry development and creating value for our customers, partners, and the world. To make this happen, we are working to promote a more open, diverse, and inclusive ecosystem.

We value openness and collaboration and work hard to help others succeed. In particular, we are actively developing platform capabilities for ecosystem-centric domains like HarmonyOS, Kunpeng, Ascend, and cloud computing, and we are combining strengths across the industry to promote the development of business ecosystems. By enabling ecosystem partners and enhancing experience for developers, we hope to stimulate innovation and drive shared success.

Powering sustainable development with technology
We use advanced ICT solutions to help industries reduce their carbon emissions and accelerate the construction of new energy infrastructure. This is part of our broader efforts to foster a more circular economy and maximize the value of digital technology in powering green development.

We do our best to give back, and hope to make the intelligent world a more inclusive, sustainable place. In particular, we are using technology like broadband, cloud, and AI to promote equitable and quality education, environmental protection, and balanced development. We have also expanded our talent development program – Seeds for the Future – to help foster the next generation of digital talent. Through this program, we are nurturing digital leadership, helping young people build digital skills, and upskilling ICT professionals. To date, this program has benefited more than 3.4 million people from around the world.

Contents

Message from the Rotating Chairman

We've been through a lot over the past few years. But through one challenge after another, we've managed to grow.

We rounded off 2023 with CNY704.2 billion in revenue. Our ICT infrastructure business remained solid, and our consumer business met expectations. Both our cloud computing and digital power businesses grew steadily, and our intelligent automotive solution business began large-scale delivery.

The trust and support of our customers, partners, and friends around the world is what helped us keep going, keep surviving, and keep growing. On behalf of Huawei, I'd like to extend our heartfelt gratitude to everyone for your ongoing support.

Throughout the past year, the entire team at Huawei has been forging ahead, working closely with partners to drive shared success and create value for our customers.

In the ICT infrastructure domain, we worked side-by-side with our carrier customers to maximize returns on their 5G network investment and steadily advance the commercial deployment of 5.5G.

In the enterprise domain, we differentiated our products, portfolios, and industry solutions based on the unique needs of different types of customers, including named accounts, SMEs, and MSMEs.

In the consumer domain, the HUAWEI Mate 60 Series and the HarmonyOS ecosystem received wide acclaim.

In cloud computing, we moved ahead with our AI for Industries strategy. We launched innovative products like our Pangu Models 3.0 and Ascend AI cloud service, which are designed to provide all industries with a solid cloud foundation for going digital.

In the energy domain, Huawei Digital Power continues to use digital technology to help power the world's green and low-carbon development. In 2023, we made tremendous progress in areas like smart PVs and liquid-cooled ultra-fast charging.

And in the automotive domain, our solutions like intelligent driving and intelligent cockpits saw large-scale adoption in a growing number of automotive brands.

Open innovation for an intelligent world

In today's world, emerging technologies progress by leaps and bounds, with nonstop innovation in new business applications. AI models have moved beyond small-scale customization and are now seeing massive development on an industrial level. Looking ahead, it's clear that digitalization, intelligence, and decarbonation are the path forward. An intelligent world is coming fast, and it will bring countless new opportunities for the ICT industry.

Open innovation is critical for social development and technological progress, and it's built into Huawei's very DNA. We are actively working with other industry players and academia to advance technology and help different industries modernize.

Huawei has built up an extensive range of ICT technologies, and we will continue to invest heavily in R&D while strengthening strategic synergy across hardware, software, chips, devices, networks, and cloud.

Despite a number of immense challenges over the past three years, we continue to innovate based on two core drivers: science and technology, and customer needs. Throughout this time, we have invested over 20% of our annual revenue back into R&D to ensure the competitiveness of our products and solutions.

To meet industry demand for green transition, for example, we recently launched a "0 Bit 0 Watt" wireless solution, which helps carriers strike the optimal balance between mobile network experience and energy consumption.

Huawei Cloud's Pangu-Weather model is another great example. Featured in *Nature*, Pangu-Weather is the world's first AI model that delivers more accurate weather forecasts than traditional numerical prediction methods.

Huawei's foundational software, including openEuler and GaussDB, has also seen broad application in multiple industries.

These are all the result of innovation between Huawei, different industries, and the academic community.

Platform capabilities for thriving ecosystems

Trees need deep roots to grow a dense canopy of leaves. Likewise, our industry needs the active participation of many partners and developers in order to thrive.

At Huawei, ecosystem development is a key long-term strategy. We advocate for open collaboration and helping others succeed. With this approach, we focus on developing core ICT technologies, as well as building up platform capabilities for complex hardware and sophisticated software, which we then open up to our partners to promote shared success.

We have fostered a robust device ecosystem based on HarmonyOS and Kirin, a general computing ecosystem based on openEuler and Kunpeng, an AI computing ecosystem based on CANN and Ascend, and a multiplatform developer ecosystem with Huawei Cloud as a unified portal.

To date, HarmonyOS has been deployed on more than 800 million devices, and more than 6,300 partners have joined our computing ecosystems. Among these, the Ascend-based AI computing ecosystem has grown particularly fast. We look forward to joining forces with other industry players to drive large-scale adoption of these technologies, optimize them, and move the industry forward.

As for the developer ecosystem, we have attracted more than 9.5 million developers to HarmonyOS, Kunpeng, Ascend, and Huawei Cloud. We provide a rich array of development tools on Huawei Cloud, making it easier for application, operating system, and database developers to do what they do best. The end goal is to stimulate innovation across the entire ecosystem.

Succeeding through quality and achieving quality growth

These days, digital technology is tightly integrated with every aspect of industry – and every aspect of our lives. In effect, ICT infrastructure has become the very backbone of an intelligent world, so ensuring quality is more important than ever. At Huawei, quality isn't just about meeting customer needs. It's our responsibility. We remain committed to succeeding through quality, and are working hard to make quality one of our core competitive strengths.

Building a robust quality management system requires concerted effort across the entire value chain. Huawei has built up decades of experience and capabilities managing quality in the ICT sector, and we are working to extend this experience to new domains like digital power and intelligent automotive solutions. We also hope to share these capabilities with our suppliers, channel partners, and ecosystem partners up and down the value chain. Together, we can promote quality growth across the industry.

Promoting digital inclusion and creating social value

Huawei's vision and mission is to bring digital to every person, home and organization for a fully connected, intelligent world. We want to help more people reap the benefits of digital technology.

Back in 2019, we launched our TECH4ALL digital inclusion program, which focuses on four domains: education, environment, health, and development.

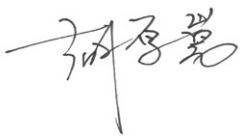
In education, working together with a wide range of customers, partners, and NGOs, we use innovative digital technology to make quality education more accessible and equitable. To date, we have launched digital skills training programs in 630 schools around the world, providing learning opportunities for more than 400,000 people.

In addition, we continue to implement Huawei ICT Academy programs and hold Huawei ICT Competitions around the world to provide young people with digital training and the opportunity to connect. To date, these programs have benefited more than 1.1 million students from over 100 countries and regions.

When it comes to the environment, we're using digital technology to promote nature conservation efforts in 53 of the world's protected areas, covering endangered species like Hainan gibbons and jaguars, as well as ecosystems like tropical rainforests and estuaries.

Through these programs and more, we're taking concrete action to make the world a better, more sustainable, and more inclusive place for all.

A new journey awaits us in 2024. We will create greater value for our customers and society by driving open innovation, building thriving ecosystems, and succeeding through quality. Here I'd like to thank those who have joined us – and will join us – along the way. Together, let's make something extraordinary. Let's build a fully connected, intelligent world.



Hu Houkun
Rotating Chairman

Business Highlights in 2023

In 2023, our ICT infrastructure business remained solid, and our consumer business met expectations. Both our cloud computing and digital power businesses grew steadily, and our intelligent automotive solution business began large-scale delivery.

Driving Ubiquitous Connectivity

- We worked with carriers and partners around the world to continue securing 5G's business success. By the end of 2023, the number of 5G users across the globe had exceeded 1.5 billion, and 5G networks built by Huawei had continued to deliver leading experiences. Innovative applications, such as naked-eye 3D, New Calling, and cloud phones, have comprehensively upgraded personal service experiences. And 5G has enabled the large-scale digitalization of industries, with more than 50,000 5G applications being put into use in many different industries. In addition, Huawei actively worked with other industry players to drive the development of 5.5G, and partnered with leading carriers around the world to promote the technological verification and commercial deployment of 5.5G and accelerate rollout.
- We helped our carrier, government, and enterprise customers build ubiquitous optical networks and intelligent IP networks as well as 10 gigabit smart homes, High-Quality 10 Gbps CloudCampus, Super-Connectivity 400GE CloudFabric, and Converged IP Transport Network. This infrastructure will create a solid foundation for the digital transformation and intelligent upgrade of all industries.
- We deepened cooperation with international organizations to provide connectivity to remote areas and continuously increase the access of remote communities to digital technology.

Enabling Pervasive Intelligence

- Digital, intelligent, and low-carbon transformations are continuing to gain traction. Therefore, Huawei unveiled its All Intelligence strategy this year in order to support a vast range of AI models and applications for all industries and accelerate their intelligent transformation. The Kunpeng and Ascend ecosystems continued to grow steadily, attracting more than 5.7 million developers and 6,300 partners, and more than 17,400 solutions have been certified. Huawei also released a reference architecture that will drive industrial intelligent transformation, as well as a number of related solutions and a white paper titled *Accelerating Intelligent Transformation*, which offer practical advice and references that help industries make the most of intelligence.
- We released Pangu Models 3.0 to dive deep into industries and develop tailored models and capability sets for a wide range of industries, including finance, government services, manufacturing, mining, meteorology, railways, automobiles, and healthcare. These models combine industry know-how with foundation model capabilities, reshaping industries and boosting productivity and efficiency.
- In the intelligent automotive solution domain, we worked with more than 300 partners to build an intelligent industry ecosystem. Together, we have created experience benchmarks for intelligent driving, intelligent cockpits, and intelligent vehicle control and contributed to industry standards and key technologies, jointly expanding the market and accelerating the intelligent transformation of the automotive industry.

Delivering a Personalized Experience

- In the consumer business, we have continued to innovate by focusing on consumers, creating an inspired AI experience across all scenarios and building a high-end brand that has a human touch and is liked and trusted by consumers. We have also worked with our partners to build a prosperous HarmonyOS ecosystem and achieve business success.
- We launched smartphones like the HUAWEI Mate 60 Series and unveiled a new ultra-high-end brand ULTIMATE DESIGN, all winning high acclaim from consumers. By the end of 2023, Huawei had shipped a grand total of over 100 million tablets and over 150 million wearables around the world, and served more than 450 million users in the fitness and health domain. Under the Huawei Zhixuan model, we worked with partners around the Harmony Intelligent Mobility Alliance (HIMA) to launch products that deliver ever-improving experiences.
- We officially launched HarmonyOS 4 in 2023, and by the end of the year HarmonyOS had been deployed on more than 800 million devices.

Building a Digital Platform

- As industries rush to embrace digital and intelligent transformation, Huawei Cloud continued to implement its Everything as a Service strategy, helping customers unleash the power of digital faster. By the end of 2023, Huawei Cloud was providing customers from more than 170 countries and regions with stable, reliable, secure, trustworthy, and sustainable cloud services.
- Huawei Cloud also actively innovated and launched the Ascend AI cloud service as well as the GaussDB distributed database, more than 20 software development tools, and products like the CraftArts hardware development pipeline, to help industries go digital and intelligent faster.
- Huawei Cloud envisions an ecosystem that is Of All, By All, and For All. We aggregate applications for numerous industries and empower developers and partners around the world. By the end of 2023, over six million developers and 40,000 partners were working with Huawei Cloud to jointly build a thriving ecosystem for innovation on the cloud.

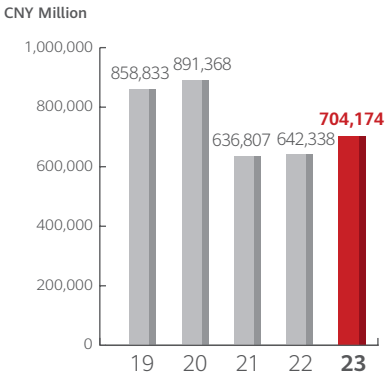
Five-Year Financial Highlights

	2023		2022	2021	2020	2019
	(USD Million)	(CNY Million)	(CNY Million)			
Revenue	**99,448**	**704,174**	642,338	636,807	891,368	858,833
Operating profit	**14,744**	**104,401**	42,216	121,412	72,501	77,835
Operating margin	**14.8%**	**14.8%**	6.6%	19.1%	8.1%	9.1%
Net profit	**12,280**	**86,950**	35,562	113,718	64,649	62,656
Cash flow from operating activities	**9,859**	**69,807**	17,797	59,670	35,218	91,384
Cash and short-term investments	**67,128**	**475,317**	373,452	416,334	357,366	371,040
Working capital	**59,550**	**421,662**	344,938	376,923	299,062	257,638
Total assets	**178,454**	**1,263,597**	1,063,804	982,971	876,854	858,661
Total borrowings	**43,556**	**308,414**	197,144	175,100	141,811	112,162
Equity	**71,682**	**507,568**	437,076	414,652	330,408	295,537
Liability ratio	**59.8%**	**59.8%**	58.9%	57.8%	62.3%	65.6%

Note: The financial information is in accordance with IFRS Accounting Standards, and converted into United States dollars ("USD") using the closing rate at the end of 2023 of USD1.00 = CNY7.0808.

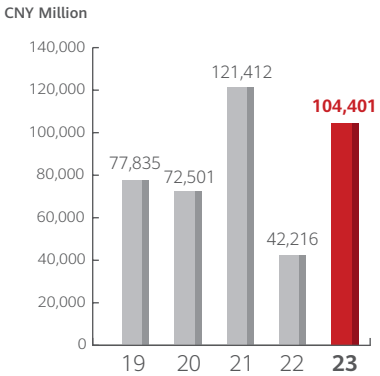
Revenue

CAGR: (5)%



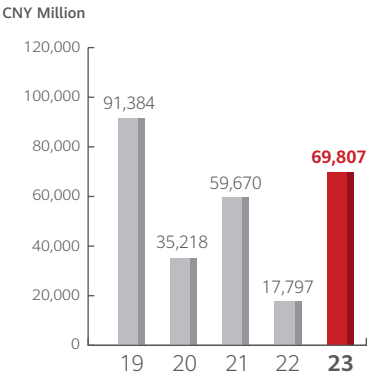
Operating profit

CAGR: 8%



Cash flow from operating activities

CAGR: (7)%



Message from the Chairman

Pressing ahead to achieve our business development goals

In 2023, all hands were on deck to achieve our business development goals, and our performance was in line with forecast. I'd like to thank our customers, partners, and friends from all over the world for their ongoing trust and support.

Over the past year, we invested more in technological innovation and continued to deliver high-quality products and services. We also buckled down to enhance our overall competitiveness. Our ICT infrastructure business remained solid, and our consumer business met expectations. Both our cloud computing and digital power businesses grew steadily, and our intelligent automotive solution business began large-scale delivery. All the while, we have worked hard to drive digital inclusion and promote green and sustainable development.

In 2024, we will continue to forge ahead, united as one, investing strategically and strengthening the capabilities we need to ensure sustainable survival and hone our overall competitiveness. We will focus on creating greater value for our customers, partners, and society as we work to achieve steady, long-term growth.

Promoting sustainable development through digital inclusion

Everyone should have access to stable connectivity. We believe that connectivity is not just a basic right for every person, but also a cornerstone of the digital economy.

For decades, Huawei has been committed to pushing the boundaries of ICT and promoting its global adoption. We have actively promoted the deployment of digital infrastructure and interconnectivity to

bring more people into the digital fold. And now, we are extending these efforts by innovating in both connectivity and computing to provide our global customers with leading ICT solutions.

Huawei is also an active member of the International Telecommunication Union's Partner2Connect Digital Coalition. After joining the coalition, as of 2023 our ICT solutions have brought connectivity to 90 million people in remote regions in nearly 80 countries around the world.

When Türkiye was struck by a catastrophic earthquake, we worked side-by-side with our carrier customers to rebuild over 1,900 sites within 72 hours. Together, we got the damaged networks back online so that people in affected areas could access critical network services.

In Pakistan, we worked together with international organizations and local governments to connect remote communities, giving residents access to telemedicine services through broadband networks and bringing online education to students through a smart classroom platform.

In China, when Jishishan County in Gansu Province was rocked by a massive earthquake, we immediately set out to affected areas in both Gansu and Qinghai. Alongside our carrier customers, we quickly restored communications at more than 100 key sites in Gansu, and recovered all disrupted services in Qinghai Province within 16 hours, helping people re-connect with their loved ones.

In addition to connectivity, we are working to drive broader digital inclusion through our TECH4ALL program. This program has brought about long-term positive change to remote areas and a wide range of environmental protection efforts. As of the end of 2023, our TECH4ALL education programs have benefited 630 schools and more than 400,000 people.

In 53 of the world's protected areas, we are also using digital technology to increase biodiversity, enhance natural resource sustainability, and improve natural resource utilization.

Enabling digital industries for an intelligent world

Digital, intelligent, and low-carbon transformation is picking up speed around the world. Breakthroughs in AI technology and applications are enabling industries to go intelligent faster. Mobile networks are evolving towards 5G and 5.5G. Smart device ecosystems for all scenarios are converging faster than ever, the automotive industry is well on the way to going intelligent, and the transition to clean energy is gaining traction. As the intelligent world takes shape, ICT will be further integrated into all industries, and computing will become a fundamental driver of productivity, helping the digital economy take flight.

Huawei will delve deeper into industry digitalization, accelerate the construction of computing infrastructure, and promote digital and intelligent transformation in all industries. Together with our global customers and partners, we want to build a leading computing backbone that will power the intelligent world.

Powering green and low-carbon development with digital technology

Green and low-carbon development has become an important part of socioeconomic transformation on a global scale. At Huawei, we believe that digital technology is an effective tool to fight climate change, protect the environment, and enable green development. Digitalization and decarbonization can work hand-in-hand, propelling and reinforcing each other to help build a greener world.

In Saudi Arabia, for example, our latest energy-saving technologies were used to build nearly 100 wireless sites in the NEOM project. Furthermore, our cooperation with Zain KSA has helped cut their wireless network energy consumption by nearly 28%.

In China, we also launched our green Wi-Fi solution for smart campuses, which uses innovative algorithms to cut the average annual power consumption of campus Wi-Fi networks by about 20%.

Renewable energy will be crucial for green and sustainable development. At Huawei, we continue to increase the use of renewable energy in our own operations. Our digital power business is also working to drive the transition to renewable energy in all industries by focusing on areas like clean power generation, mobility electrification, and green ICT power infrastructure. By the end of 2023, our digital power solutions have helped customers generate 997.9 billion kWh of green power and save 46.1 billion kWh of electricity. These efforts resulted in a reduction of 495 million tons in CO_2 emissions.

Green and low-carbon solutions are providing new momentum for sustainable development. Industries are also embarking on a new journey that combines digital, intelligent, and green transformation. This will stimulate innovation and encourage efforts to build next-generation digital and energy infrastructure that supports green and low-carbon development.

Growing together with partners through open innovation

Huawei delves deep into research and innovation, and we take an open approach to both as we work with our partners worldwide to probe the frontiers of science and technology.

As part of our broader collaboration efforts, we closely engage with academic associations around the world to explore the challenges that industries face. We have also released more than 70 new research topics through academic platforms in an effort to drive advancements in computer science and AI.

In 2023, Huawei and its partners held multiple competitions and training activities, including ICPC Training Camps, the ICPC Challenge Championship, and various bootcamps. Through these programs, we shared our industry know-how with academia and learned from their expertise. Together, we are invigorating academic pursuits and encouraging students and researchers to unleash their full potential.

We are also working with global partners and developers to improve the device ecosystem based on HarmonyOS and Kirin, the general computing ecosystem based on openEuler and Kunpeng, as well as the AI computing ecosystem based on CANN and Ascend. Together, we are working to stimulate innovation across ecosystems and achieve shared success.

By the end of 2023, HarmonyOS was deployed on more than 800 million devices, and the HarmonyOS ecosystem attracted more than 2.2 million developers.

The Kunpeng ecosystem has also been developing steadily. To date, we have worked with more than 4,700 partners to launch over 14,500 industry-specific solutions.

In computing, we have joined forces with industry partners to drive the development of the openEuler operating system, the openGauss database, and the MindSpore AI framework. We have also further enhanced all-scenario collaboration for openEuler, and by the end of 2023, over 50% of the industry's

major foundation models were natively trained on MindSpore. The MindSpore open source community now serves more than 5,500 enterprises.

For Ascend, we continue to build leading AI training clusters and a complete series of inference products. We further opened up the heterogeneous compute architecture – CANN 7.0. And by the end of 2023, more than 1,600 independent software vendors (ISVs) have used Ascend to launch over 2,900 industry-specific AI solutions.

On the operations side, Huawei is committed to globalized operations and diversifying our supply chains to ensure long-term, continuous, and stable supply, and to lay the foundations for more sustainable development. We have established long-term partnerships with over 10,000 suppliers and partners around the world. Through open collaboration, we strive to overcome all manner of difficulties and challenges over the course of development. We are confident that our work with partners will drive shared growth and benefits, and help forge a secure, reliable, competitive, and healthy value chain. Ultimately, this will allow us to provide higher-quality products and services for customers around the world.

Enhancing corporate governance and ensuring operational compliance to better serve our customers

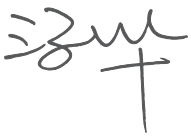
A robust corporate governance system is the cornerstone of sustainable development. In 2023, we continued to build up and optimize our corporate governance system. Last year, our Representatives' Commission held one meeting where a new Board of Directors was elected, resulting in a new set of regular and alternate directors.

In 2023, our Board of Directors held 12 meetings where they reviewed and approved matters such as the company's medium-to-long-term strategic plan, as well as the company's annual business plan, audit report, profit distribution, and capital increases.

At Huawei, we believe that legal compliance is a bulwark against the uncertainties of international politics. We are committed to conducting business with integrity, adhering to business ethics, and observing all applicable laws and regulations in the countries and regions where we operate. This is a core guiding principle upheld by our management team. For years, we have worked hard to build a compliance management system that aligns with industry best practices and embeds compliance management into our business activities and processes. These efforts continue to this day. We work hard to create a culture of integrity, and require all employees to comply with our *Business Conduct Guidelines* (BCGs).

We continue to communicate openly and embrace transparency so that our customers, partners, and the rest of the world can see what we truly stand for. We welcome stakeholders – including governments, the media, researchers, and experts – to visit our company to strengthen mutual understanding and trust.

No matter what changes come our way, we will stay committed to openness, collaboration, and innovation. We will continue to press ahead against all manner of difficulties and stay true to our vision and mission – to bring digital to every person, home and organization for a fully connected, intelligent world.



Liang Hua
Chairman of the Board

Industry Trends

The Age of Intelligence Is Coming – and Fast

The world is full of uncertainty these days. Economic instability, geopolitical risks, climate change, and all manner of challenges have left us in a state of global flux. Against this backdrop, however, there is one thing we can be certain about: Major trends like digitalization, intelligence, and decarbonation are taking hold – and gaining momentum all around us.

This momentum was especially clear throughout 2023 as the world made incredible progress towards a new age of intelligence. We now find ourselves in the midst of a new industrial revolution where AI is penetrating the fabric of all sectors at an incredible rate, taking productivity and creativity to new heights.

Renowned futurist Kevin Kelly has characterized AI as a type of artificial power, one that can eventually be tapped – as easily as electricity – to cognify everything around us. In the next 100 years, he said in a 2023 interview, artificial intelligence will exceed anything that other artificial powers can accomplish.

AI will fuel the convergence of the digital and physical worlds, redefining everything and changing how we live and work, both as individuals and as industries. It will bring unprecedented challenges and opportunities.

To bring the full value of intelligence to industries, we need to make all things connectable, all applications modellable, and all decisions computable.

- All things connectable: Not just physical objects, but also logical and virtual objects, including both digital equipment as well as traditional terminals and devices. With everything connected, *data* can be passed up and *intent* can be passed down.
- All applications modellable: Broad adoption of AI foundation models will bring the benefits of smart applications to people, homes, and organizations more rapidly than ever.
- All decisions computable: An accessible, ubiquitous supply of computing power will make intelligence more readily available wherever it's needed and help unleash the full potential of data.

AI is giving rise to a staggering array of innovative applications. It's also stimulating across-the-board changes to devices, networks, computing, and cloud, taking us one step closer to a truly momentous intelligent world.

Digital Infrastructure and Smart Devices Will Evolve Rapidly

Connectivity: Full speed ahead with 5.5G

The focus of network build-out has shifted from straightforward connectivity to center around experience itself. In the age of intelligence, 5.5G networks – the next evolution of 5G – will take it one step further: They will be productivity-centric, helping all industries vastly enhance their ability to create. 5.5G will deliver universal 10 Gbit/s access for digital services, elastic ultra-broadband transport, and massive computing power from hyper-converged data centers. It will be the cornerstone of new digital infrastructure and drive the digital economy forward. But evolving to these productivity-centric networks will require effort in several areas:

- Ubiquitous 10 Gbit/s ultrabroadband access: This upgrade will provide universal 10 Gbit/s broadband access to mobile users everywhere they go, and bring ultrafast connectivity to every nook and cranny of homes around the world. Enterprises will also benefit from an enhanced 10 Gbit/s experience

on their campus networks, as well as 10 Gbit/s elastic private line services with higher throughput for growing computing needs. Universal high-speed connectivity will be vital to accelerate the adoption of digital services across all sectors of society.

- 400G converged transport networks: Upgrading converged transport networks to 400G will increase transport power and, with end-to-end optical cross-connect (OXC), will guarantee experience for latency-sensitive services across different latency circles (e.g., 1 ms for access networks, 5 ms for city networks, and 20 ms for nationwide networks).

- Advanced hyper-converged architecture for data center networks: Based on this architecture, 800GE interconnection will help fully unlock the potential of general computing, AI computing, high-performance computing, and storage. Congestion notification algorithms will ensure zero packet loss, and network-scale load balancing algorithms will help increase the training efficiency of AI cluster networks by 20%.

- Telecom foundation models: AI models specifically designed for telecom networks will enable carriers to evolve towards L4 autonomous driving networks (ADNs) that are more autonomous, digitalized, and intelligent than ever, allowing network management engineers to double their efficiency.

Computing infrastructure: Making computing power and intelligence available wherever it's needed

Breakthroughs in AI technology and applications are driving industrial transformation at a rate and scale never seen before. In particular, foundation models have brought artificial intelligence to an inflection point, where AI is going beyond perception and analysis to generate new content entirely; where multi-modal models are taking precedence over single-modal models; and where special-purpose AI is giving way to more general-purpose application. AI applications themselves have gone beyond consumer domains to support core industrial scenarios. Over the next two years, AI applications will create even greater value in more than 50% of core industrial scenarios. To help industries maximize the value of AI, we need to adapt computing infrastructure in two major ways:

- Adopting new computing architectures that cater to diverse computing needs: Demand for heterogenous computing capabilities is changing the way data centers are designed, and demand for AI computing is growing exponentially fast. We estimate that, between 2020 and 2030, global demand for general computing power will increase tenfold to reach 3.3 ZFLOPS, while demand for AI computing power will grow by a factor of 500 to hit 105 ZFLOPS. The world will generate roughly 1 yottabyte of data annually, a 23-fold increase over 2020. To address these diverse needs for massive computing power, we need to replace CPU-centric computing architecture with peer-to-peer architecture – structures that help us overcome limitations in conventional architectures, boosting both computing bandwidth and performance while reducing latency.

- Breaking through bottlenecks in large-scale computing: Computing power is crucial for AI innovation. The amount of computing power available determines the speed of AI iteration and innovation, and massive amounts are needed to train foundation models. Through systematic design, we can evolve data centers into de facto AI supercomputers that tightly integrate computing, storage, networking, and power supply. Data centers like this can deliver incredible amounts of computing power with greater availability, better energy efficiency, and a more stable environment for long-term model training. This will lay the groundwork for developing a wide range of AI models and applications.

Cloud: Providing Everything as a Service to accelerate industrial intelligence

All industries are actively embracing AI, infusing their know-how and ingenuity into foundation models that help them tackle complex issues, including those in research, production, supply, sales, and service. New innovations in AI and foundation models are emerging every day, and as AI theory gains more practical application, developments in this sector will turbocharge the intelligent transformation of industries.

But to speed up the transformation process, there are a number of technical gaps that industries need to overcome. On the cloud front, AI is reshaping the technical stack, redefining the cloud's unique strengths, and transforming cloud infrastructure – as well as the applications running on it. To keep up with these trends, cloud service providers (CSPs) need to revamp their architecture, their computing and storage systems, the relationship between data and AI, app development, and their overall security posture.

- Architecture: CSPs will need to move from CPU-centric client-server architecture towards peer-to-peer architecture that can keep up with more diverse computing needs.
- Computing and storage systems: CSPs will need to shift from general computing to high-performance AI computing, and upgrade from data lake storage to AI-native intelligent storage.
- Data and AI: CSPs will need to move towards "Data for AI" and "AI for Data" approaches, where data and AI work more seamlessly together to create greater value.
- App development: CSPs will need to transition from full-code development to low-code or zero-code development, and further towards AI-assisted or even autonomous development.
- Security posture: CSPs will need to go beyond traditional network and information security and focus on building zero-trust systems. Embracing zero-trust will help them better align with ever-growing customer requirements for cyber security and privacy protection, and contribute to trustworthy cloud services.

Accelerating intelligent transformation will also require an entirely new tech ecosystem. Innovating around industry needs raises the bar for the quality and efficiency of R&D tools. Developers will need cloud-native core software and development toolchains (e.g., software code repositories, hardware development pipelines, and software development pipelines). Building these tools will take more in-depth collaboration across the entire value chain, including industry, academia, researchers, and users alike. Collaboration is the driving force behind a truly robust tech ecosystem.

Smart devices: Providing an intelligent experience across all consumer scenarios

As more and more consumer devices make use of AI, we will see greater convergence in multiple fields: chip architectures, operating systems, and device ecosystems across different scenarios. Formerly disparate ecosystems will begin to converge at a growing rate, such as mobile device ecosystems, office device ecosystems, and IoT device ecosystems. This trend promises huge benefits: Users will receive a smarter, more intuitive experience across all scenarios – one characterized by a larger variety of services, greater convenience, and better security. At the same time, developers will see a boost in their productivity and returns.

With AI, smartphones, personal computers, and tablets will provide a far superior experience, even for basic functions like taking photos, processing images, communications, entertainment, and productivity. On-device AI assistants will be better able to understand user intent and provide people with exactly what they need. Users will be able to accomplish what they want faster and let their creativity run wild.

New ways of human-computer interaction (e.g., spatial computing, gesture tracking, and eye tracking) and new form factors (e.g., foldable phones, augmented reality and virtual reality devices, robots, and intelligent cockpits) will keep emerging in greater numbers.

And with greater convergence across different scenarios (like fitness, office, travel, and home), users will have access to an intuitive, consistent, and intelligent experience across devices that work seamlessly together with AI-native technology. Greater convergence will also allow for better personal data management and a smarter experience across the board.

Intelligent vehicles: Bringing ICT technology on board to redefine the mobility experience

Electrification, intelligence, and connectivity are megatrends in the automotive industry. In 2023, global production and sales of new-energy vehicles reached record highs, and China's automotive market in particular performed remarkably well. Now with electrification well underway, carmakers are shifting gears towards intelligence.

We will see a dramatic upgrade in mobility experience as vehicles integrate new ICT technologies. These include radar, new electrical/electronic architectures, autonomous driving platforms with massive computing power, intelligent cockpits for more intuitive interaction with on-board systems, and intelligent communications modules. Equipped with these technologies, intelligent electric vehicles will deliver safer and more comfortable mobility – and a more personalized experience along the way.

Intelligent driving will continue to gain traction. According to a recent report on consumer preference, intelligent vehicle controls, intelligent driving, and intelligent cockpits have become more important factors in purchase decisions. This is especially true of functionality like mapless navigation, which enables intelligent vehicles to effectively navigate in all types of unknown environments, whether it be highways, ring roads, or even urban streets. At the same time, the intelligent cockpit sector will continue to grow and expand to cover a wider range of mobility scenarios, including various types of vehicles, high-speed trains, and ships. Going intelligent is an unstoppable trend in the mobility industry.

Digital power: Building three new types of energy infrastructure to power the intelligent world

The UAE Consensus was signed in 2023, representing another significant global push for decarbonation. The transition to clean energy is picking up speed worldwide. For solar energy, advancements in photovoltaics and energy storage technology are driving down both the levelized cost of storage (LCOS) and the levelized cost of energy (LCOE). New energy sources, solar and wind power in particular, will take center stage – a trend that will bring huge changes to conventional electric power systems based on fossil fuels. As digital and AI technologies continue their rapid advance, digital will further weave its way into the energy domain, supporting three new types of energy infrastructure that will power the intelligent world.

- New energy infrastructure for power systems: Grid forming technology will play a central role in these systems, fueling the adoption of new energy and shifting their role from secondary sources to primary sources.
- New energy infrastructure for electric vehicles (EVs): Electric vehicles and charging piles are essential components of new power systems, so coordinated development of EVs, charging piles, and charging networks will be vital moving forward. Electricity will play a dominant role in the energy sector, with its share in final energy consumption rising sharply.
- New energy infrastructure for the digital industry: New power supply systems, especially those for large low-carbon data centers, will use green energy to provide more eco-friendly computing power for digital and intelligent transformation.

New power systems will increasingly depend on renewables, power electronics equipment, and high-density energy storage systems with large capacity. This means the end-to-end quality and safety of these power systems will be more important than ever. The three new types of energy infrastructure outlined above will operate with enhanced quality, safety, and reliability to power the intelligent world.

Exploring Nonstop for a Fully Connected, Intelligent World

Building an intelligent world will take concerted effort from a wide range of stellar players.

Over the past 30 years, from the information age to the digital age, Huawei has never stopped imagining what the future might hold. More importantly, we've never stopped working to make that future happen. Back in 2003, we introduced our All IP Strategy to boost connectivity. In 2013, we announced the All Cloud Strategy to expedite digitalization. In 2023, we took yet another huge step forward, unveiling our All Intelligence Strategy in a bid to accelerate intelligence.

Moving forward, we will support a vast range of AI models and applications across industries by driving AI innovation across all aspects of our organization, from theory, architecture, and engineering to our products, portfolios, and business models.

On a river with a hundred ships, those who paddle the hardest will take the lead. So let's take the same ship. Amidst the rising tides of intelligence, if we work together and keep exploring, we can chart a solid course towards a fully connected, intelligent world.

Management Discussion and Analysis

Our Vision, Mission, and Strategy

Huawei's mission is to bring digital to every person, home and organization for a fully connected, intelligent world. To this end, we will:

- Drive ubiquitous connectivity and promote equal access to networks to lay the foundation for the intelligent world
- Provide diversified computing power to deliver ubiquitous cloud and intelligence
- Redefine user experience with AI, offering consumers a more personalized and intelligent experience across all scenarios, including home, travel, office, entertainment, and fitness & health
- Build powerful digital platforms to help all industries and organizations become more agile, efficient, and dynamic

Ubiquitous Connectivity

Every person has the right to be connected. Connectivity is the foundation for social progress and economic growth. Connections will soon become a natural and ubiquitous resource, provided by networks that proactively sense changes and user needs. These networks will offer intelligent, seamless, and secure connections to people and things whenever and wherever they want. With the advent of 5G, we begin a new chapter in this story.

Pervasive Intelligence

In the digital economy, computing power is a new driver of productivity. Data itself is a core asset, and cloud and AI are the new tools of productivity. Moving forward, AI computing will account for more than 80% of a computing center's capacity, providing the muscle for practical AI applications in all areas of life. To deliver ubiquitous cloud and intelligence, we will need to provide diversified computing power.

Personalized Experience

Using AI, cloud, and big data technologies, enterprises can better understand their customers' needs and innovate with greater agility to craft a more personalized experience. Coordination and collaboration across industries will drive innovation at scale. With the continuous evolution of smart devices, a seamless experience across all scenarios will become the foundation of an intelligent life.

Digital Platform

A new digital wave is sweeping the globe. Digital and AI technologies are helping all governments and enterprises become more agile, efficient, and dynamic. Open, secure, flexible, and easy-to-use digital platforms are facilitating innovation and transformation in all industries. They will be the bedrock and the fertile ground for our digital society to flourish.

Ubiquitous Connectivity

Connectivity has extended from people to things and from our homes to the factory floor. Now it's the foundation of everything in an increasingly intelligent world. Huawei is doing what it can to help our customers get ready for the future.

For mobile and home users, Huawei teams up with carriers to provide an ultra-broadband experience across all aspects of everyday life.

For governments and enterprises, Huawei works with our partners to enable digital and intelligent transformation in different industries. We provide intelligent connectivity solutions for different industrial scenarios, including ubiquitous ultra-broadband, deterministic experience, and hyper-automation, to support the diverse needs of all customers.

We are working to push connectivity to its limits with products and solutions like 5.5G, simplified green sites, fully-converged cloud-native core networks, best-in-class Wi-Fi 7, Super-Connectivity 400GE CloudFabric, optical cross-connect (OXC), fiber to the room (FTTR), and green data centers. We are also actively collaborating with the industry to define its next steps and drive the advancement of connectivity. To better meet connectivity requirements in industrial scenarios, we are using AI to enable hyper-automation of network O&M and developing new algorithms to pave the way for truly deterministic IP networks.

As green development becomes the clear path forward for all industries, the compounding forces of digitalization and decarbonization will drive us ever closer to a sustainable future. Huawei works closely with customers and partners on nonstop innovation for new digital and energy infrastructure. We aim to provide green ICT that will enable green development and bring greener connections to all parts of the world.

Pervasive Intelligence

Data has become a valuable raw material, and computing power has become the new driver of productivity. The amount of data we produce will explode as more and more of the devices around us become smart, and more industries will need massive, intelligent storage capabilities to handle these new resources. Abundant and affordable computing power will determine the future of the digital economy.

Through nonstop innovation in data storage, diversified computing, and cloud services, Huawei is helping industries go digital and intelligent by making pervasive intelligence possible. Together we will build a fully intelligent world.

In data storage, Huawei provides customers with products and solutions that span all domains and scenarios, in a bid to satisfy requirements for sufficient storage, free mobility, and the full utilization of mass data. Our goal is to build a high-performance, reliable, green, and secure data storage foundation for customers.

In computing, Huawei sticks to our strategy of "open hardware, open source software, partner enablement, and talent cultivation". We are developing the Kunpeng, Ascend, and openEuler ecosystems as part of our efforts to bring more diversified computing power to the whole world.

In cloud computing, Huawei Cloud is focusing on AI for Industries and AI for Science. We are diving deep into industrial scenarios and harnessing AI to help enterprises tackle their biggest challenges, thereby reshaping industries with AI.

Personalized Experience

The physical and digital worlds are converging, and the process is speeding up. Mass production is giving way to mass customization, leading to greater business innovation, closer collaboration across ecosystems, and a richer user experience.

Using new technologies like AI and cloud, enterprises can better understand their customers' needs and innovate with greater agility to craft a more personalized experience. Coordination and collaboration across industries will drive innovation at scale.

In our user-centric intelligent world, usage scenarios and experiences are evolving. The boundaries between products and services continue to break down, with many converging scenarios, including home, travel, office, and fitness & health. Soon all content and services will travel with users for a completely seamless, holistic experience. Smart collaboration between software and devices will give users an intelligent experience across all scenarios.

We will continue working closely with partners across our software, service, and hardware ecosystems to both integrate existing technology and drive innovation to better serve consumers. Our "1 + 8 + N" Seamless AI Life strategy is centered on smartphones and touches on five major scenarios: Smart Office, Fitness & Health, Smart Home, Easy Travel, and Entertainment. Through HarmonyOS, we empower our ecosystem partners to provide consumers with a superior, intelligent experience across all scenarios.

Digital Platform

Data volumes are growing exponentially as more and more industries embrace intelligence. Enterprises are applying digital and intelligence to a growing array of scenarios as cutting-edge technologies, innovative models, and intelligent algorithms continue to emerge. All of this is creating a multiplying effect of accelerated innovation.

From video data and industrial data to personal data and consumption data, all data is coming from more sources and in more forms and is becoming more fragmented. Powerful digital platforms are needed to integrate this data.

New technologies in connectivity, cloud, AI, computing, and industry applications are converging to support comprehensive intelligent connections between people, things, and information at multiple levels. These technologies will help industries expand their traditional boundaries, and enable enterprises to expedite intelligent upgrade. Enterprises will have to adapt their strategies, organization, processes, marketing, services, manufacturing, and R&D to cope with changes. To do so, enterprises need to synergize the cloud, networks, edge, and devices to build an open, powerful digital platform with multidimensional perception, all-domain collaboration, accurate judgment, and continuous evolution. With cloud as the foundation and AI at its core, this digital platform helps users accumulate industry know-how, rapidly innovate their core business processes, and quickly iterate to respond to changes in their business environments.

A digital platform is one of the core engines that drives success in digital and intelligent transformation. New information technologies can make organizations more efficient through intelligent management of their physical assets like buildings, factories, production lines, and utilities. At the same time, advanced digital technologies in connectivity, cloud, AI, and computing can change the way organizations operate and create new business models. This is the process of digital and intelligent transformation. An organization's IT systems and the corresponding operational methods combine to form a digital platform.

Together with its ecosystem partners, Huawei provides innovative technologies, products, and solutions that help its customers build open, secure, flexible, and easy-to-use digital platforms. With its digital platform, Huawei assists customers in crafting their own intelligent solutions, and enables industries to navigate digital transformation and intelligent upgrade. Huawei's digital platform is injecting new momentum into the digital economy.

2023 Business Review

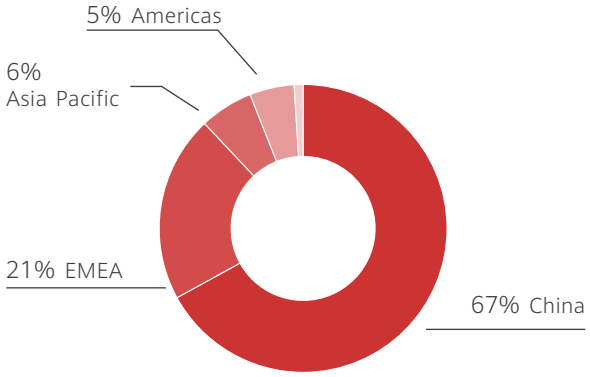
In 2023, Huawei maintained strategic focus and fully leveraged the collective strengths of our business portfolio, our ability to innovate, and our grasp on complex software and hardware platforms. This allowed us to keep providing our customers with high-quality products and services alongside our ecosystem partners. In 2023, Huawei's annual revenue was CNY704,174 million, an increase of 9.6% year-over-year. Our overall performance was in line with forecast.

By business segment

(CNY Million)	2023	2022	YoY
ICT Infrastructure	**361,997**	353,978	2.3%
Consumer	**251,496**	214,463	17.3%
Cloud Computing	**55,287**	45,342	21.9%
Digital Power	**52,607**	50,806	3.5%
Intelligent Automotive Solutions	**4,737**	2,077	128.1%
Other	**8,624**	3,978	116.8%
Elimination	**(30,574)**	(28,306)	8.0%
Total	**704,174**	642,338	9.6%

By region

(CNY Million)	2023	2022	YoY
China	**471,303**	403,999	16.7%
EMEA	**145,343**	149,206	(2.6)%
Asia Pacific	**41,041**	48,048	(14.6)%
Americas	**35,362**	31,898	10.9%
Other	**11,125**	9,187	21.1%
Total	**704,174**	642,338	9.6%



- In the Chinese market, industries were going digital, intelligent, and low-carbon at a faster rate. To adapt to this market trend, we improved our ability to integrate software, hardware, chips, edge, devices, and cloud, and fully leveraged our collective strengths in computing, storage, networks, digital power, devices, and intelligent automotive solutions. As a result, Huawei saw growth in all of its business domains in China. Our revenue from the Chinese market was CNY471,303 million in 2023.
- In Europe, the Middle East, and Africa (EMEA), ICT infrastructure such as 5G and optical networks was being constructed rapidly and industries sped up digital, intelligent, and low-carbon transformation. As a result, our cloud computing business grew rapidly, our ICT infrastructure business remained steady, and the performance of our digital power business was in line with forecast. In addition, our consumer business remained focused on building out the HMS ecosystem and developing converged products. Huawei's revenue from this region was CNY145,343 million in 2023.
- In the Asia-Pacific Region, industries stepped up their efforts in digital, intelligent, and low-carbon transformation. As a result, our digital power and cloud computing businesses continued to grow, our consumer business ramped up innovation and saw a rapidly growing ecosystem, and the performance of our ICT infrastructure business was in line with forecast. Huawei's revenue from this region was CNY41,041 million in 2023.
- In the Americas, customers increased investment and industries accelerated digital, intelligent, and low-carbon transformation. Our ICT infrastructure business grew steadily, our digital power and cloud computing businesses continued to grow, and our consumer business remained focused on developing converged products. In 2023, our revenue from this region was CNY35,362 million.

ICT Infrastructure Business

ICT is the core engine that drives the development of the digital and intelligent economy. It is a key technology that drives industry upgrade and high-quality development for enterprises. As digital, intelligent, and low-carbon transformations continue to gain traction, Huawei has focused its efforts in the ICT infrastructure business on information distribution, interaction, transmission, processing, and storage. This allows us to provide leading products and solutions for telecom carrier, government, and enterprise customers around the world and support the digital and intelligent transformation of numerous industries.

We provide high-quality services to the carrier, government, and enterprise markets and create new value for customers:

- Carrier market: We work to build ubiquitous connectivity and enable pervasive intelligence, in order to help our carrier customers achieve business success. Together, we are accelerating the commercial deployment of 5.5G, taking digital and intelligent transformation to the next level, and leading humanity to an intelligent world faster.
- Government and enterprise market: To facilitate digital and intelligent transformation, we have launched a collaborative, open, agile, and trustworthy reference architecture for intelligent transformation. We have become a reliable partner for intelligent transformation across industries by providing digital and intelligent products and solutions that enable industries to go intelligent faster.

We are continuing to invest in the ICT industry to lead industry development and technological innovation. In 2023, we worked with other industry players to drive connectivity to new heights. As part of this, we also explored the evolution to 5.5G and helped establish 10 gigabit showcase cities around the world. In addition, we have worked to nurture the Kunpeng and Ascend ecosystems in order to support a vast range of AI models and applications that will help all industries thrive.

We also provide ICT services and software to support the digital and intelligent transformation of our carrier, government, and enterprise customers in operations and maintenance (O&M). In the ICT services and software domain, we have called upon our more than 30 years of experience in ICT services to provide a broad portfolio of digital and intelligent ICT service and software solutions by focusing on the entire business process that covers everything from network planning and construction to O&M, optimization, operations, and training. We aim to facilitate the digital and intelligent transformation of carrier, government, and enterprise customers by building green, efficient, secure, and robust ICT infrastructure that provides the ultimate experience.

Carrier Market

In 2023, Huawei remained customer-centric and continued to innovate. We enabled carriers to maximize the value of networks and explore potential monetization channels. We worked alongside carriers to expand the boundaries of their business and achieve sustainable business growth, and helped carriers achieve a positive business loop with 5G and explore the opportunities of 5.5G.

Since 5G networks were put into commercial use five years ago, they have been deployed by more than 300 carriers in more than 100 countries. There are now more than 1.5 billion 5G users. It took nine years – almost twice as long – for 4G to get to that level.

In the tests conducted by global authoritative institutions in 2023, Huawei helped multiple carriers around the world rank first in mobile network experience. We helped carriers start 5.5G commercial verification and testing in multiple cities around the world, and worked with them to fully explore five connectivity businesses to connect people, homes, things, vehicles, and industries. In 10 gigabit smart home scenarios, we helped carriers accelerate the upgrade to the 10 gigabit experience and explore new business opportunities.

Huawei helps carriers upgrade and build their network infrastructure and software systems into intelligent ones that have the capacity to evolve and support robust networks, converged cloud, and intelligence. Huawei Cloud works with carriers on cloud transformation and helps carriers seize new business opportunities that arise from intelligent upgrade through a variety of industry APIs and B2B practices.

2024 will mark the first year of 5.5G commercial use. Huawei will work with carriers to actively explore the evolution to 5.5G, build efficient, coordinated, green, stable, and intelligent networks which feature ubiquitous 10 gigabit access and offer a premium experience. This type of collaboration will take digital and intelligent transformation to a new level and propel us towards an intelligent world.

Driving Ubiquitous Connectivity to Help Customers Achieve Business Success

Huawei continues to innovate our products and solutions. We have worked with carriers and industry partners to explore service applications and verify key technologies, help carriers achieve business success with 5G, and unlock new applications and opportunities in 5.5G.

Jointly Creating New Value with 5G and Fueling New Business Growth

In 2023, Huawei actively helped carriers accelerate 5G monetization, including traditional traffic monetization and monetization through differentiated experiences and converged new services, and this helped to further unleash 5G potential and facilitate ongoing 5G business success.

- **In terms of traffic monetization,** by the end of 2023, many global carriers served by Huawei had invested in 5G construction and user base expansion. In China, the proportion of 5G package subscribers exceeded 70%, and this fueled the development of the digital economy. In markets outside China, Huawei helped carriers deploy 5G fixed wireless access (FWA) services that provided 100 Mbit/s wireless home broadband access to millions of households. These 5G FWA services significantly increased carriers' overall revenue growth.

- **In terms of experience monetization,** Huawei worked with carriers to shift towards 5G experience operations based on network capabilities such as rates, uplink, and latency. 5G experience operations have become a key driver of new growth. Deterministic rates have become a new paradigm for rate monetization. In markets outside China, FWA offerings have shifted from rate-based packages to experience-guaranteed packages, and this has increased the average revenue per user (ARPU) by about 25%. In China, carriers were some of the first to launch 5G livestreaming packages, which provided ultra-high uplink rates and VVIP services and increased the ARPU by more than 70%. Carriers also launched 5G packages with faster network access for gamers and financial investors to deliver a differentiated user experience and further increase ARPU. In markets outside China, carriers released 5G hotspot acceleration packages which supported on-demand and time-based subscriptions and these packages increased the ARPU by about 23%.

- **In terms of monetization through new services,** Huawei recognizes the fact that the applications of new technologies such as 5G, cloud, and AI are converging quickly, and that this is leading to a wide variety of new services and bringing new value to the industry in the following two domains:

  - **In individual-facing domains,** Huawei has actively supported carriers in developing converged applications such as cloud phones, New Calling, and naked-eye 3D. Chinese carriers have attracted a large number of new subscribers to the cloud phone service. Through cloud phones, individual users can access computing power. Cloud phones have become the portal to hallmark 5G applications. The first carrier to launch New Calling with visualized voice calling services has attracted many new customers. The average minutes of use (MOU) per customer increased by about 21% and the video call penetration rate increased by about 24%.

  - **In industry-facing domains,** Huawei has worked alongside carriers to facilitate large-scale industry digitalization through 5G. 5G has been applied at scale in industries such as oil and gas, mining, ports, manufacturing, and healthcare. In China, more than 1,000 fully connected 5G factories have been built. In markets outside China, 5G has enabled remote assistance through augmented reality (AR) for offshore oil and gas platforms, and this has significantly improved these platforms' operating efficiency.

Building 5G Networks to Deliver Exceptional Experience and Facilitate Ongoing Business Success

Huawei continues to innovate to help carriers build 5G networks that are highly coordinated, green, stable, intelligent, and capable of delivering exceptional user experiences. We also facilitate evolution to 5.5G by helping carriers build networks that deliver a 10 gigabit experience. These networks offer ten times

stronger capabilities and create a new space with hundreds of billions of connections.

- **Huawei helped carriers provide exceptional user experiences and meet differentiated service requirements.** In markets outside China, the rapid increase of 5G users has brought higher requirements on consistent indoor and outdoor experiences. Huawei deployed large-capacity, wide-coverage MetaAAUs on a large scale to deliver an exceptional and ubiquitous experience. In China, Huawei provided a 5.5G solution to deliver new capabilities such as ultra-high-speed uplink and downlink, deterministic experiences, and all-scenario Internet of Things (IoT). These have opened up a new market where all things are connected and intelligent.

- **Huawei helped carriers greatly improve operational and energy efficiency and maximize spectrum utilization.** In markets outside China, Huawei helped carriers deploy the ultra-broadband, energy-efficient GigaGreen solution to deliver consistent, high-quality 5G experiences across urban and suburban areas. This solution increased the camping ratio of 5G users to 98% and drastically improved the uplink experience. Huawei's energy-efficient Eco antennas reduce the power consumption of each site, which leads to a lower operating expenditure (OPEX) for carriers. As traditional frequency band resources become increasingly insufficient, it becomes more difficult to meet ultra-high-bandwidth backhaul requirements in the 5G era. Huawei's innovative microwave solution helped carriers implement long-distance, large-capacity backhaul, which greatly improved spectrum utilization and reduces energy consumption.

- **Huawei helped carriers relieve network congestion to accelerate growth in dataflow of usage (DOU) and ARPU.** In markets outside China, the number of users and the network traffic demand increased sharply, and most networks in urban areas became congested. Huawei's Massive multiple-input multiple-output (MIMO) solution with large capacity and multi-band integration increased the network capacity several-fold and shortened the return on investment (ROI) cycle for carriers. In densely populated areas, networks generally carry heavy loads and traffic demand is increasing rapidly. Huawei's innovative intermediate frequency (IF) solution helped carriers quickly upgrade their networks to almost double the capacity and reduce energy consumption by 27%. The solution also primed the carrier networks for 5G evolution.

- **Huawei helped carriers deploy 5G core networks with carrier-class stability and reliability.** In markets outside China, Huawei launched a six-dimensional high-stability core network model to solve the problem of frequent signaling storms on carriers' 5G networks. By detecting and eliminating potential risks in advance, this network model helped carriers build an AI-native, stable 5G core network.

  Huawei also worked with customers to innovate and leverage the intelligent network functions of 5G core networks. Together, we implemented differentiated experience assurance that can be evaluated in real time, optimized dynamically, and monetized to achieve business profitability, thereby enabling monetization across multiple dimensions such as network traffic, rates, and latency.

Leading the Way to Intelligent Connectivity with 5.5G and Jointly Exploring New Businesses

In 2023, Huawei worked with leading carriers around the world and industry partners to innovate and meet the requirements arising from new 5.5G applications and scenarios. Together, we promoted 5.5G technology verification and network deployment, and explored new business opportunities for 5.5G.

- **Individual- and home-facing applications:** Huawei has helped multiple carriers around the world verify 10 Gbit/s downlink and 1 Gbit/s uplink rates of 5.5G, to deliver exceptional experiences with FWA services. In October 2023, Huawei helped a carrier outside China launch the world's first 5.5G smart home service, featuring brand-new services such as naked-eye 3D, home care, and whole-house intelligence, which further unleashed the business potential of smart homes.

- **Industry-facing applications:** Huawei used 5.5G network technologies to support carriers in exploring and verifying digital and intelligent transformation in multiple sectors, such as manufacturing, mining, and transportation. In 2023, in the field of automobile manufacturing, Huawei worked with Chinese carriers to build flexible production lines based on 5.5G technologies, which reduced downtime in high-end core manufacturing processes and improved manufacturers' delivery capabilities. In the field of mining, Huawei helped a carrier build the world's first 5.5G smart mining

Huawei and a Chinese carrier were among the first to deploy a 5.5G 10 gigabit network and quickly incubate new businesses and ecosystems.

pilot network with an uplink rate of 1 Gbit/s. This network implemented panoramic visualization and remote control of fully mechanized underground core mining operations, thereby improving the safety of mining. In the field of transportation, Huawei worked with carriers to complete the verification of the low-latency 5.5G IoV solution on the wide area network (WAN). The solution is expected to be put into commercial use in 2024, and estimates suggest that it will reduce urban traffic congestion by about 20%.

Enabling 10 Gigabit Smart Homes to Help Carriers Achieve FBB Business Success

According to third-party statistics, by the end of 2023, there were more than 200 million gigabit broadband users, and more than 50 carriers had released 5-Gbit/s-or-higher packages. This was the perfect time to release 10 gigabit offerings. Drawing on our innovation capabilities in the optical broadband domain, Huawei helped carriers achieve fast coverage of 100 Mbit/s fiber to the home (FTTH), smooth upgrade to gigabit FTTH, and large-scale deployment of 10 gigabit smart homes, which led to business success in fixed broadband (FBB).

- **For 100 Mbit/s coverage,** Huawei used the central office (CO) + AirPON all-scenario solution to effectively reuse existing resources, implement fast network construction at low costs, reduce carbon emissions, and provide users with a high-quality network access experience. Currently, this solution has been deployed at scale in multiple countries and regions around the world.
- **For upgrades to gigabit,** Huawei provided the gigabit access solution to facilitate a smooth evolution to gigabit services. This solution has been used by many carriers around the world to improve user experiences and achieve stable ARPU growth.
- **For 10 gigabit smart homes,** Huawei leveraged the FTTR F30 solution's new capabilities such as whole-house coverage and beyond-gigabit to solve problems in indoor Wi-Fi coverage. In markets outside China, Huawei helped carriers explore opportunities to monetize new services, such as ultra-fast cloud-based network-attached storage (NAS) and gaming, as well as smart care. As a result, carriers were able to attract new users and increase the ARPU of home broadband services.

Building Converged Bearer Networks with the Best Experience to Facilitate 5G Business Success

New scenarios, such as 10 Gbit/s access and enterprises' digital and intelligent transformation, require bearer networks with higher bandwidth, lower latency, and higher reliability. Huawei helped carriers build congestion-free, low-latency, scalable, and highly reliable bearer networks. These networks facilitate the development of emerging services and help carriers achieve business success with 5G.

- **In the all-optical domain,** Huawei helped carriers build ubiquitous all-optical foundations with solutions such as optical cross-connect (OXC) and Alps-WDM. Globally, Huawei's Alps-WDM solution helped carriers increase deployment efficiency, lower overall costs, and streamline the O&M of

optical cables. In China, we have helped carriers build more than 60 all-optical cities, and these have consolidated the network foundation for developing the digital and intelligent economy.

- **In the data communication domain,** Huawei's NetEngine series routers, which feature large capacity, tight integration, ultra-high stability, and high energy efficiency, have been deployed by many carriers around the world to help them build converged bearer networks oriented to all services. In addition, carriers used the routers' new capabilities such as network slicing to ensure user experiences and improve user satisfaction. In addition, Huawei's Network Digital Map Solution enables multi-dimensional visualization, management, and optimization of networks, and this improves network O&M efficiency and accelerates network resource monetization.

- **In the IP+optical converged bearer domain,** to help carriers resolve cross-domain O&M difficulties, Huawei used the iMaster NCE-Super solution to implement end-to-end IP+optical orchestration and unified cross-domain management. This solution covers network planning, construction, maintenance, and optimization, and offers benefits such as visualized O&M, improved network orchestration efficiency, and significantly lower OPEX.

Inspiring New Growth with XtoB

In 2023, Huawei helped carriers around the world focus on sectors such as government services, education, healthcare, industrial, finance, and small- and medium-sized enterprises (SMEs). By taking differentiated measures such as enhancing connectivity, diving deep into campus scenarios, and developing cloud services, Huawei has helped address the challenges faced by numerous industries, including diverse scenarios, complex requirements, difficult maintenance, and multiple risks. Together, we helped enterprises make progress on their digital and intelligent transformation and achieve new business growth.

- **Enhancing connectivity – Maximizing network monetization through differentiated private line solutions:** Different enterprises have different requirements on private line services, such as reliability, latency, and service provisioning speed. In markets outside China, Huawei helped carriers deploy premium international private lines to connect multiple adjacent countries in the region, build international latency circles of 3, 6, and 9 ms, provision services about 50% faster, and enable the digital and intelligent transformation of large enterprises in the region. Huawei's innovative secure software-defined wide area network (SD-WAN) solution helped configure networks in minutes, made them capable of self-healing in seconds, and made them over 30% more secure.

- **Diving deep into campus scenarios – Opening up new campus spaces with scenario-based services:** Enterprises in the production and manufacturing sector have requirements for co-existing services such as keeping their core data within their campuses while using cloud-based office services. In China, Huawei helped carriers provide one-stop services including campus networking and edge IT, so that manufacturing enterprises could store their core design data assets securely on campus while enjoying remote offices on the cloud. The one-stop services improved productivity by more than 20% and reduced the TCO by about 50%. Campus scenarios such as education, healthcare, culture and tourism, and sports usually face challenges such as the coexistence of multiple networks and complex delivery. In markets outside China, Huawei worked with a carrier to provide a campus network solution that integrates 5G, Wi-Fi, optical fibers, and IoT technologies for stadiums. This solution improved the campus network delivery efficiency by more than 30% and more than tripled the carrier's revenue.

- **Developing cloud services – Providing one-stop value-added cloud services to improve service stickiness:** Based on the extensive enterprise broadband networks, carriers leveraged the strong capabilities of Huawei's localized service teams to provide scenario-based and standardized one-stop cloud network services for SMEs and the commercial market to solve problems such as numerous scenarios and difficult maintenance. In China, Huawei helped carriers release value-added cloud services for the commercial market such as small office and home office (SOHO), and these services doubled the ARPU and increased the proportion of first-time users to 60% of all new package users in one year. For chain retail enterprises in markets outside China, Huawei provided carriers with the Easy Branch solution. This integrated solution is designed for the multi-

branch scenario. It integrates a smart retail solution from Huawei Cloud and an electronic price tag solution from a third-party partner, and helps carriers increase their cloud service revenue.

Enabling Pervasive Intelligence to Lead the Way to an Intelligent World

Intelligence will greatly improve user experiences and energy efficiency for the telecom industry. In 2023, through non-stop innovation, Huawei provided carriers around the world with intelligent, efficient, and secure data storage products and solutions; helped carriers build DC-centric, agile, lossless, and elastic networks; and offered carriers one-stop, cloud-based application delivery solutions and Autonomous Driving Network (ADN) solutions, in order to continue to facilitate carriers' digital and intelligent transformation and accelerate our journey towards an intelligent world.

Enabling Carriers to Unleash Data Potential with Intelligent Data Infrastructure

Huawei provides the OneStorage 2.0 storage data lake solution. The solution realizes the transformation from device management to data management. It uses an innovative global file system (GFS) to implement visible, manageable, and flexibly flowing data, and helps carriers manage data elements as assets to unleash the value of data. By the end of 2023, Huawei had provided intelligent, efficient, and secure data storage products and solutions for many carriers.

- In China, carriers' intelligent computing centers have hybrid load requirements for data training in AI scenarios. Huawei provided an innovative storage solution to upload massive amounts of training data much more efficiently.

- In markets outside China, Huawei provided a state-of-the-art active-active storage solution featuring reliable network-attached storage (NAS). The solution ensures that enterprise resource planning (ERP) analysis reports run smoothly and improves system speeds by about 50%, to meet carriers' requirements for accelerated and stable core systems on the IT cloud. To meet carriers' requirements for developing 4K HD video services, Huawei provided a distributed storage solution for videos. This solution takes up 66% less equipment room space and reduces the energy consumption of data storage infrastructure by 12%. To meet carriers' constantly increasing requirements for backing up live-network core service data, such as billing data, Huawei provided a backup storage solution which builds a unified backup pool to make backup 50% faster.

Enabling Intelligent Networks with ADN

Building intelligent networks is an important strategy for carriers. 91% of carriers worldwide have incorporated automation into their corporate strategies and are aiming to reach Level 3 Autonomous Networks or above by 2025. By the end of 2023, 47 leading enterprises around the world had signed the *Autonomous Networks Manifesto*. Huawei uses its own ADN technology to help carriers improve network intelligence and accelerate the evolution toward highly autonomous networks.

- In China, Huawei worked with carriers to focus on increasing quality, revenue, efficiency, environmental sustainability, stability, and simplicity. Huawei has actively explored foundational technologies such as telecom foundation models and native intelligence for network elements (NEs), and implemented more than 10 technological innovations to evolve toward Level 4 Autonomous Networks.

- In markets outside China, Huawei has helped carriers deploy over 70 ADN applications, such as network energy saving, user experience assurance, intelligent troubleshooting, high-value customer exploration, and agile service provisioning. The iPowerStar solution has reduced power consumption for wireless networks. The intelligent Fault Management (iFM) solution has helped multiple carriers improve troubleshooting efficiency by 80%. The cell outage detection and compensation (CODC) solution has enabled base stations to automatically compensate for signals in poor weather conditions, ensuring uninterrupted network connectivity and improving customer satisfaction.

Enabling Carriers' Digital and Intelligent Transformation with Huawei Cloud Stack

In 2023, Huawei Cloud provided a distributed cloud foundation for global carrier customers on Huawei Cloud Stack. With its flexible deployment modes and business models, Huawei Cloud Stack helped carriers accelerate innovation in key internal IT applications, consumer-/home-/business-facing services, and intelligent services and increase revenue.

- **Accelerating carriers' migration of key internal IT applications to the cloud:** In markets outside China, carriers have used Huawei's full-stack, one-stop delivery services to smoothly migrate their core business systems, such as the billing system, to Huawei Cloud. Since then, they have been able to add advanced capabilities such as cloud-native services and big data to their systems, and realize their strategy of 100% internal applications on the cloud. By doing this, they greatly improved operational efficiency, and were able to roll out new services more than 30% faster.

- **Helping carriers increase the revenue from consumer-/home-/business-facing services:** Carriers in markets outside China used the ecosystem capabilities of Huawei Cloud's KooGallery to quickly replicate more than 120 services through software as a service (SaaS) applications, including digital government, smart education, and smart agriculture. In this way, carriers have helped accelerate the digital and intelligent transformation of numerous industries and have increased the revenue from consumer-/home-/business-facing services.

- **Facilitating carriers' innovation:** In China, Huawei has helped carriers innovate in fields such as operation, customer service, and R&D to improve user experiences. These innovations include smart assistants for cloud drives and gesture-based interactions on cloud phones. As a result, carriers were able to attract more than 10 million new users each year and increase the dataflow of usage (DOU) by more than 30%.

Enabling New Momentum in the AI Era with DC-centric Efficient Networks

Huawei helped carriers build DC-centric, agile, lossless, and elastic networks to meet industries' requirements for large computing power and large transport power and to help them stay competitive in the intelligent era.

- **Within data centers,** Huawei used its brand-new CloudEngine series switches and autonomous driving capabilities to provide customers with a hyper-converged data center network solution that helped carriers seize new opportunities presented by enterprise cloudification and computing power rental. The innovative network-scale load balancing (NSLB) algorithm nearly doubled network throughput and improved training efficiency by about 20% with the same number of servers.

- **Between data centers,** Huawei's elastic DCI solution provides customers with agile transport power services based on the all-optical foundation, intelligent elephant flow identification, and precise scheduling of tens of millions of flows, thereby improving network resource utilization from 40% to about 60%. One carrier has used this solution to transmit 500 TB of media materials to the data center for a film and television production company. Compared with the traditional solution, Huawei's solution shortened the transmission time from two weeks to just one day, and as such was able to meet user requirements for differentiated timeliness services of TB-level data.

Facilitating Digital and Intelligent Transformation to Enable New Growth

In 2023, Huawei set carrier transformation benchmarks for revenue increase from digital and intelligent transformation services, upgrades to O&M models for digital and intelligent transformation, and green and simplified infrastructure deployment. In addition, Huawei worked with carriers to unveil seven showcases in digital and intelligent transformation in O&M. These initiatives helped carriers accelerate their digital and intelligent transformation and create greater business value.

Tapping into the Potential of Innovative Digital Services to Increase Revenue

In 2023, Huawei launched the Mobile Money solution to help carriers improve the conversion rate of high-value users and accelerate the development of Micro Finance services. Huawei also launched the intelligent cloud customer service center based on converged data, and this has effectively improved user experiences in customer services and driven new revenue growth in carriers' business-facing services. In addition, Huawei launched the convergent billing solution, which uses intelligent technologies to help carriers monetize digital services more efficiently.

- In markets outside China, an auxiliary operation solution enabled by converged data rapidly converted about 57% telecom users into Mobile Money users and helped carriers develop more than 3 million Micro Finance users in two years. The convergent billing solution enabled a carrier to integrate multiple billing systems into one, which facilitated the launch of new converged marketing products within days. The number of new users increased six-fold in the first month after the product's launch.

- In China, Huawei helped carriers expand the business-facing service market using the intelligent cloud customer service center solution. This solution provided omni-channel, intelligent professional services for multiple industries such as government services, finance, retail, transportation, manufacturing, and energy, and helped carriers substantially increase their revenue.

Upgrading O&M Models to Enable Service Development and Experience Improvement

Carriers are leveraging converged data and foundation models to transform their O&M models from being network-centric to being service-centric. In 2023, Huawei built an intelligent operation engine based on SmartCare. By converging the data from the operations support system (OSS), business support system (BSS), and third-party public sources, the engine helped carriers optimize end user experiences and their network net promoter scores (NPS) and enabled service development. By the end of 2023, Huawei's digital and intelligent transformation solution for O&M had been applied in more than 200 projects around the world, continuously helping carriers achieve business growth.

- In markets outside China, Huawei's comprehensive digital and intelligent transformation solution for O&M, which features the collaboration of SmartCare, intelligent O&M, and network optimization, increased network traffic by about 8%, improved customer-experienced rates by about 40%, and shortened the mean time to repair (MTTR) by about 40%. In addition, the SmartCare-based intelligent operation engine helped carriers develop Mobile Money users, increasing the conversion rate of high-value users more than tenfold.

- In China, our customers used Huawei's network satisfaction modeling for end-to-end mobile network problem demarcation, location, rectification, and result evaluation to proactively manage network satisfaction problems and improve satisfaction rates.

Injecting Momentum into Infrastructure with Green Development

In 2023, Huawei provided a three-layer solution encompassing green sites, green networks, and green operations to systematically improve network energy efficiency and help carriers achieve More Bits, Less Watts. We helped carriers build simplified, efficient, intelligent, and low-carbon target networks. We worked together to apply this solution first to sites and then to networks, and we optimized target networks first in individual domains and then on a systematic basis. Huawei helped customers build new green data centers that anticipate the exponential growth of computing power in the future.

- In markets outside China, Huawei worked with carriers to digitally reconstruct the power systems of base stations using an intelligent optimization solution that coordinates the main equipment and auxiliary equipment. This greatly improved the stability and efficiency of the power supply for base stations. The power availability (PAV) increased to 99%, and the network traffic increased by more than 50%, which helped carriers increase revenue. Huawei also worked with carriers to successfully deploy 5G zero-carbon sites. Powered by solar power systems and lithium batteries, the sites are managed in real time by an intelligent network management system (NMS) which visualizes site energy efficiency (SEE) and helps significantly reduce annual carbon emissions.

- In 2023, Huawei released a full series of green data center solutions, including the hybrid architecture for air and liquid cooling and the converged power supply system. These solutions helped carriers deploy green data centers featuring high power density, the lowest possible power usage effectiveness (PUE), high reliability, and the ability to provide general and intelligent computing power. In China, carriers used our solutions to build efficient and reliable cloud data centers with high power density and diversified computing power. Our cabinets provide about 30% more capacity, which means there is more space for IT and this maximizes business value. Our efficient, energy-saving cooling systems help to reduce the annual PUE.

Staying Customer-centric and Providing Carriers with Services That Have a Positive Impact

In 2023, Huawei stayed customer-centric and provided our carrier customers with services that have a positive impact on the environment, society, and business. Huawei is proud to be the most trusted partner of carriers worldwide, and has continued to build a comprehensive service system of experts, talent, partners, platforms, and processes, while also continuing to create value for customers. Together, we are working tirelessly towards the goal of building a fully connected, intelligent world.

- Huawei continued to explore delivery modes that leverage digital and intelligent technologies, and built delivery capabilities suited to diverse scenarios. Our exploration and practices helped carriers efficiently build high-quality, green, simplified, resilient, and reliable ICT infrastructure to facilitate digital and intelligent transformation.

- Huawei worked with carriers to ensure the stable running of more than 1,500 networks around the world. Our stable and reliable communication assurance services have enabled users to enjoy high-quality networks at over 200 sports events and major activities. We worked side by side with our customers to overcome challenges during disaster relief efforts. Our agile and professional services helped to quickly recover network communication and reduce losses.

- Huawei helped carriers provide network services of high quality and exceptional experience. According to tests run by third-party authoritative institutions, carriers who used the products and network optimization services provided by Huawei ranked top in terms of network quality and user experience.

Enterprise Market

A new chapter in intelligent transformation is unfolding. And so, Huawei is working with customers and partners around the world to deeply integrate ICT with industry scenarios and spearhead the kind of innovation in ICT infrastructure that will drive digital and intelligent transformation and support a vast range of AI models and applications for all industries. Together, we are helping all industries go intelligent, and helping them do it faster.

Driven by customer scenarios and technological innovation, and always starting from top-level design, we focus on creating value for customers and guiding them throughout their digital and intelligent transformation journey. These efforts cover numerous sectors such as smart cities, finance, transportation, energy, manufacturing, education, healthcare, and Internet services. Based on our extensive experience in industrial intelligence, we have released a reference architecture that will drive industrial intelligent transformation, as well as a number of related solutions and a white paper titled *Accelerating Intelligent Transformation*, which offer practical advice and references that help industries make the most of intelligence.

We are committed to strengthening the breadth and depth of our strategy and have increased investment in the small- and medium-sized enterprise (SME) market. We have continued to optimize our "partner + Huawei" sales and service system and develop marketable products and solutions. In addition, we have launched HUAWEI eKit, a sub-brand dedicated to SMEs and micro enterprises, to better meet their requirements for digital and intelligent transformation.

A thriving and sustainable ecosystem is crucial for digital and intelligent transformation across industries. As such, we team up with partners to build a healthy ecosystem that advocates open collaboration for shared success, and grow with partners with shared benefits as the bridge, integrity as the foundation, and rules as the guarantee. We have developed more than 40,000 partners worldwide to help customers achieve business success.

A Wealth of Experience in Helping Governments and Enterprises Go Digital and Intelligent

Smart Cities

Huawei released the Architecture for Intelligent Transformation of Public Services in order to accelerate the intelligent transformation of public services to drive a cognitive society. We support the digital and intelligent transformation of government services, more efficient public services, and innovation in scientific research and help governments and public service customers around the world go intelligent, making public services fairer and more inclusive. We currently serve over 700 cities across more than 100 countries and regions.

We use "City Intelligent Twins" and a universal reference architecture and integrate multiple technologies to build new infrastructure that can act as the digital foundation for cities. We enable service innovation and work alongside partners to develop tailored solutions that significantly expand

the adoption of digital and intelligent technologies in public services. Focusing on the goals of ensuring high-quality and intelligent government services and improving service handling efficiency, we released foundation models for government services, government office applications, and city governance. We also continued to optimize our One-Stop Public Services Solution and Intelligent City Governance Solution. These models and solutions have significantly enhanced government service efficiency.

We have worked with customers and partners to build "City Intelligent Twins" and accelerate the intelligent transformation of cities. By the end of 2023, our "City Intelligent Twins" solutions had been implemented in more than 220 urban districts and cities across China as well as a number of cities outside China, creating people-friendly cities that can sense, think, and evolve.

Finance

Huawei jointly innovates and openly collaborates with financial institutions and partners, serving over 3,300 financial customers from more than 60 countries and regions.

- In the infrastructure domain, we help financial institutions build digital infrastructure that is highly stable, resilient, elastic, and agile by integrating multiple innovative technologies, thus comprehensively improving user experience, system resilience, and service security.
- We have delved deep into architecture transformation by releasing our Financial PaaS and fully upgrading the Digital CORE Solution 3.0, supporting the application modernization of more than 150 financial customers around the world.
- We released the Finance Foundation Model Solution and launched an upgraded version of the Financial Data Intelligence Solution 3.0. With these solutions, we have built enterprise-level data intelligence platforms for more than 200 financial institutions, making their decision-making and operations systems more intelligent.
- Our financial warehouse solution for inventory financing enables industrial finance innovation and drives growth of the real economy.
- We have stayed focused on the securities and insurance domains. Our next-generation core transaction solution for securities helps modernize core transaction systems, serving more than 10 stock exchanges and 100 securities traders around the world. We are also working with insurance customers to build their digital foundations.

Transportation

Huawei has continued to build its in-depth understanding of the transportation industry. We currently adopt an innovation-driven approach based on customer needs that focuses on transportation hubs and networks, as well as movement of passengers and goods to build a digital and intelligent foundation for comprehensive transportation and logistics systems. These are intended to support secure and efficient operations of both supply chains and value chains.

We work with partners to develop scenario-based solutions that create value for customers, facilitate smooth mobility and logistics, and help customers succeed through digital and intelligent transformation. We currently serve over 210 airports, airlines, and air traffic management authorities, more than 300 urban rail lines across over 70 cities, over 150,000 km of railways, a road network covering more than 200,000 km, and over 100 waterway and port customers. We help these customers continuously improve their transportation capabilities, supporting the transportation economy and ensuring digital transportation solutions remain secure.

Urban transportation and roads:

- We worked with customers to build an Intelligent Transportation System (ITS) that has continuously improved the management of urban traffic, improving overall traffic efficiency by 15%.
- We built a comprehensive transportation big data system along with a new management, control, and service model for integrated transportation.
- We expanded the adoption of intelligent technology in emergency response services related to in-service roads, reconstruction and expansion of roads, and toll systems to improve the safety and efficiency of the road network.
- We also built digital and intelligent platforms and conducted converged data governance to maximize data value and boost the transportation economy.

Urban rails and railways:

In 2023, we worked with customers and partners to expand the adoption of ICT in rail transportation,

aiming to build a secure and reliable digital and intelligent foundation which would further improve O&M efficiency.

- We launched the Urban Rail Cloud 3.0 solution which can help build fully connected urban rail networks that are secure, reliable, and simplified.
- We launched the Future Railway Mobile Communication System (FRMCS) solution that helps railway customers build high-reliability, high-bandwidth, and future-oriented train-to-ground wireless broadband networks.
- Our Smart Railway Trouble of moving Freight car Detection System (TFDS) Solution triples the operational efficiency of manual operations and has a comprehensive fault identification rate exceeding 99.3%.
- We also launched the Smart Railway – Perimeter Detection Solution to improve the security of railway assets and operations.

Aviation:

- We developed an Airport Cloud Solution that offers high-performance computing power and an open intelligent platform to support the secure migration of core airport services to the cloud.
- We also developed the Perimeter Security with Fiber Sensing Solution for smart airports. This solution guarantees full coverage over long distances, increases the optical fiber signal collection rate to 99.9%, and reduces false alarms by approximately 90%, ensuring 24/7 operational safety for airports.

Waterways and ports:

- We worked with customers to build multi-level port operations management platforms that enable digital, centralized, and cloud-based management of ports.
- Our Smart Gate Solution for smart customs leverages Huawei's products and services that offer powerful computing and low latency and support unified O&M. The solution slashes the average vehicle processing time at gates from 15 minutes to 10 seconds, significantly reducing port congestion during peak seasons.
- Our logistics cloud solution works together with customers' campus management solutions to improve logistics service experiences.

Energy

Electric power:

Huawei combines ICT with industry best practices and digital platforms for electric power scenarios. We have worked with partners to provide digital and intelligent solutions and services to nearly 200 power companies based on our Spark architecture, helping them move towards secure, efficient, green, and sustainable development.

Our foundation model for electric power has been successfully adopted in multiple scenarios, and our intelligent substation inspection solution has been put into use, successfully eliminating data silos and supporting real-time intelligent O&M.

- Our electric power communication network solution integrates the main communication network and power distribution communication network to build a scenario-based target communication network for customers, which delivers 99.9999% reliability and supports 1 ms latency in urban areas.
- We helped customers deploy more than 1,000 substations in China with our solutions like secure Grid Wireless LAN, field operations management, and edge intelligence, enabling a 60% jump in O&M efficiency.
- Our Intelligent Distribution Solution (IDS) helps customers enhance transparent sensing in distribution transformer districts and reduce the average outage duration by 42% and line loss by 1.4%, enabling a transition from single-point digitalization to architecture-based digital and intelligent transformation that is open, evolvable, and systematic.
- We worked with power companies to explore a new model of one fiber for multiple services, helping one customer expand its home broadband user base by 150%.
- An industrial park project that adopted Huawei's intelligent net-zero carbon campus solution won the 2023 Energy Globe World Award.

Mining:

Huawei has worked with customers and partners in the mining, smelting, and chemical industries to accelerate the realization of secure, green, and efficient operations.

- Our Pangu Mine Model now supports more than 40 application scenarios across nine specialized domains.
- We helped a steel company implement the world's first AI foundation model in the steel industry, which will soon support the implementation of 42 models targeting 21 scenarios.
- We worked with customers and partners to develop innovative applications for MineHarmony to rapidly drive the large-scale adoption of MineHarmony-powered equipment.
- Our remote control and autonomous driving solutions for open-pit mines have reduced the number of on-site workers by 80%.
- Our low-frequency 5.5G solution customized for mining was commercially deployed for the first time in 2023, supporting intelligent applications in five mining scenarios (i.e., transportation, mining, excavation, auxiliary transport, and power supply & drainage).
- We developed the Edge Intelligence Cloud (EIC) and Huawei Metaworks Digital Twin Platform in order to build next-generation integrated management and control platforms for mining.

Oil & gas:

Huawei launched an intelligent architecture for oil and gas, providing a new methodology for the industry's intelligent transformation.

- Exploration and development: We helped customers develop well logging foundation models to boost assessment efficiency and accuracy.
- Production: We launched the Intelligent Oil and Gas Fields Solution that covers wellsites and facilities to drive the optimization of oil and gas production and management.
- Storage and transportation: Our pipeline monitoring and warning solution provides warnings and prevents oil theft through the drilling of holes. This solution identifies different types of intrusions with an accuracy of over 95%, providing enhanced protection for oil and gas pipelines.
- Refinery: Our smart refining solution has helped customers build fully-connected 5G factories, improving product shipping and transportation efficiency by 30%, increasing the effectiveness of security risk management by 18%, and reducing carbon emissions and energy consumption by 15%.

Manufacturing, Retail, Real Estate, and Other Related Domains

Huawei leverages its own experience in digital and intelligent transformation and works with partners to support customers in manufacturing, retail, real estate, and other sectors as they continue their transformation journeys. Our solutions have been implemented by over 8,000 manufacturers and in numerous other domains like retail and real estate.

- Manufacturing R&D design: Huawei's R&D digital platform solution supports the end-to-end R&D process from defining product requirements to releasing products, helping carmakers, electronics companies, and many other companies boost product development efficiency.
- Manufacturing production: Our Intelligent Factory Solution architecture streamlines engineering data flows, business information flows, and production process flows. We also work with partners to implement intelligent applications such as advanced production scheduling, quality issue tracing, and digital twins, which support production model transformation, productivity improvement, and green and sustainable development.
- Retail: We have worked with our partners to develop a digital platform solution for sales. Based on the cloud-edge synergy model between Huawei's retail cloud and smart retail stores, the solution helps companies reduce construction costs, improve the operating efficiency and service quality at stores, and increase consumer satisfaction.
- Construction and real estate: We have worked with customers and partners to develop solutions for multiple scenarios like intelligent construction and intelligent buildings, in order to drive the intelligent, efficient, green, and low-carbon development of the construction industry.

Education

Huawei applies ICT to education to bridge the digital divide, drive equity in education, cultivate high-quality talent for universities and vocational schools, and accelerate innovation in teaching and scientific research. To date, we have served more than 5,000 education ministries, administrative organizations at all levels, colleges and universities, and research institutes in over 120 countries and regions.

- In higher education, we help universities build smart campuses and cultivate ICT talent for the future intelligent world. We are also driving industry-academia collaboration to bring research and application closer together. By the end of 2023, more than 40 of the QS World University Rankings' top 100 universities had chosen Huawei as their partner for intelligent transformation.

- In primary and secondary education, our solutions for high-speed inter-school network, education cloud platform, and smart classroom are helping drive equity and accessibility in education.

Healthcare

Huawei's intelligent healthcare solutions have served more than 5,000 medical institutions in over 110 countries and regions.

- In China, Huawei is contributing to digital and intelligent healthcare by participating in the construction of national health information platforms. Our solutions have been used in more than 600 telemedicine platforms as well as healthcare security information platforms at the national, provincial, and city levels and served more than 1,800 tertiary hospitals. Huawei has served 97 of the top 100 hospitals on the *2022 China Hospital Rankings* list released by the Hospital Management Institute of Fudan University.

- In regions outside China, Huawei is helping healthcare customers consolidate the foundation of digital transformation and drive universal healthcare access. We also support efficient and stable 24/7 operations for hospital core service systems and protect medical data throughout its lifecycle.

Internet Services

Huawei is committed to creating innovative technical solutions that make the most of our vast portfolio to provide Internet service providers (ISPs) and Internet companies with leading products, solutions, and services. To date, we have served more than 5,900 ISPs and Internet companies from more than 100 countries and regions, helping them build 10 gigabit, service-oriented, and intelligent ICT infrastructure.

- Home broadband: We have a full portfolio of home broadband products and solutions that help ISPs build elastic ultra-broadband networks capable of delivering superior service experiences and supporting intelligent operations. These offerings include solutions for gigabit fiber to the room, intelligent and simplified metropolitan area networks (MANs), and ultra-broadband backbone networks.

- Hosting services: Our network hosting and data center infrastructure hosting solutions help managed service providers (MSPs) build efficient, intelligent, and secure hosting service platforms for business success.

- Internet content services: Our solutions, like data center multi-architecture computing and ultra-broadband network, support collaborative innovation with Internet public clouds to help e-commerce, video, and other customers achieve service agility and rapidly expand their business.

Intelligent Campus

Huawei's portfolio solutions for intelligent campuses pre-integrate ICT technologies for campus scenarios to support industry digitalization. Together with our partners, we have used these solutions to serve more than 1,000 customers across various sectors, including government, education, healthcare, manufacturing, and stadiums, helping them build efficient, green, and convenient digital campuses.

In 2023, Huawei was named a leader in China's intelligent campus solution market by IDC MarketScape, thanks to its leading technology and architecture, full-lifecycle services, comprehensive ecosystem, large-scale commercial practices, and overwhelming influence on the industry. Other standout projects in 2023 included:

- In China, we worked with partners to help one large stadium go intelligent. We interconnected more than 40 of the stadium's subsystems and 18,000 of its device locations to provide first-class communications and security assurance, service and spectating experiences, and operations management for the stadium.

- In regions outside China, we worked with partners to build intelligent campuses for manufacturing companies by providing end-to-end campus portfolio solutions. For example, we helped customers build ICT infrastructure for campus management systems, access management systems, and campus networks that could be used to effectively manage the security of key assets, such as substations and pumping stations, and meet future business development needs.

Data Centers

Huawei has launched a series of portfolio solutions for scenarios like Centralized Cloud-DC, MultiDC, and LightDC to serve more than 300 customers in finance, government, and other sectors. These solutions will help build new green data centers that are more intelligent, more efficient, and more reliable.

We released the industry's first multilayer ransomware protection (MRP) solution based on network-storage collaboration to make data centers more secure and reliable.

The High Performance Database Solution (HDBS) provides another database option for customers' critical systems to support their business innovation. This year, we also worked with industry partners and customers to release the *White Paper on Database Transformation of Open Financial Platforms* which details the future trends we expect to see in the financial database sector.

We also released the *Data Center 2030* report, which proposes a reference architecture for new data centers that will drive the innovation and development of data centers worldwide.

Digital Sites

Huawei has developed a series of portfolio solutions for digital sites such as Digital Pole Site and Digital Pipeline to address customer needs like long-distance accurate sensing, intensive deployment of IoT networks, and edge intelligence. These solutions are leading the digital and intelligent transformation of outfield infrastructure.

- In intelligent highway and urban transportation scenarios, our Radar- and Video-based Management Pole Site Portfolio Solution supports travel safety by enabling long-distance sensing that is up to 95% accurate at 1,000 meters.
- In airport perimeter, railway protection, and oil and gas pipeline inspection scenarios, our Perimeter Protection Site Portfolio Solution improves security by supporting multi-dimensional sensing and accurate protection and has proven to reduce safety incident response times by 30%.

WANs

Huawei has developed WAN solutions for customers in multiple sectors including government, finance, manufacturing, energy, transportation, and ISPs. These solutions help customers build high-quality and easy-to-use networks.

We help government customers design the top-level blueprint and target architecture of "One City, One Network" to unify top-level plans and evolution paths regarding city networks and support the collaborative development of digital government, digital economy, and digital society. We have also released a "One Enterprise, One Network" target architecture and solution for large enterprises to support the intensive construction and service-oriented operations of networks, accelerating enterprises' digital transformation.

Helping SMEs Go Digital and Intelligent

In 2023, we continued to increase our investment in the SME market. We adopted a partner-centric approach where we worked closely with partners to help SMEs accelerate their digital and intelligent transformation.

Commercial Market

In the commercial market, our partner-centric strategy focuses on continuously optimizing our partner sales and service systems so that we can provide comprehensive sales and delivery support to our partners. This makes it easier for them to use Huawei products and solutions to independently serve their customers. In addition, we have created IT platforms for these partners, such as the eFly app and the official website for partners, based on their business journeys, making it easier for partners to attract new customers and provide quality services to customers.

We have focused on building an effective partner-led business model and helping SMEs rapidly go digital and intelligent by simplifying the integration, delivery, and O&M of our products and improving their cost effectiveness. In 2023, we customized a series of products and solutions for SMEs to better meet specific industry scenarios.

Distribution Business

In 2023, Huawei unveiled HUAWEI eKit, a sub-brand dedicated to SMEs and micro enterprises. This brand offers products designed for scenarios such as SME offices, budget hotels, and primary and secondary schools. Our HUAWEI eKit official website and HUAWEI eKit app provide a one-stop digital platform that supports the efficient operations of distribution partners.

Following the "distribution partner-led and subcontractor-centric" model, HUAWEI eKit has established a comprehensive distribution partner system and a healthy market and offers marketable products and portfolio solutions that are easy to buy, sell, install, maintain, learn, and use, as well as digital platforms and services. Through these actions, we aim to help our distribution partners tap into the unlimited business opportunities created by SMEs and micro enterprises going digital. Currently, Huawei's distribution business spans more than 70 countries and regions.

A Thriving, Symbiotic Partner Ecosystem and Global Service Capabilities

As always, Huawei works with our partners to consistently provide high-quality services to customers.

Partner Strategy

In the enterprise market, Huawei is committed to our long-term "Being Integrated" strategy, and adopts fair, just, transparent, and simple partner policies. We team up with partners to build a healthy ecosystem that advocates open collaboration for shared success, and grow with partners with shared benefits as the bridge, integrity as the foundation, and rules as the guarantee.

We have over 40,000 partners in the enterprise market, including more than 33,000 Acceleration Partners (i.e., Distributors, Resellers, Registered Sales Partners, and Distribution Partners) and more than 7,000 Association Partners (i.e., Consulting and Planning Partners, Solution Development Partners, Service Partners, and Business Operation Partners). Huawei and partners stay customer-centric and strive to co-build a customer-centric culture and mechanism. We aim to create a healthy business environment to grow together with partners and help customers succeed.

Huawei is committed to working with partners to develop leading industry solutions, integrating resources and complementing capabilities in the areas of market expansion, consulting and planning, solution development and integration, and delivery verification. As part of these efforts, we have opened 14 OpenLabs where we have collaborated to develop more than 200 scenario-based solutions.

Enterprise Services

Huawei's customer-centric core value inspires us to constantly improve the customer experience. Currently we collaborate with over 6,600 service and operation partners to provide a global service system for our key accounts, the commercial market, and the distribution business. Together, we consistently provide high-quality services to more than 56,000 customers worldwide, and support the secure and stable operation of over 120,000 customer networks. In 2023, we launched the online O3 Community through which we share our wealth of knowledge and experience with customers around the world. We have built a one-stop management platform for partners, to assist them with network operations and help them deliver world-class services to customers.

We will continue to increase our investment into services that drive digital and intelligent transformation across industries, improve our service capabilities, and develop ever more competitive service solutions, tools, and platforms. We aim to provide customers with a complete range of services for the entire solution lifecycle, from consulting, planning, design, and implementation to O&M support and optimization. In addition, we will continue to develop more training and certification services to cultivate more skilled professionals for industry digitalization and help accelerate industrial intelligent transformation.

Connectivity

As we stride towards an intelligent world, individuals, homes, and industries will raise unprecedented new requirements for connectivity. Individuals will need ubiquitous 10 Gbit/s connections for extended reality (XR), New Calling, and other emerging services. Homes will need 10 Gbit/s all-optical networks to support a growing range of smart services. As industries embrace digital and intelligent transformation, they will need a growing number of higher-quality connections, as well as differentiated experiences. At the same time, industries will raise new requirements for intelligent scheduling of computing power.

Wireless Network

- **Continuing to lead value creation in the wireless industry**
  - 5G is developing rapidly. By the end of 2023, more than 260 carriers were offering 5G services to more than 1.5 billon users in over 90 countries and regions. It took nine years for 4G to reach this number of users, but just five years for 5G to do the same.
  - 5G continues to drive digital transformation in a variety of industries. By the end of 2023, more than 65,000 5G private network projects and over 50,000 5G industry applications had been deployed around the world.
  - 5.5G is the next step of 5G evolution, and the industry has hailed the dawn of the 5.5G age. Evolving to 5.5G will benefit carriers because it will protect their existing investments in 5G and improve their network performance tenfold. New technologies, particularly passive IoT, will open up a new market of over 100 billion IoT connections, putting the industry on a path to realize a new development vision.
- **Full-series 5.5G products and solutions: Improving network capabilities tenfold, delivering optimal network efficiency, and enabling carriers' efficient and smooth evolution to 5.5G**
  - Huawei advocates "Native 10 Gbps", "Native Green", and "Native Intelligence". These are the key capabilities that carriers will need for multipath evolution to 5.5G across all available bands. Huawei's 5.5G GigaGreen full-series products and solutions can boost network performance tenfold through the use of state-of-the-art integrated software and hardware technologies, particularly the "Native 10 Gbps" ultra-wideband and multi-antenna technologies.
  - Huawei is committed to making 5.5G accessible in all scenarios. Our LampSite series solutions bring incredible 5.5G capabilities to indoor scenarios, addressing the needs of both consumer applications and a diverse range of industrial scenarios. In rural areas, our RuralLink solution eliminates the need for fiber cables and equipment rooms, providing ubiquitous coverage at an ultra-low cost and with minimal power consumption.
  - Huawei has translated its systematic innovations into the "Native Green" capabilities to realize "0 Bit 0 Watt", where wireless networks can work around the clock with minimal power consumption.
  - Huawei's IntelligentRAN enables carriers to upgrade to L4 autonomous networks that offer gains in cost reduction and efficiency improvement.
- **The world is ready for 5.5G: Global commercialization of 5.5G commences in 2024**
  - The characteristics of 5.5G have been defined: 10 Gbit/s downlink, 1 Gbit/s uplink, 100 billion connections, and native intelligence. 5.5G is ten times more capable than 5G in multiple areas while also offering various new capabilities. As a result, 5.5G is ideal for better connecting people, homes, things, industries, and vehicles.
  - The first commercial uses of 5.5G have already occurred outside China, and Huawei has been working with carriers to verify 5.5G's 10 Gbit/s capabilities and other key technologies (e.g., passive IoT) in commercial scenarios, in preparation for 5.5G commercialization in 2024.

Cloud Core Network

The large-scale commercial application of 5G gives rise to new services and scenarios, which in turn raise new requirements for networks. After more than two years of technological exploration, ecosystem

building, and standardization, breakthroughs have been made in 5.5G intelligent core networks, including in key technologies for 10 Gbit/s experiences and native intelligence. 5.5G intelligent core networks can provide service intelligence, network intelligence, and O&M intelligence to create new business value for customers. Extensive verification is underway around the world.

- **Service intelligence:** New Calling is an innovation born from service intelligence and has been commercialized in China. An open network architecture can transform conventional audio and video communications, making ultra-HD, interactive, and intelligent calling a reality.

- **Network intelligence:** An intelligent personalized experience solution can enable carriers to eliminate barriers to their experience-based operations, and better monetize services for which people expect differentiated experiences. Carriers can also provide ubiquitous 10 Gbit/s experiences by using high-throughput user plane functions (UPFs).

- **O&M intelligence:** Technologies like digital twin and foundation models are transforming O&M from a reactive approach, where engineers have to rely on disparate tools, to a more proactive approach, where engineers work more efficiently with intelligence. This transition makes delivery more agile and networks more resilient. Foundation models create multiple benefits for customers: They accelerate service rollout and guarantee operational security during network changes. They support digital employees that improve the efficiency and quality of O&M. In addition, foundation models can facilitate simulations to help customers identify network bottlenecks in advance and defend against signaling storms.

Optical

Huawei continues to innovate in optical transmission, optical access, enterprise optical networks, and many other areas. By cooperating with our customers, partners, and industry organizations, we are supporting the sustainable development of a green all-optical industry and turbocharging digital and intelligent transformation.

In November 2023, the European Telecommunications Standards Institute (ETSI) released F5G Advanced (F5G-A) standards. To address the needs of smart home and enterprise applications, Huawei has proposed a F5.5G all-optical target network architecture to provide 10 Gbit/s ultra-broadband. Huawei has also launched a range of technologies and products to bring F5.5G to life.

- **Optical transmission**

  In the age of intelligence, networks will need larger bandwidth, lower latency, and higher reliability than ever before. Huawei addresses these needs with Kepler, a DC-oriented OTN product. With the support of Kepler, a single subrack can deliver the required capacity to handle traffic surges. The product's innovative technology greatly increases network availability, reduces power consumption, and boosts network capacity and efficiency for better computing.

  Huawei has partnered with multiple carriers to commercialize 400G for ultra-long-haul transmission and 800G for medium-to-long-haul transmission.

  For the third consecutive year, GlobalData has ranked our OptiX OSN 9800 as the leader in its *Core Packet-Optical Platform: Competitive Landscape Assessment* and *Metro Packet-Optical Transport: Competitive Landscape Assessment* reports, and our OptiX OSN 1800 as the leader in its *Packet-Optical Access: Competitive Landscape Assessment* report.

- **Optical access**

  In response to new requirements for smart home connectivity, Huawei has upgraded its lineup of FTTR OptiXstar F30 products with enhancements in aesthetics, data rates, coverage, roaming, support for concurrent access requests, and service quality. Together with carriers, Huawei has delivered one-stop, premium services to bring more convenient digital lifestyles to end users. We have also unveiled the FTTR-B OptiXstar B30 series products, which make superior Wi-Fi connectivity available to micro and small businesses.

  We have also launched the industry's first commercial 50G PON solution, which supports GPON, 10G PON, and 50G PON on one port to enable smooth evolution towards 10 Gbit/s all-optical access networks.

At Network X 2023 (formerly Broadband World Forum), Huawei was honored with the Outstanding FTTH Service Award in recognition of its sustained leadership in the optical access industry.

- **Enterprise optical networks**

  Huawei has released the FTTO 2.0 solution for campus scenarios to create green, 10 Gbit/s all-optical campus networks. We have also unveiled an end-to-end optical service unit (OSU) solution to drive the evolution of production networks in various industries. To support industrial networking, we have launched the Lossless Industrial Optical Network solution to increase production quality and efficiency in industrial settings.

  Huawei's FTTO solution received the Outstanding POL Use Case Award at Network X 2023.

Data Communication

As digital and intelligent transformation continues across sectors, the data communication industry is reshaping network connectivity, experience, security, and O&M. Huawei is committed to making IP on Everything a reality. To this end, we provide customers with products and solutions – including High-Quality 10 Gbps CloudCampus, Super-Connectivity 400GE CloudFabric, Converged IP Transport Network, and Integrated Network Security – as well as Real-Time Network Digital Maps, which are instrumental to intelligent ultra-broadband network infrastructure. We have continued to work with customers, partners, and industry organizations to promote an industry consensus on Net5.5G and accelerate innovation in related business scenarios.

- **High-Quality 10 Gbps CloudCampus**

  The focus of campus network build-out has shifted to experience as enterprises continue to adopt digital and intelligent technologies, and new services and applications keep emerging. Huawei's High-Quality 10 Gbps CloudCampus solution stands out by offering three types of experience upgrade, namely wireless experience upgrade, application experience upgrade, and O&M experience upgrade. This solution is built on new technologies and capabilities like Wi-Fi 7 (for ultra-broadband access), audio & video experience assurance, and network digital map functionality. In 2023, Huawei's Wi-Fi 7 served customers in multiple industries, including education, healthcare, and public services. We received the Best Enterprise Wi-Fi Network Award from the Wireless Broadband Alliance (WBA).

- **Super-Connectivity 400GE CloudFabric**

  As foundation models gain traction and cloud-based data center architecture becomes a new norm, customers are looking to build and maintain data center networks that support both AI computing and general computing infrastructure. Huawei addresses this need with the CloudFabric 3.0 solution, which delivers ultra-powerful performance, ultra-fast deployment, ultra-high reliability, and ultra-intelligent O&M. CloudFabric 3.0 offers network-scale load balancing (NSLB), device-network collaboration, digital map functionality, and other advanced technologies that customers will need to build data center networks with high bandwidth, throughput, and reliability.

- **Converged IP Transport Network**

  Mobile broadband, home broadband, enterprise private lines, and enterprise campus services will gradually upgrade to 10 Gbit/s connections. Consequently, conventional IP transport networks need to evolve towards 400GE converged transport networks. This is where Huawei can help. Our full-service routers provide 400GE, SRv6, slicing, Network Digital Map, and other cutting-edge technologies that help carriers build networks with minimal TCO and achieve new growth in all of their service areas. In the enterprise market, Huawei's CloudWAN 3.0 – featuring a converged architecture – helps customers create agile, reliable, and intelligent WANs.

- **Integrated Network Security**

  Huawei HiSec 3.0 solution provides integrated security protection for clouds, networks, edges, and endpoints. This solution is a great fit for enterprise customers seeking to build resilient and secure networks.

Computing

An intelligent world is fast approaching, and we are seeing explosive growth in data and tremendous advancements in intelligent technologies. This has turned computing power into the new primary source of productivity. At Huawei, we are committed to open collaboration for shared success. Together with our partners around the world, we strive to build a solid computing backbone and a vibrant computing ecosystem.

Building the Foundation of the Computing Industry for a Digital and Intelligent Future Together

Over the past year, Huawei has continued to ramp up investment in the computing industry. Our strategy remained focused on "open hardware, open source software, partner enablement, and talent cultivation". With a focus on innovation in foundational software and hardware, we have worked with partners and developers to build a solid computing backbone that supports a vast range of models and applications and enables industries.

By the end of 2023, more than 6,300 partners and 5.7 million developers had joined the Kunpeng and Ascend ecosystems, and over 17,400 solutions had been certified. In addition, over 6,000 instructors and 700,000 students had been trained under the Intelligent Base industry-academia collaboration program.

In Kunpeng, we continued to dive deep into industry digitalization by pursuing full-stack optimization, enabling partners, and serving users. We have worked with our more than 4,700 partners to launch over 14,500 solutions that have been used extensively in core services across different sectors such as government, finance, and telecommunications. In 2023, the Kunpeng DevKit and the Kunpeng BoostKit were upgraded to boost performance for eight major scenarios. This improvement makes native development more efficient and service launch faster.

In Ascend, we continued to build leading training clusters and a complete series of inference products. We further opened up the heterogeneous compute architecture CANN 7.0 to unlock computing power and enable developers to develop their own high-performance operators. The past year has also seen a new development in the programming language that has reduced the average development time for a complex operator from two person-months to two person-weeks. By the end of 2023, more than 1,600 independent software vendors (ISVs) had used Ascend to launch over 2,900 industry solutions.

Huawei also continued to invest in open source communities, by working with industry partners to drive the development of the openEuler operating system, the openGauss database, and the MindSpore AI framework. By the end of 2023, the MindSpore open source community had served more than 5,500 enterprises, supporting the native training of over 50% of the industry's major foundation models.

Continuously Innovating to Build a High-performance, Reliable, Green, and Secure Data Storage Foundation

Digitalization has resulted in massive amounts of unstructured data entering production systems and turning into hot data. Foundation models and new applications are driving a data awakening, where data is quickly turned into assets. As a result, much more warm and cold data is being stored. The need to protect data has made data storage more important than ever across all industries.

- For critical enterprise applications, Huawei offers storage solutions that cover the entire data lifecycle, from data production to data backup and archiving.

  Our latest OceanStor Dorado All-Flash Storage powers the Geo-Redundant 4-Data-Center Disaster Recovery Solution that supports failover in seconds. In 2023, Huawei also made its CANTIAN storage engine open source in order to work alongside partners to build a new ecosystem around scale-out database storage that features storage-compute decoupling. To address the growing data security threats, Huawei's OceanProtect all-flash data backup appliance helps boost the security of data.

- For mass unstructured data, Huawei OceanStor Pacific Scale-Out Storage reduces the five-year total cost of ownership (TCO) by 20% compared with storage using hard disk drives (HDDs). In 2023, Huawei's OceanStor Pacific lineup topped the IO500 rankings.

For cloud and Internet data centers, Huawei launched OceanDisk Smart Disk Enclosure, a new type of disk enclosure that supports high-performance, energy-efficient, intensive, and robust storage and enables disks as storage media.

- To address the explosive growth of foundation models, Huawei launched high-performance storage that makes foundation model training data globally visible, manageable, and available and doubles the efficiency of data aggregation, preprocessing, and training. In addition, Huawei launched the FusionCube training/inference hyper-converged infrastructure (HCI) appliance to work with partners to develop solutions tailored for different industry scenarios. The appliance has lowered the threshold for the deployment and use of foundation models, which, in turn, accelerates their application in industries.

- Huawei also launched a Datacenter Virtualization Solution (DCS) and hyper-converged products that have been built on virtualization and containers to support virtualization and full-stack data center scenarios. These comprehensive infrastructure as a service (IaaS) and platform as a service (PaaS) products support data collection, storage, computing, management, and usage.

  In 2023, Huawei was recognized for the third year in a row as a Leader in the *IDC PRC Software-Defined Compute Market Overview and Analysis*.

- Our Data Management Engine (DME) helps customers more efficiently manage and optimize massive data assets by moving from equipment O&M to data management. DME delivers five-times higher O&M efficiency than traditional O&M methods.

Bringing Digital and Smart Office to Every Workspace and Every Person

In 2023, Huawei continued to explore smart office and smart education applications and launched its next-generation flagship IdeaHub ES2 Plus which is powered by an intelligent triple-lens camera and a high-precision PTZ. In addition, Huawei launched the dual-mode engine Multipoint Control Unit (MCU), adding to its diverse lineup of telepresence products. This engine supports collaborative office experiences for massive access with guaranteed security and reliability. It is already being used by customers across the globe.

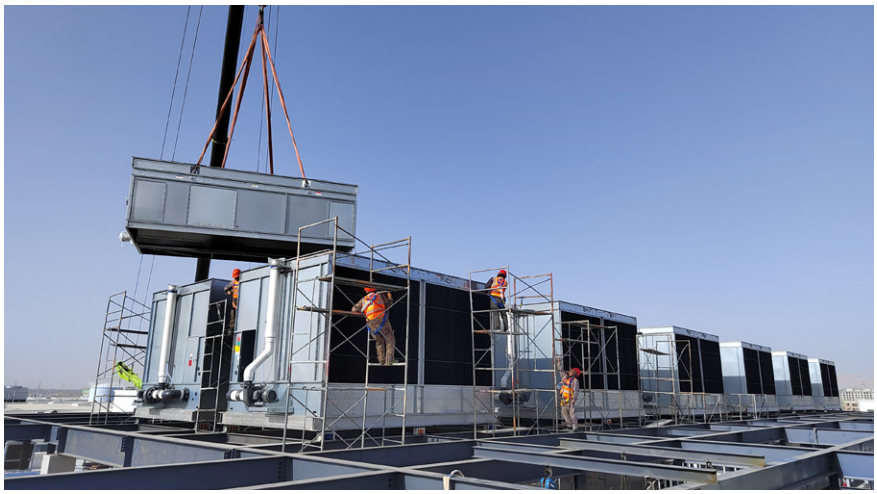
In intelligent collaboration, Huawei is a forerunner in smart office and has been a leader in professional audiovisual conferencing systems in the Chinese market for 11 years in a row.

ICT Services and Software

Huawei ICT Services and Software strives to keep leading, be the most reliable service partner, and build an intelligent world with the ultimate experience. Focusing on the entire business process from ICT infrastructure planning and construction to O&M, optimization, operations, and training, Huawei ICT Services and Software innovates continuously to provide a series of digital and intelligent service and software solutions. It aims to facilitate digital and intelligent transformation across industries by building green, efficient, secure, and robust ICT infrastructure that provides the ultimate experience.

Intelligent Connectivity Integration: Building Green, Simplified, and Resilient Networks

Energy efficiency and the ultimate experience are equally important for networks. Huawei has worked alongside industry partners to develop a standard for measuring the energy efficiency of green networks. As part of this effort, we released the *Green Management White Paper* and the *Resilient Network White Paper* to help build green target networks capable of smooth evolution. In 2023, our work helped reduce electricity consumption by around 640 million kWh.



A green data center that uses new technologies, such as full-stack liquid cooling, to realize efficient integration and optimal PUE.

By building simplified sites and introducing green power, we have reduced per-site energy consumption by over 35%. Through measures like modernization and smooth service migration in legacy networks and equipment rooms, we have helped customers reduce energy consumption by more than 30%, increase network traffic by over 15%, and explore ToH and ToB services. In addition, we have improved network architecture to enhance network resilience, further reducing the fault rate during network changes.

Intelligent IT Integration: Building Diversified Computing Centers in the Intelligent Era

Over the past year, Huawei has continued to innovate in terms of data center integration to meet the requirements for diversified computing power in the intelligent era, provide fast computing services for more than 1,000 enterprises, and help accelerate industry innovation. We have also continued to use innovative technologies such as prefabricated and assembled modules, full-stack liquid cooling, and multi-domain collaborative planning and integration to quickly build greener data centers that offer higher computing power. In 2023, Huawei was honored with the China Green Demonstration Project Award for its efforts in building data centers that provide optimal power usage effectiveness (PUE).

Customer Support: Underpinning Intelligent Connectivity

Relying on our global technical service centers and over 6,000 maintenance experts, Huawei provides 24/7 support services for customer networks in nine different languages. We have worked with partners around the world to support the robust operations of thousands of networks for carrier and industry customers. We always go wherever our customers need us, offering warm and professional services that support robust network operations, even in the face of natural disasters such as earthquakes, typhoons, and floods, or during major sporting events. We have introduced new technologies such as AI and Digital Twin into our solutions to provide risk prediction and prevention capabilities. These efforts, alongside regular contingency plans and drills, have helped ensure network resilience.

Intelligent Operations: Advancing the Transformation from Network-Centric to Service-Centric O&M

In 2023, Huawei AUTIN™, along with TM Forum and leading carriers, released *New-Generation Intelligent Operations: The Service-Centric Transformation Path*. This white paper explores ways in which communications service providers (CSPs) can increase

network benefits by transforming from network-centric to service-centric O&M. In 2023, Huawei continued working with carriers on projects to drive digital O&M. We received TM Forum's Excellence Award in the Market Innovation Category and the Driving Digital Transformation Award at the Global Telecoms (GLOTEL) Awards.

SmartCare: Delivering Leading Network Performance and the Ultimate Experience to Unleash the Value of Data

Huawei continued to innovate in terms of network performance and service experience to help carriers provide leading network performance and a superior user experience and protect brand value. Huawei and TM Forum jointly released the *Digital Twin for Decision Intelligence (DT4DI)* white paper which provides a reference architecture for the new phase of digital and intelligent transformation. In 2023, we worked to improve the user experience of typical over-the-top (OTT) applications, helping carriers monetize user experience. We also worked on converged data analysis and modeling to support marketing efforts and help quickly develop new users and services. In addition, we applied core technologies to a number of industry scenarios, such as smart mining and smart city, to enable digital and intelligent transformation and improve both efficiency and benefits. In 2023, Huawei was among the winners of the Future Enterprise Awards presented by IDC China for an intelligent management platform jointly built with a mining customer.

Intelligent Digital Service: Enabling New Growth

Huawei continued to innovate digital platforms and services to support new growth:

- Huawei's new cloud-native convergent billing solution (CBS) comes equipped with intelligent offering design capabilities that significantly shorten the time to market (TTM) for new offerings. CBS was placed in the Leaders quadrant for competitiveness according to GlobalData's *Revenue Management: Competitive Landscape Assessment*.
- By introducing new technologies like large language models, Huawei's AI contact center (AICC) solution helps customers from a range of sectors like communications, finance, and government redefine call center service experiences through upgrades to interactive user experiences.
- Huawei Mobile Money provides innovative services such as mobile wallet and micro finance for emerging markets, enabling more users to enjoy inclusive financial services. In 2023, Huawei was the Gold Award Winner in the Best Mobile Money Offering Category presented by Juniper Research.

Huawei Learning: Cultivating New Talent with Digital Skills

In 2023, Huawei built systematic talent development services covering talent planning, cultivation, assessment, and operation, aiming to cultivate new talent needed for the intelligent era.

- Talent cultivation for carriers: We worked with global carriers to provide workshops and enablement sessions on topics such as strategy and leadership. Through scenario-based hands-on practices and certification, Huawei cultivated over 32,000 ToB professionals for carriers in 2023.
- Talent cultivation for industries: Huawei provided training for various industries such as mining, finance, transportation, electric power, and manufacturing. In 2023, we cultivated over 23,000 technical professionals for more than 100 enterprises.
- Talent cultivation for the public domain: Huawei developed a leading ICT talent cultivation system and related standards to help ICT professionals advance their careers. In 2023, more than 100,000 participants of our training programs received Huawei's ICT certifications.

By the end of 2023, Huawei had cultivated more than 3.3 million ICT professionals worldwide, with more than 850,000 participants receiving Huawei's ICT certifications.

Cloud Computing Business

We are fast approaching the intelligent world. Innovative ecosystems underpinned by cloud and technologies represented by foundation models are reshaping industries at an unprecedented speed and generating new momentum for building an inclusive, accessible, and resilient digital world.

Huawei Cloud is continuing to implement the Everything as a Service strategy and provide customers, partners, and developers with stable, reliable, secure, trustworthy, and sustainable cloud services. We strive to serve as the cloud foundation and enabler of industry digitalization, as well as to accelerate the intelligent transformation of industries and provide the fertile soil for a flourishing ecosystem.

Cementing Our Roles as the Cloud Foundation and Enabler of Industry Digitalization and Achieving Rapid Growth in the Global Market

Huawei Cloud's continuous investment in innovation has led to our rapid business growth in 2023. By the end of 2023, Huawei Cloud had covered 30 geographical Regions and 84 availability zones (AZs), and provided services for customers in more than 170 countries and regions.

Within China, Huawei Cloud has been focusing on industry digitalization scenarios. We have already supported more than 800 e-Government cloud projects, and have helped more than 160 cities implement the One City, One Cloud initiative. We have served China's six major banks, 12 joint-stock commercial banks, and the top 5 insurance institutions. 90% of the top 50 e-commerce companies, 90% of the top 50 gaming companies, and 90% of the top 30 automakers in China have also chosen Huawei Cloud.

In markets outside China, Huawei Cloud continues to accelerate the construction of KooVerse, our global cloud infrastructure, in order to deliver quality cloud services and consistent experience globally. Huawei Cloud has taken a By Local, For Local approach and provided customers with cutting-edge technologies and localized services, to empower them on their own digital transformation journeys. In 2023, Huawei Cloud maintained rapid growth in regions outside China and has become a trusted cloud brand for customers in markets including Asia Pacific, Latin America, the Middle East, Africa, and Europe.

In Asia Pacific, Huawei Cloud has become one of the best partners for enterprise digital transformation. We have local service teams in more than 10 Asia-Pacific countries and regions. Thailand's Government Data Centre and Cloud Service (GDCC) project used Huawei Cloud Stack to build a National Telecom Cloud. This e-Government cloud has made it more convenient for Thai government departments to develop digital services and provide better public services.

In Latin America, Huawei Cloud is the cloud service provider with the most nodes in the region. Huawei Cloud promotes the digital transformation of thousands of local customers in industries such as finance, media, retail, logistics, and Internet. Chile's SMU Group, for example, has fully migrated their core systems to Huawei Cloud. They are now embracing a cloud-native upgrade and are able to carry out omni-channel business innovation faster.

In the Middle East, 2023 marked Huawei Cloud's first year of local cloud services in Saudi Arabia. Our products offer exceptional reliability and network latency. Huawei Cloud has successfully delivered an Arabic natural language processing (NLP) model with 100 billion parameters for one of our Saudi Arabian customers, and this has helped the customer build a green, intelligent, and efficient foundation that powers various applications. Huawei Cloud also helped the Al Jasser Group migrate its enterprise resource planning (ERP) system to the cloud, which increased the monthly transaction processing capacity by about 30% and enabled the rapid launch of new service outlets.

In Southern Africa, Huawei Cloud has become the first cloud service provider to operate local data centers. We provide cloud services for 14 countries in Southern Africa, in sectors such as government services, telecommunications, finance, manufacturing, mining, education, Internet, retail, and logistics. The University of Zululand (Unizulu) in South Africa, for example, migrated its service system to Huawei Cloud, and has since been able to significantly improve its teaching management, academic evaluation, exam management, anti-cheating management, and security management.

In Northern Africa, Huawei Cloud launched innovative AI and big data services locally, including the Arabic automatic speech recognition (ASR) service that supports the Egyptian dialect, to help customers accelerate innovation and upgrades. In addition, Huawei Cloud worked with partners to build solutions for local enterprises. Huawei Cloud worked with Intella to build an Arabic model covering all 25 Arabic dialects, with a speech recognition accuracy of up to 96% and a word error rate as low as 10%.

In Europe, Huawei Cloud started to provide local cloud services in Türkiye in 2023. So far, Huawei Cloud has worked with our partners to serve more than 3,000 enterprises in Europe. We have developed 1,000 local partnerships, and these partners worked with us to provide stable, reliable, secure, compliant, and innovative cloud services for various industries in Europe, and to help European enterprises accelerate their digital and intelligent transformation.

Pressing Ahead with Tech Innovation to Give the World a Better Alternative

Huawei Cloud continues to invest heavily in R&D, and leverages Huawei's more than 30 years of ICT expertise and product solutions to build the best cloud foundation in the intelligent era through systematic innovation. We have built five pipelines for data governance, AI development, digital content production, software development, and hardware development, to make innovation easier and to accelerate industries' digital and intelligent transformation.

Systematic innovation: Building a solid cloud foundation for computing

In 2023, Huawei Cloud released the distributed QingTian architecture. QingTian goes beyond the boundaries of computing, storage, and networking, and implements a new-generation fully interconnected, peer-to-peer architecture for diversified computing power that will future-proof infrastructure for the all-cloud era.

Huawei Cloud is also continuing to upgrade our basic cloud services. Our newest generation of computing instances deliver over 50% higher computing power, which translates into more cost-effective diversified computing services for customers. The AI cloud storage solution uses a three-layer cache architecture for associated acceleration, which enables 90% faster data preparation for AI training. This storage solution is a key component for the construction of the best data foundation for the AI era.

To provide a more secure and stable cloud experience, Huawei Cloud has built a security system with one center and seven lines of defense. The SecMaster security operations platform has a built-in AI security model which can handle 99% of alarms within 5 minutes in a closed-loop manner. Our deterministic O&M system ensures over 99.99% service availability on live networks and safeguards networks and services around the clock.

The DataArts data governance pipeline: Data and AI convergence is helping enterprises to unlock data value faster

Huawei Cloud DataArts is a one-stop development and governance platform featuring data and AI convergence on the cloud. It provides enterprises with cloud-native, integrated lake-warehouse, and decoupled storage-compute cloud service portfolios. DataArts includes the GaussDB distributed database, the MapReduce Service (MRS) cloud-native data lake, the Data Lake Insight (DLI) fully managed serverless service, the GaussDB(DWS) all-scenario one-stop data warehouse, and the DataArts Studio, which is a service for data governance centers that we have designed based on Huawei's own experience in digital transformation. Huawei Cloud DataArts has helped to accelerate digital transformation in multiple industries including government services, finance, telecommunications, and the Internet industry.

In 2023, Huawei Cloud officially released GaussDB, the next-generation distributed database. GaussDB builds its core technical competitiveness around high availability, intelligence, elasticity, security, performance, ease of deployment, and ease of migration. It has passed the Common Criteria (CC) Evaluation Assurance Level 4+ (EAL4+) certification, which is the highest level available for database security, and has been widely used in many fields such as banking, insurance, and energy. MV, a Brazilian medical information company, migrated its database to GaussDB, and this improved its medical record query speed from 3 seconds to 0.5 seconds.

The ModelArts AI development pipeline: Lowering barriers to industry-specific application and accelerating innovation in foundation models

ModelArts is a one-stop AI development platform on Huawei Cloud. It provides enterprises with technical capabilities throughout the AI application development pipeline. These capabilities include data processing, algorithm development, model training, model management, and model deployment. Together, they have made AI application development faster and implementation easier.

In 2023, Huawei Cloud stayed true to our AI for Industries strategy, and released the Pangu Models 3.0 and the Ascend AI cloud service. Pangu models focus on solving the complex, enterprise-level R&D, production, supply, sales, and service problems. Pangu has been implemented in multiple domains such as finance, government services, manufacturing, mining, automobiles, medicine, meteorology, and railway industries. It combines industry know-how with foundation model capabilities and is already dramatically reshaping entire industries.

Based on our three AI cloud computing centers in China's Gui'an, Ulanqab, and Wuhu, the Huawei Cloud Ascend AI cloud service provides massive, stable, reliable, and on-demand AI computing power for industries. The Ascend AI cloud service consistently offers a stability rate of up to 90% over 30 days for training foundation models, and recovery within 10 minutes of an interruption, and as such it effectively supports the innovation of a wide range of models and applications in the AI era.

The MetaStudio digital content production pipeline: Building cloud-native media infrastructure to unleash digital content productivity

Huawei Cloud provides a full range of media service capabilities, including the MetaStudio digital content production pipeline, media engines, and media networks. Huawei Cloud also works with ecosystem partners to build scenario-specific solutions and foster a prosperous digital content ecosystem on the cloud.

In coal mining, the Pangu mining model has already been extensively used in eight mines. One model covers more than 1,000 sub-scenarios in business processes such as mechanized mining, excavation, electromechanics, transportation, ventilation, and coal washing. It not only offers a more comfortable working environment for coal workers, but also greatly reduces the number of accidents, and also improves production quality and efficiency.
Based on Huawei Cloud Stack, our hybrid cloud, Shandong Energy Group has successfully built the coal industry's first mining model – the Pangu mining model. It has been used to develop and implement AI applications in 26 of Shandong Energy Group's subsidiaries, and now covers more than 40 application scenarios in 9 business processes. This brings us one step closer to scenario-specific large-scale AI applications in the mining industry. For example, monitoring hole depth in anti-impact and pressure relief construction is a typical application in the coal mining industry. The Pangu model has been used to monitor hole drilling in real time, and it has reduced manual inspection workloads by 80%.

In meteorology, Huawei Cloud's Pangu weather model was the first AI model to be more accurate than traditional numerical forecasting methods. The Pangu weather model can provide global weather forecasts in just seconds. In July 2023, the esteemed science journal *Nature* published a paper about the research results derived using Huawei Cloud's Pangu weather model. The Pangu weather model is highly recognized as the research results clearly demonstrate how the Pangu weather model will revolutionize weather forecasting in the future, and that opening the model will drive the development of this field. On September 18, 2023, Huawei Cloud announced that it would work with the Meteorological Bureau of Shenzhen Municipality on regional weather forecast models. Global and regional analyses are used as real-time inputs into global and regional forecast models. These models can quickly generate local weather forecasts such as the next five-day temperature and rainfall forecasts for Shenzhen and surrounding areas, with a spatial resolution of 3 km. In the future, these models will provide finer-grained weather services for industries such as transportation, water services, and tourism.

Based on the Pangu virtual human model, Huawei Cloud MetaStudio helped villagers in Danzhai, China's Guizhou province, to quickly build digital avatars. It only takes a five-minute video of a person and one day to generate an avatar of that person for livestreaming. The avatar can accurately and fluently introduce the products and interact with audiences in real time.

Based on MetaStudio and the Pangu virtual human model, which has been trained using petabytes of audio and video data, Huawei Cloud provides services such as virtual human video production, video livestreaming, and intelligent interactions. These services have been widely used in industry scenarios to make marketing campaigns, support e-commerce livestreaming, and facilitate intelligent customer services. With the help of Huawei Cloud's virtual human services, many enterprises, such as Hsu Fu Chi and Wondershare, have used interactive 24/7 livestreaming in multiple languages to create new growth in their retail and cross-border e-commerce businesses.

For media networks, Huawei Cloud has 2,800 content delivery network (CDN) edge nodes worldwide and a reserve of more than 180 Tbit/s bandwidth across all networks, which it uses to build a highly reliable, global, low-latency, real-time interactive media network. This network offers an end-to-end livestreaming latency of less than 500 ms. Huawei Cloud has provided scenario-based solutions such as edge security, efficient transcoding, and application acceleration for customers including China's Huya, Thailand's BBTV, and Türkiye's BluTV.

The CodeArts software development pipeline: Reshaping software development with full-stack intelligent toolchains

Huawei Cloud CodeArts is a one-stop software development platform. It integrates Huawei's more than 30 years of R&D best practices with the cloud to provide enterprises and developers with secure, trustworthy software development services throughout the entire development process.

In 2023, Huawei Cloud added more than 20 innovative proprietary software tool services to CodeArts, including CodeArts Req (for requirement management), Check (for code check), and TestPlan (for test management). These tool services cover the entire software development lifecycle, from requirements, design, and development, to testing, deployment, and O&M, thereby building a fully cloud-based software development process.

Huawei Cloud also released the CodeArts Snap intelligent development tool. CodeArts Snap is based on the Pangu R&D model and can generate code with just one instruction, comment out code and generate test cases after just one click, and intelligently deploy code upon just one command. It empowers each software developer by serving as their personal programming assistant.

The CraftArts hardware development pipeline: Building a new-generation industrial software system to improve hardware development efficiency and experience

In 2023, Huawei Cloud worked with industry partners to release the CraftArts hardware development pipeline to accelerate the building of a new-generation industrial software system. Based on a unified data foundation driven by data models, CraftArts provides enterprises with one-stop IT toolchain services for hardware design, development, simulation, and trial production. CraftArts includes the board-level electronic design automation (EDA) toolchain, structure design toolchain, industrial simulation toolchain, and the design and manufacturing

convergence platform. Through innovations in collaboration modes and by upgrading algorithm engines, CraftArts improves the efficiency of industrial software processing and enables efficient innovation in enterprise hardware R&D. Currently, about 200,000 hardware developers are using the CraftArts development tools on Huawei Cloud every month.

Working with Partners and Developers to Build a Thriving Innovation Ecosystem on the Cloud

Huawei Cloud envisions an ecosystem that is Of All, By All, and For All. Huawei Cloud is accelerating the development of an ecosystem that aggregates industry applications and supports global developers and partners. Together, we are building a thriving ecosystem to facilitate innovation on the cloud. By the end of 2023, Huawei Cloud had developed more than six million developers around the world, attracted more than 40,000 partners to our ecosystem, and launched more than 10,000 applications in the KooGallery cloud marketplace.

Huawei Cloud has also been working with global customers and partners to provide eight industry aPaaS services for industries covering manufacturing, finance, government services, transportation, electric power, and mining. We also provide core aPaaS services including KooMap (for digital twins), KooPhone (for cloud phones), KooDrive (for cloud storage), KooMessage (for digital marketing), and KooVehicle (for commercial/dedicated-purpose vehicles). Together, we have released more than 150,000 APIs to help accelerate application innovation across industries.

Building a developer-centric, open ecosystem

In September 2023, Huawei Cloud announced the plan to build an open, dynamic, and innovative ecosystem for foundation models, and officially launched a dedicated zone for foundation models on the Ascend AI cloud service, as well as setting up a model community for developers. These initiatives support the Pangu foundation models, the industry's mainstream open-source foundation models, and third-party commercial models. Enterprises and developers can quickly create their own model applications and as such can remain competitive in the foundation model era.

Using the cloud as a foundation, Huawei Cloud has continued to collaborate with the Kunpeng, Ascend, openEuler, HUAWEI Mobile Services (HMS), and HarmonyOS ecosystems to build a diversified developer ecosystem on the cloud. Through more than 160 innovation centers around the world and the Huawei Cloud Developer Program, Huawei Cloud provides services such as Developer Technical Support Engineer (DTSE) and technical certification. In addition, through the Huawei Cloud Academy, Huawei Cloud cultivates developers and encourages them to join the Huawei Cloud ecosystem.

Building an ecosystem partner system for shared success

In 2023, Huawei Cloud established a Huawei Cloud partner system focused on customer scenarios and supported by ecosystem solutions. Partners have already built 324 joint solutions with Huawei Cloud. Huawei Cloud launched the Service Partner Program to recruit and cultivate more service partners with core cloud capabilities. We released the System Integrator (SI) Path to help partners quickly build end-to-end capabilities for industry digital transformation using Huawei Cloud. We also launched the Partner Customer Engagement (PCE) program to align our business goals with those of our partners and share market opportunities. In addition, Huawei Cloud released the Go Cloud, Go Global ecosystem plan in regions such as the Middle East, Latin America, and Europe to share our localization experiences and global ecosystem capabilities with our partners.

For startups, Huawei Cloud has invested more than CNY100 million in building a global startup ecosystem that has helped more than 3,000 startups around the world innovate using Huawei Cloud. More than 100 Chinese startups have also expanded to markets outside China with the help of this ecosystem.

The KooGallery marketplace: Building the best application distribution platform on the cloud

Huawei Cloud is determined to develop KooGallery into the best platform for application distribution and one-stop B2B application purchases. By the end of 2023, more than 7,000 stellar partners had launched applications in Huawei Cloud's KooGallery. They had released more than 10,000 applications in more than 60 categories, covering over 10 industries including manufacturing, education, government services, mining, and finance, and serving more than 500,000 enterprises and developers worldwide.

Digital Power Business

Carbon neutrality will drive a profound transformation in both society and the economy. It will require a robust energy infrastructure that powers decarbonization, electrification, digitalization, and intelligence. We are entering a new world where digital energy will play a key role. Huawei Digital Power integrates bit, watt, heat, and battery (4T) technologies to develop new energy infrastructure for power systems, electric vehicles (EVs), and the digital industry. We focus on renewable energy, mobility electrification, and digital transformation to drive carbon neutrality.

By the end of 2023, Huawei Digital Power has helped customers generate 997.9 billion kWh of green power and save 46.1 billion kWh of electricity. These efforts have reduced CO_2 emissions by 495 million tons, equivalent to planting 680 million trees.

New Energy Infrastructure for Power Systems

We have launched FusionSolar smart PV and energy storage system (ESS) solutions that address utility-scale plant, commercial & industrial (C&I), and residential scenarios. These solutions are helping to develop a new energy infrastructure for power systems.

- Huawei's smart string & grid-forming ESS solution significantly improves a power grid's ability to integrate renewable energy by reshaping voltage, frequency, and power angles. This can help address challenges arising from having high shares of renewable energy integrated into the grid at utility-scale plants. We have also combined IoT, big data, AI, and other new ICT solutions to improve O&M by automating the fault diagnosis process for smart power plants.

- For C&I scenarios, we have developed a one-stop C&I Smart PV & ESS Solution that delivers active safety, optimal electricity costs, long-term reliability, simplified O&M, and optimal revenue. This solution includes optimizers, smart PV controllers, ESSs, chargers, electrical loads, smart microgrids, and smart PV management systems. The solution is designed to support sustainable business operations, and help industries go green and low-carbon.

- For residential scenarios, we have created a Residential One-fits-all Solution with a "1 + 4 + X" design that can help users increase their own utilization of PV power and transform households from energy consumers to energy prosumers. This solution includes an inverter ("1"), optimizers, ESSs, chargers, and management systems ("4" core products), and the ability to enable an unlimited number ("X") of home appliances. One villa in Spain, for example, has used Huawei's one-fits-all solution to increase the share of green power in its total power mix and achieve a solar self-consumption rate of nearly 100%. This solution includes a 6 kW PV system, optimizers configured for all PV modules, a 10 kWh ESS, chargers, and an energy management assistant (EMMA). The optimizers have helped increase the installed PV capacity by about 60% by fully utilizing all available roof area, which is shaded by the air conditioners and parapet walls. EMMA's intelligent energy scheduling function allows it to flexibly optimize the scheduling of generated PV power according to changes in local electricity prices and weather, and power consumption load, thus maximizing the value of the PV and ESS systems. Furthermore, the PV Power Preferred mode can be enabled for chargers, ensuring PV power is preferentially used for charging.

Safety is the cornerstone of high-quality development within the PV industry. Huawei has implemented a four-dimensional safety solution to ensure the long-term safety and stability of power systems. We will continue to work with industry partners, customers, and ecosystem partners to build a new power system based on renewable energy, and help make PV a main energy source.

The Red Sea Project in Saudi Arabia is the world's first GW-level standalone microgrid project that is fully powered by renewable energy. The project uses Huawei's FusionSolar smart PV and ESS solution, including a 400 MW PV system and a 1.3 GWh microgrid ESS that were successfully connected to the grid in October 2023. To cope with the complex local power grid environment, the project has used Huawei's smart string & grid-forming ESS to build an independent and resilient power grid that can adapt to changing conditions. This project will supply power to over one million tourists every year.

In January 2023, Huawei, together with China Resources Power, China Electric Power Research Institute, and the Electric Power Research Institute of State Grid Qinghai Electric Power Company, piloted the world's first grid-forming battery energy storage system (BESS). They completed more than 180 grid connection tests, including for large frequency disturbances and large voltage disturbances, for strong grids. In October 2023, Huawei, China Energy Qinghai Electric Power Company, China Electric Power Research Institute, and the Electric Power Research Institute of State Grid Qinghai Electric Power Company jointly completed a series of tests on the grid-forming BESS for weak grids. This has set a global benchmark for large-scale integration of renewable energy into power grids.

Mahidol University in Thailand has built Asia-Pacific's largest single-site C&I PV and ESS plant, which includes a 12 MW PV system, a 600 kWh ESS, and optimizers configured for all PV modules from Huawei FusionSolar. The plant fully complies with Thailand's new national electrical safety code, setting a milestone for the large-scale application of PV and ESS integration in Thailand.

New Energy Infrastructure for EVs

Huawei has positioned itself as a provider of e-Mobility and Smart Charging Network solutions in the mobility electrification industry. Our collaborative development approach focused on quality has allowed us to launch hyper-converged e-Mobility solutions and fully liquid-cooled ultra-fast charging solutions. These solutions are accelerating mobility electrification by building a new energy infrastructure for EVs that makes charging as easy as refueling.

Smart Charging Network

Huawei is committed to building a high-quality smart charging network that delivers superior user experiences and excellent benefits. Together with our customers and partners, we want to make high-quality charging resources available everywhere. We have already worked with various industry associations to release industry white papers and standards, such as the *White Paper on the Sustainable Development of High-Quality Charging Facilities* and the *Specifications for Grading and Evaluating Electric Vehicle Charging Station Facilities and Services*. These are part of our broader efforts to promote the sustainable development of high-quality charging facilities.

November 2023 marked the one-year anniversary of Huawei's launch of the world's first fully liquid-cooled ultra-fast charging station at the Waxi (Eastward) Service Area of the Shantou-Zhanjiang Expressway. Since its launch, the station has experienced no service disruptions, and its O&M cost has dropped by about 90% year-on-year. By the end of November 2023, this station had provided a total charging capacity of approximately 1.16 million kWh and served more than 40,000 cars. Its turnover rate had more than doubled, setting an industry benchmark for fully liquid-cooled ultra-fast charging demonstration sites.

In September 2023, Huawei and its partners deployed fully liquid-cooled ultra-fast charging stations in Tianquan, Litang, and Sangdui, creating a Super Charging Green Corridor along the high-altitude G318 Highway. Heat dissipation is often a bottleneck in environments with low air pressure. Huawei has developed an innovative liquid-cooled technology that ensures ultra-fast high-power charging in these types of places. This technology can also improve long-term equipment reliability.

DriveONE

Huawei DriveONE has created ePowertrain, on-board charging system, DriveONE-Cloud, and other solutions for Class-A and Class-B battery EVs and extended range EVs. This is intended to help carmakers build better vehicles and improve driving experiences.

- Range: Equipped with silicon carbide (SiC), our ultra-high-efficiency, high-voltage ePowertrain platform enables ultra-long ranges, and supports dynamic voltage scaling between 750 V and about 900 V. This platform can minimize energy consumption and increase vehicle efficiency to 92% according to the China light-duty vehicle test cycle (CLTC).
- Power: Our high torque output motor and intelligent oil cooling system 2.0 can enable cars to accelerate from 0 to 100 km/h in about 3 seconds. In this way, standard vehicles can achieve sports-car-like acceleration for inspired driving experiences.
- Intelligence: Our iTRACK algorithm enables ePowertrain systems to deliver active intelligence through microsecond-level ultra-fine road perception and millisecond-level real-time torque adjustments.
- Safety: We are actively promoting cloud-based AI, data collaboration, and device-cloud synergy in the e-Mobility domain. This can visualize the health status of e-Mobility systems, issue real-time warnings, and enable quick fault diagnoses.

(Left) The AITO M9 runs on a Huawei DriveONE high-efficiency ePowertrain, which can allow the car to accelerate from 0 to 100 km/h in 4.3 seconds. Our cloud-based battery management system (BMS) and AI analysis also support real-time vehicle safety warnings and comprehensive battery safety.
(Middle) The AVATR 12 comes equipped with Huawei's DriveONE intelligent software algorithm iTRACK that enables active intelligence through microsecond-level ultra-fine road perception and millisecond-level real-time torque adjustments.
(Right) The LUXEED S7 comes equipped with Huawei's DriveONE high-voltage SiC ePowertrain that offers robust power with its high-efficiency SiC modules.

New Energy Infrastructure for the Digital Industry

We have continued to build new energy infrastructure for the digital industry as part of our commitment to delivering more bits with less watts and fewer carbon emissions. This infrastructure includes data center facility and site power facility solutions. We want to reduce the energy consumption and carbon emissions of every bit of data generated, and bring the world more green computing power and connections.

Data Center Facility and Critical Power

Huawei has developed reliable, green, and low-carbon solutions for large data centers, small- and medium-sized data centers, and critical power. These are used to build data center facilities and critical power supplies that are reliable, green, simple, and smart. Our ultimate purpose is to power the digital era forward.

- Large data centers:
  - FusionPower6000 3.0 (for both indoor and outdoor scenarios) is a worry-free power supply and distribution solution that reduces footprints and saves power and time, setting the trend for integrated power supply and distribution systems for data centers.
  - Huawei's indirect evaporative cooling solution (EHU) can be used to build ultra-reliable, high-efficiency, and energy-saving data center cooling systems.
  - Huawei's prefabricated modular data center solutions support fast delivery of simplified, low-carbon, and energy-saving data centers.
- Small- and medium-sized data centers: FusionModule2000 is a one-stop solution for small- and medium-sized data centers, helping industries go digital faster.
- Critical power: Huawei's SmartLi UPS is an intelligent power supply and distribution solution that features high reliability and high efficiency, providing continuous power for critical equipment.

In 2023, Huawei worked with industry associations to publish several industry standards, such as the *Specification for the Design of Indirect Evaporative Cooling System in Data Center* and the *Standard for Design of Lithium-ion Battery Rooms in Data Centers*. These achievements are an important part of our larger efforts to promote quality development of the data center industry.

China Unicom Guangzhou's Internet Data Center (IDC) building, located in China-Singapore Guangzhou Knowledge City, uses Huawei's FusionCol8000-C fan wall air conditioners that support inlet water temperatures of up to 20°C and reduce the overall energy consumption by more than 20%. This project also uses Huawei's UPS5000-H, which features a unique S-ECO mode that can increase power supply efficiency up to 99.1%. In addition, Huawei's iCooling@AI energy efficiency optimization solution has helped reduce the project's power usage effectiveness (PUE) to less than 1.3, cutting electricity consumption by about 13.245 million kWh and carbon emissions by about 7,695 tons each year.

The Felipe Ángeles International Airport (AIFA) in Mexico used Huawei's FusionModule2000 solution to build a smart modular data center that has highly integrated cooling, cabinet, and aisle systems. The project was delivered in only three months, about 30% faster than conventional solutions could deliver, and slashed OPEX by about 30% and PUE by about 25%.

Site Power Facility

Huawei is also working to help carriers and tower companies transition from energy consumers to energy prosumers.

- **For energy consumers, we have developed green and low-carbon networks that minimize total cost of ownership (TCO):**
  - Our trend-setting "one cabinet one site" and "one blade one site" solutions are redefining simplified sites and improving site energy efficiency to about 97%.
  - Our simplified equipment room solution ensures smooth capacity expansion without adding new equipment rooms, increasing energy efficiency to about 75%.
  - Our smart site solution supports intelligent site O&M and visualizes energy efficiency.
- **Energy producers can use Huawei solutions to benefit from energy production and power dispatching.**
  - Our iPV intelligent optimization technology can increase energy yields by about 20%.
  - Our intelligent algorithm for PV and ESS synergy can increase green power utilization rates while reducing the levelized cost of electricity (LCOE) for green site power.
  - Our CloudLi energy storage system supports precise backup power and engages sites in power services like intelligent peak staggering and virtual power plants.

In partnership with the China Mobile Design Institute and China Mobile Zhoushan, Huawei has deployed a green site on Zhuzishan Island in Zhejiang province. The site has an installed PV capacity of 26.4 kWp, with over 90% of its energy used coming from green sources. All surplus power generated is stored in the ESS, which can be used to supply power to the green site. The site also uses a 36 kW high-density eMIMO intelligent power system that is only 5 U in height and supports intelligent scheduling and seamless switching between solar power, stored energy, and fuel. The system can keep the site running for up to 20 days, even under continuous overcast and rainy conditions.

Carbon neutrality is a journey that all industry players are on together. Huawei Digital Power will innovate nonstop in both technologies and products, and working with partners to create value for customers and the industry. Together with our partners, we will build a digital energy industry ecosystem and promote high-quality industry development.

Consumer Business

In 2023, Huawei's Consumer BG continued to deliver a Seamless AI Life experience to consumers around the world by focusing on consumers and constantly optimizing our hardware and software ecosystems across all scenarios. Specifically:

- We launched a Pioneer Program for the Chinese market, which supported the launch of smartphones like the HUAWEI Mate 60 Series and HUAWEI Mate X5, reinforcing Huawei's status as a high-end phone brand and showcasing Huawei's technical strengths.
- We hit multiple shipment milestones, with over 100 million Huawei tablets being shipped by the end of 2023, and over 2.5 million HUAWEI WATCH GT 4 units shipped within three months of its launch.
- By the end of 2023, HarmonyOS had been deployed on more than 800 million devices.
- We launched a new ultra-high-end brand ULTIMATE DESIGN, which pays tribute to the extraordinary – not those who are born, but those who dare to be.
- The Harmony Intelligent Mobility Alliance (HIMA) was established to support vehicle upgrades under our Huawei Zhixuan model and empower carmakers to successfully launch multiple new models.
- In the smart home domain, we continued leading efforts to develop smart spaces.
- In markets outside China, Huawei's mindshare as a high-end brand continued to increase, and our business results improved significantly.

"1 + 8 + N" Seamless AI Life Strategy: Continuous Innovation in Five Scenarios

Huawei has now pursued a smartphone-centered "1 + 8 + N" Seamless AI Life strategy for several years. We have continued to enhance the presence of Huawei devices across all scenarios, aiming to deliver a seamless, intelligent experience for consumers across five major scenarios: Smart Office, Fitness & Health, Smart Home, Easy Travel, and Entertainment.

Huawei launched a Pioneer Program in the Chinese market in 2023. Smartphones like the HUAWEI Mate 60 Series have received accolades from numerous consumers.

Smartphones

Despite a tough external environment, we continued to lead the industry in technological innovation, with Huawei smartphones winning high acclaim from numerous consumers. Our work has drawn extensive attention to the development and innovation of Chinese smartphone manufacturers.

As part of our Pioneer Program, which targets the Chinese market, we launched the HUAWEI Mate 60 Series, HUAWEI Mate X5, and HUAWEI nova 12 Series smartphones.

The HUAWEI Mate 60 Series is the most powerful Mate model ever, and has established itself as a paradigm-shifting product. Standout features of these phones include:

- Concentric designs and the earth color palette that creates breathtaking visuals inspired by magnificent mountains and rivers
- The ability to support satellite calling, making them the first consumer smartphones to make and receive calls even when no terrestrial network is available, thanks to Huawei's breakthroughs in satellite communications
- The groundbreaking super-reliable Xuanwu architecture that offers multiple layers of safeguards for ultimate security and reliability

In the foldable phone market, Huawei's innovative solutions have set industry benchmarks through continuous breakthroughs in design, reliability, and performance. The flagship HUAWEI Mate X5, for example, leads the way in the foldable phone market thanks to its lightweight design and superior all-round experiences. Its exterior screen is made of super durable Kunlun Glass with crystal armor scratch-resistant technology[1], and its interior screen is made of impact-resistant non-Newtonian fluid materials, providing solid and durable protection. It also combines AI algorithms and innovative antenna technology to give consumers more stable network connections even in weak-signal scenarios.

In 2023, HUAWEI XMAGE made great strides in technological innovation, user experience, and cultural development. Multiple flagship smartphones were launched this year with HUAWEI XMAGE onboard, such as the HUAWEI P60 Series which has been a balanced fusion of imaging intelligence and technological art. This series comes with an innovative Ultra Lighting Telephoto Camera with Multiple Lens Groups which produces vivid photos in low-light settings. The *HUAWEI XMAGE Trend Report 2023* was released during MWC Barcelona 2023. Winners of the XMAGE Awards 2023 contest were announced, and 10 standout submissions to the XMAGE Awards were showcased at exhibitions in multiple cities across China. Through these efforts, we aim to ignite a wave of enthusiasm for mobile imaging, inspiring people to express their emotions and build confidence through "the power of image".

To deliver the best possible experience to consumers, we have worked tirelessly to build a high-end brand. After years of hard work, in 2023 we launched our new ultra-high-end brand ULTIMATE DESIGN, which offers ultimate aesthetics, craftsmanship, and innovation. The HUAWEI Mate 60 RS | ULTIMATE DESIGN was the first product launched under this brand with innovative, cutting-edge technologies and superior services. This smartphone is designed to pay tribute to the extraordinary – those who boldly lead our world forward.

"Dragon Clouds" by Domcar Calinawan Lagto (Philippines), a winner at the XMAGE Awards 2023

"Diving" by Li Lu (China), a winner at the XMAGE Awards 2023

[1] Actual configurations may vary. For more details, please refer to the official website.

Smart Office

In the smart office domain, Huawei continues to lead innovation through multi-device collaboration and ecosystem integration, enabling more convenient connectivity, smoother flow of information, and more intuitive human-machine interactions. By fusing aesthetics and technology, Huawei Smart Office products adopt premium and stylish industrial designs and provide portable and versatile solutions that help users stay creative and be more productive in immersive, professional scenarios.

Our flagship laptop, the HUAWEI MateBook X Pro, comes with a skin-soothing metallic body and a Super Turbo intelligent acceleration engine that intelligently schedules the laptop's performance through hardware-system-scenario convergence to help users stay one step ahead at work.

2023 also marked the 10th anniversary of Huawei's tablet line. By the end of 2023, Huawei had shipped a grand total of over 100 million tablets. The HUAWEI MatePad Pro 13.2", our newest flagship tablet, has a 13.2-inch flexible OLED display and is the thinnest tablet ever made with the narrowest bezels and highest screen-to-body ratio[1]. The PaperMatte™ Display used on Huawei tablets provides paper-like viewing, with minimal glare and eye strain. Both the HUAWEI M-Pencil (3rd generation) and HUAWEI Smart Magnetic Keyboard are now powered by NearLink technology, allowing for finer strokes, faster typing, and more stable pairing.

In addition, HarmonyOS 4 on Huawei's Smart Office products comes with upgraded SuperHub and Show Comments functions, which allow data to flow seamlessly between multiple devices, including PCs, tablets, and monitors. This makes the real-time sharing of comments in different meeting scenarios a reality, significantly boosting productivity.

In 2023, we launched the GoPaint Worldwide Creating Activity, a digital creation event themed "Creation of Beauty" where consumers around the world paint using Huawei products, sharing the joy of creation and inspiring creativity.

We also officially launched Qingyun on the Chinese mainland, a device brand designed to cover all scenarios in the business domain. With proprietary full-stack technologies powered by the HarmonyOS digital ecosystem, the Qingyun brand will work with customers to create a fully connected digital future.

Fitness & Health

Since our entry into the fitness and health domain in 2014, Huawei has launched a broad portfolio of consumer products that provide innovative technologies, architecture, materials, processes, and business models. These quality products are targeted for certain demographics, so that everyone gets the support they need, including children, adults, and people with unique health management requirements.

Over the last decade, we have made one breakthrough after another in fitness and health monitoring, disease risk screening, and proactive health management by constantly improving accuracy and user experience regarding vital sign monitoring. By the end of 2023, over 150 million Huawei wearables had been shipped around the world, and we had served more than 450 million users in the fitness and health domain.

In 2023, Huawei unveiled our "Fashion Forward" proposition for our wearables, combining elevated design features with powerful health and fitness functionalities to usher in a new era of stylish wearables:

- Design: The HUAWEI WATCH GT 4's new geometric aesthetics encompasses a striking octagonal design and stunning ring bezel. The HUAWEI WATCH ULTIMATE DESIGN became Huawei's first-ever gold smart watch, featuring 18K gold and zirconium-based liquid metal. Our flagship smart watches, the HUAWEI WATCH 4 Series, sported brand-new futuristic aesthetics paying homage to celestial bodies.
- Health: The HUAWEI WATCH 4 Series offers the Health Glance feature[2], making health management more effortless and accessible. The HUAWEI WATCH GT 4 comes with the improved Activity Rings and the Stay Fit app to help users build healthier lifestyles.
- Fitness: The HUAWEI WATCH Ultimate is the first consumer smart watch to support two-way BeiDou satellite messaging on the Chinese mainland. Combined with 100-meter dive-level water resistance capabilities and an all-new expedition mode, it is a must-have companion for intrepid explorers scaling new heights, plunging to new depths, and exploring the unknown.

1 As of March 2024.

2 This feature is not medical software, and should not be used to treat medical conditions. Results are for reference only, and should not be used for medical diagnosis or treatment.

Huawei appointed two new Wearable Product Ambassadors this year, four-time Olympic gold medalist Sir Mo Farah and fitness & lifestyle influencer Pamela Reif, to inspire consumers worldwide to stay healthy (photo taken on Sheikh Zayed Road, Dubai, the UAE).

We have also continued to increase investment into R&D, with over 800 patent applications filed in the fitness and health domain by the end of 2023. On October 26, 2023, Huawei opened its third Health Lab in Helsinki, Finland. Relying on Huawei's more than a dozen R&D centers around the world, we have built a world-class R&D system and innovation platform for the fitness and health domain. We will further research and develop cutting-edge fitness and health technologies and accelerate the global layout of professional research in the wearables domain to help consumers around the world personalize their lifestyles with better fitness and health products and services.

Smart Home

In the Chinese market, HUAWEI Smart Space solutions continue to lead the smart space industry. We launched the Central Control Panel S2, the industry's first "space traversing" control panel, as well as innovative products such as the Mondrian Smart Switch and Smart MINI Pro. Together with our constantly-expanding subsystems and ecosystems, we aim to make the homes of the future smarter and more beautiful.

In 2023, we had more than 300 authorized smart home retail stores located across 145 cities in China. We also continued to support the development of standards and policies related to digital homes and space, and actively participated in driving the interconnection of smart home products. Furthermore, we partnered with major home decoration companies to provide users with more comprehensive and intelligent decoration services that make people's accommodations remarkably better.

We also launched a number of new smart home products in an effort to delight our consumers, including:

- The HUAWEI Vision V5 Series which comes with a unique air gesture control function. Powered by HarmonyOS, the device can be easily and conveniently operated like a smartphone, essentially making it a super large-screen smartphone for intelligent interaction experiences.
- The HUAWEI Gigahome Router Q6 (base-satellite router), powered by Gigahome technology, which can be flexibly deployed in homes without the need for cabling while delivering strong signals to every room.
- The HUAWEI BE3 Pro, Huawei's first Wi-Fi 7 router, which provides consumers with a super-fast connection experience.

- The HUAWEI MemoSpace home storage device which offers an ultra-large-capacity home album and local audio and video library. Users can simply tap their phone against the device to establish an instant connection and automatically sync designated photos and videos to this home storage device.

- The HUAWEI Smart Door Lock that has an electronic peephole function. Powered by HarmonyOS's strong Distributed Software Bus capabilities, this function allows users to conveniently and securely check real-time images from their doorstep on certain HUAWEI Vision products.

Easy Travel

We established the Harmony Intelligent Mobility Alliance (HIMA) to support vehicle upgrades under our Huawei Zhixuan model. Under this model, the automakers we work with successfully launched premium tech-enabled car models by leveraging Huawei's deep expertise in ICT. Our intelligent cockpit and intelligent driving solutions, as well as the intelligent and secure experiences they deliver, have drawn wide acclaim, and their reputation among users has continued to improve. In 2023, more than 90,000 Huawei Zhixuan vehicles were delivered, consisting of various models including:

- The AITO M9, a panoramic smart flagship SUV, which comes equipped with Huawei's full-stack automotive technologies. This model has been selling extremely well, with more than 30,000 units sold within just one week of its launch, representing a breakthrough in the high-end new energy vehicle domain and making it a new benchmark of high-end intelligent vehicles.

- The revamped AITO M7 which features intelligent technologies, large interiors, and superior safety, making it the perfect choice for families who need midsize and large SUVs. More than 120,000 units were sold within 100 days of its launch.

- The Luxeed S7, the first all-electric sedan featuring large interiors, which is redefining the form factor of intelligent sedans by combining intelligent technologies, driving experience, and style. This model has been well received by younger consumers.

With the HUAWEI HiCar solution, we launched a converged desktop, which provides consumers with a smooth experience that seamlessly integrates the smartphone ecosystem and vehicle cockpits. This solution has been used by more than 50 automobile brands in more than 400 vehicle models. In a report on assessing the interconnection experience between smartphones and vehicles released by the Intelligent Car Connectivity Industry Ecosystem Alliance (ICCE), the HUAWEI HiCar solution ranked top in five experience scenarios and 11 experience indicators. Huawei's digital car key service has been used by more than 20 automobile brands, allowing users to conveniently and securely lock and unlock their cars from their smartphones or smart watches.

HMS for Car provides carmakers with global intelligent in-vehicle solutions that help them tap into the global market. In 2023, HMS for Car was newly adopted by more than 10 automakers, and installed on more than 17 million vehicles. HMS for Car works with Huawei's star products, such as Petal Maps, Celia, and AppGallery, to support the global business expansion of carmakers and create value for the global automotive industry.

Entertainment

Huawei has leveraged its global R&D network to create innovative technologies that deliver premium audio experiences for all consumer scenarios, including in-ear earbuds, open-fit earbuds, open-ear earbuds, and glasses. Some of the products we launched include:

- The HUAWEI FreeBuds Pro 3 adopt innovative ultra-hearing dual drivers to redefine sound fidelity, pushing industry standards to new heights. The earbuds enhance the call experience with Pure Voice 2.0 and noise cancellation with Intelligent ANC 3.0, while also taking advantage of smart connectivity for seamless listening. The combination of these features delivers the ultimate all-rounding earbuds for any modern, connected consumer.

In December 2023, Huawei unveiled its first open-ear earbuds, the HUAWEI FreeClip, alongside many other new products at a launch event in Dubai.

Huawei has pursued a smartphone-centered "1 + 8 + N" Seamless AI Life strategy and continued to enhance the presence of Huawei devices across all scenarios, aiming to deliver a seamless, intelligent experience for consumers across five major scenarios: Smart Office, Fitness & Health, Smart Home, Easy Travel, and Entertainment.

- The HUAWEI FreeBuds 5 feature futuristic aesthetics. They come with seamless curves for optimal fit, combining fashion with an ultimate level of comfort, all while delivering robust bass.
- Huawei's first open-ear earbuds, the HUAWEI FreeClip, feature an innovative C-bridge Design and combine comfort and style to provide an Open-ear Listening experience.
- HUAWEI Eyewear 2 brings consumers a personalized, convenient, smart, and considerate interactive experience across all scenarios.

Continuous Evolution of HarmonyOS and a Thriving HarmonyOS Ecosystem

HarmonyOS 4 was officially launched in 2023, bringing consumers exquisite, personalized, smart, and secure experiences on their devices. HarmonyOS 4 provides new personalized themes for phone screens, including emojis and fun themes. With the help of the HUAWEI Ark Engine, devices powered by HarmonyOS 4 deliver significant performance improvements in six areas: graphics, multimedia, memory, scheduling, storage, and power consumption.

Huawei has continued to delve deep into AI technology, and our smart voice assistant has been enhanced by foundation models to better serve user needs. Powered by Huawei's Pangu models, HarmonyOS features new AI-native designs, and its system-level AI capabilities make our voice assistant more intelligent, capable, and considerate.

HarmonyOS 4 is built on a mature foundation comprised of more than 100 million lines of code and 20,000 APIs, providing consumers with a fully connected experience across all scenarios. We are currently focusing on building a brand-new app ecosystem around HarmonyOS.

At the Huawei Developer Conference 2023 (HDC. Together), Huawei announced the HarmonyOS NEXT Developer Preview, which brings together all of the latest development capabilities to app developers. On September 25, we announced the upcoming launch of the new HarmonyOS NEXT.

By the end of 2023, HarmonyOS had been deployed on more than 800 million devices, and the HarmonyOS ecosystem had welcomed more than 2.2 million developers. In addition, HarmonyOS Connect, the technology brand that supports the HarmonyOS ecosystem, had attracted more than 2,500 partners who released more than 7,000 ecosystem products in the Chinese market. In 2023 alone, over 180 million new devices in the HarmonyOS Connect ecosystem were shipped, covering all aspects of the Seamless AI Life and providing consumers with more convenient access to the digital world.

Huawei has invested heavily in the cultivation of talent for the HarmonyOS ecosystem. In the Chinese market, students from 305 universities had attended HarmonyOS events, and classes on HarmonyOS were taught at 135 universities by the end of 2023. Furthermore, 286 companies had run HarmonyOS ecosystem workshops, more than 380,000 developers

had obtained HarmonyOS certification, and the number of industry-university partnership programs on HarmonyOS exceeded 150. These many achievements provide a sufficient talent pool that will support a thriving HarmonyOS ecosystem.

After three years, the OpenHarmony project has become a success thanks to the outstanding support of the OpenAtom Foundation, the industry, and academia. OpenHarmony has become the fastest-growing open source operating system in the smart device domain and a digital foundation that empowers the development of numerous industries. By the end of 2023, more than 70 organization contributors and 6,700 individual contributors had participated in this project, submitting more than 100 million lines of code. More than 460 hardware and software products have passed OpenHarmony compatibility tests, covering key sectors like finance, transportation, education, energy, industry, aerospace, and healthcare.

Huawei has also curated a rich pool of apps and services to deliver users worldwide an intelligent experience across all scenarios. By the end of 2023, the number of monthly active users of HUAWEI Mobile Services (HMS) exceeded 580 million, and the number of monthly active users of HUAWEI ID, AppGallery, and Quick App surpassed 436 million, 580 million, and 210 million, respectively. In addition, the number of monthly active users of HUAWEI Music, HUAWEI Browser, HUAWEI Wallet, HUAWEI Assistant•TODAY, HUAWEI Mobile Cloud, HUAWEI Video, HUAWEI Books, HUAWEI Themes, AI Search, and HUAWEI Weather all exceeded 100 million. Furthermore, Petal Maps is now available in more than 160 countries and regions outside China, and supports over 70 languages, bringing its monthly active users to over 40 million.

Huawei currently works with content creators to provide consumers with high-quality, immersive, and reliable digital content. For example:

- The HUAWEI Newsfeed Connect works with more than 500 premium content providers around the world to help content creators improve productivity with content creation tools powered by AI foundation models, and provide consumers with a vast library of content.
- In 2023, HUAWEI Video added 40 new audio and video partners. The AiMax Cinema Zone is now available on mobile devices, and the HUAWEI MatePad Air became the first mobile device to support HDR Vivid, allowing consumers to enjoy cinematic masterpieces anytime, anywhere.
- HUAWEI Music offers more than 10 million copyrighted songs at lossless audio quality and more than one million Hi-Res songs, offering an end-to-end HD music experience. In 2023, HD spatial audio services were provided to all HIMA-powered vehicles, and the number of songs available increased by 300% year-on-year.
- HUAWEI Books established partnerships with more than 50 top content providers in 2023, and released more than 100,000 new e-Books, audiobooks, comics, and more through a high-quality smart reading platform.
- The HUAWEI Mobile Cloud offers 350 million users worldwide personal digital asset management services, allowing users to sync their data between multiple devices, back up data, and search their devices.

The 5th Huawei Developer Conference (HDC.Together) opened on August 4, 2023. At the event, Huawei released a collection of leading technologies, including HarmonyOS 4, an upgraded version of the HarmonyOS development suite, and the HarmonyOS Next Developer Preview, to help developers build innovative smart devices and apps more efficiently and further improve the Seamless AI Life experience for consumers.

Building a Brand with a Human Touch Through Retail and Service Stores

We have continued to explore and develop new premium retail and service models that give our brand a human touch and optimize consumers' experience at our retail and service stores. By the end of 2023, we had more than 60,000 retail stores, display zones, and display counters around the world, including over 5,500 HUAWEI Experience Stores and 2,100 Huawei Authorized Service Centers. Our service centers cover 50 countries and regions. In 2023, we organized service-focused events such as Service Day, Service Giving Season, and Battery Replacement to improve consumer satisfaction. Throughout the year, our offline service stores conducted more than 350 million consumer interactions.

We continue to build large HUAWEI Flagship Stores and HUAWEI Smart Life Stores in major cities around the world. These stores provide enhanced immersive experiences to local consumers across all scenarios, especially interactive car and home scenarios. By the end of 2023, Huawei had 15 Flagship Stores and the number of Smart Life Stores with a total floor space of over 500 square meters exceeded 300.

HUAWEI Flagship Stores are committed to continuously enhancing Huawei's brand image in the device domain. They deliver a new intelligent experience to local residents by integrating local culture into stores and building "urban living rooms" that allow consumers to get hands-on experience with our latest products and technologies. In 2023, our flagship stores opened a fitness & health section and a section dedicated to children, and started serving coffee to consumers, adding a more human touch to our consumer interactions. Consumers can also experience the accessibility features of Huawei devices in every flagship store, meaning visually- or hearing-impaired users can easily learn about Huawei devices and digital life stories. Our flagship stores have also organized a variety of events for running and driving enthusiasts and community concerts to boost engagement with consumers. HUAWEI Flagship Stores were frequented by more than eight million consumers in 2023.

Moving forward, the Consumer BG will continue to focus everything it does on consumers and double down on its commitment to pursuing technological innovation and building a brand that is trusted and liked by consumers, all while maintaining a human touch. Working with our partners around the world, we will redouble our efforts to build a thriving HarmonyOS ecosystem and continue delivering a Seamless AI Life experience to our consumers.

In 2023, new HUAWEI Flagship Stores were opened on Binjiang Avenue in Tianjin and Taikoo Li Qiantan in Shanghai. In the future, HUAWEI Flagship Stores will open in more cities to provide more convenient retail and service experiences to more consumers.

Intelligent Automotive Solution Business

In 2023, intelligent electric vehicles (EVs) continued to gain traction in China, with penetration rate exceeding 35%. Intelligence and connectivity have gradually become differentiating factors for vehicle performance. Huawei is determined to become a provider of new components for vehicles. In line with this strategic position, our intelligent automotive solution (IAS) business unit (BU) will continue to focus on providing intelligent automotive components for customers, and leverage Huawei's ICT expertise to improve driving safety and experiences as we work to create both business and social value.

After years of heavy investment, we have developed industry-leading solutions for intelligent driving, intelligent cockpits, and intelligent vehicle control, all of which are ready for large-scale delivery. We will continue to pursue technological innovation and industry leadership and prioritize quality, safety, and security, while enabling customers and working with industry partners to promote intelligent development.

Business Development

Our significant investments in recent years have enabled us to establish unique competitive advantages in intelligent automotive solutions and we are now seeing rapid growth in both sales orders and revenue. We are working with our partners to bring consumers an intelligent mobility experience and drive the intelligent transformation of the automotive industry.

We are continuing to increase our investment into R&D. To date, we have invested more than CNY30 billion into the R&D of our IAS BU, and this BU currently has 7,000 R&D employees.

We are working hard to provide customers and partners with high-quality products, and our IAS business is growing rapidly. By the end of 2023, we had shipped more than three million sets of intelligent automotive components, which included products and solutions like intelligent cockpits, intelligent driving, intelligent vehicle control, intelligent vehicle cloud services, LiDARs, mmWave radars, cameras, gateways, augmented reality head-up displays (AR-HUDs), intelligent headlights, and T-Boxes.

In 2023, Huawei launched and commercialized the HUAWEI Advanced Driving System 2.0 (ADS 2.0), which delivers consumers an intelligent driving experience without the need for high-definition maps. This technology is now available throughout China, and the more consumers use it, the easier driving becomes.

ADS 2.0 also supports functions like mechanical car parking and auto valet parking, and allows cars to park in tight spaces with ease. It is the first system in the industry to provide these functions. ADS 2.0 also features the industry's first comprehensive collision avoidance system (CAS), which offers the quickest automatic emergency braking (AEB) on the market. These functions help make driving safer and easier.

Huawei's HarmonyOS Intelligent Cockpit is one of the best cockpits on the market. In 2023, Huawei's intelligent cockpit system was upgraded to HarmonyOS 4, which supports smoother system operations, stronger voice capabilities, and extraordinary experiences with functions like OneHop file sharing, super desktop, and intelligent vehicle finding.

In 2023, seven car models built as part of strategic cooperation with our IAS BU were launched and highly recognized by consumers. Intelligent driving and intelligent cockpits have become important factors in purchase decisions and have a bright future.

Quality, Safety, and Security

Quality, safety, and security are the lifelines of automotive products. Huawei pursues a zero defect system that puts safety, security, and quality first, and integrates these requirements into all business processes, from R&D and testing, to manufacturing, supply, and procurement.

- Our Quality and Safety Committee is the highest decision-making organization regarding the quality, safety, and security for our IAS business, and ensures the Safety First concept is implemented through leadership and organizational measures.
- We didn't stop at automotive-grade functional safety and cyber security certifications. Instead, in 2023, we continued to enhance our safety and security system, and passed internationally recognized certifications on the safety of the intended functionality (SOTIF).

- We also set up a safety and security evaluation center to independently evaluate product safety and security and ensure that products meet Huawei's safety and security standards.
- We continued to increase R&D investment and developed advanced technologies such as data-driven and model-driven technologies to improve product quality, safety, and security.

Ecosystem Development

As part of Huawei's broader "Platform + Ecosystem" strategy, we are creating a digital foundation and development tools that can be used to build intelligent vehicles. By the end of 2023, we had brought together more than 300 partners from across the automotive industry through the following four ecosystem platforms:

- The intelligent digital vehicle platform (iDVP) ecosystem has attracted more than 100 partners, and our iDVP is already pre-integrated with 40 tested equipment models from 20 vendors.
- The intelligent driving computing platform ecosystem has more than 70 partners who are helping enable intelligent driving pilots and commercial applications for passenger cars, ports, mining trucks, and campuses, among others.
- Through our HarmonyOS Intelligent Cockpit platform, we have collaborated with over 150 hardware and software partners to provide consumers with intelligent, personalized, and diversified service experiences.
- Through the Intelligent Automotive Optics platform, we have established cooperation with more than 10 tier-1 vendors.

Together, these four platforms form a larger ecosystem, expand the total addressable market, and accelerate the intelligent transformation of the automotive industry.

Huawei also actively contributes to industry standards and key technologies that support the development of the automotive industry.

- Huawei has been deeply involved in the SparkLink Alliance, which is committed to driving innovation in next-generation short-distance wireless communications technology. To date, the alliance has brought together more than 240 member organizations across the value chain.
- As a founding member of the Software-Defined Vehicle (SDV) Standards Committee under the Software Subcommittee of the China Association of Automobile Manufacturers, Huawei actively pools wisdom from across the industry to drive consensus and contribute to industry standards. In 2023, the SDV Standards Committee and over 100 member organizations jointly released the social organization standard – *API Specifications for Intelligent Connected Vehicle Services*, in order to promote industry collaboration and address common industry issues. By June 2023, the SDV Standards Committee had published more than 500 atomic service APIs and over 400 device abstraction APIs.

Industry Recognition

In 2023, Huawei's intelligent driving and intelligent cockpit solutions won multiple industry awards, setting new industry benchmarks.

- Our intelligent driving solutions won three awards at the iVISTA Intelligent Connected Vehicle Challenge: Best Perception Award, Best Safety Award, and Special Automatic Emergency Braking Award.
- Our intelligent solutions received the highest rating from the iVISTA China Intelligent Vehicle Index while dominating with intelligent safety and navigation cruise assist.
- Our intelligent driving and intelligent cockpit solutions won three awards from the AutoLab Golden Flame Award: Intelligent SUV of the Year, Best Interconnectivity Experience of the Year, and Best Commuting Experience of the Year.
- Huawei's HarmonyOS Intelligent Cockpit won the Mobility Technology Award.

Research and Innovation

The intelligent world is approaching, faster than ever before. This is creating unprecedented opportunities and challenges in terms of innovation. Huawei continues to invest in basic research and open innovation, and accommodates and addresses customer needs with an open mind, while steering these needs with science and technology. We have also built flexible business models and encourage numerous industries to adopt a vast range of models and applications. Through such initiatives, we are bringing digital to every person, home and organization for a fully connected, intelligent world.

Basic Research

In 2023, we continued to focus on basic research and strengthened efforts to steer customer needs with cutting-edge technologies. We also pursued breakthroughs in innovation that will drive the entire industry and all of society forward.

- When exploring the infinite possibilities of science, we remain dedicated to combining mathematics with modern information and communications technologies. In 2023, we further developed our basic research capabilities and broke through numerous bottlenecks plaguing the industry:
  - In information theory coding, we extended the classical fast Fourier transform (FFT) algorithm to algebraic geometry codes by Goppa, reducing their complexity from O(n^2) to O(nlog n).
  - In machine learning, we developed a new federated conformal prediction method based on quantile regression. This method addresses the label shift between agents and provides theoretical guarantees for both valid coverage of the prediction sets and differential privacy.
  - In large language model training, we developed CAME, a novel memory-efficient optimizer that supports adaptive confidence-based updating and consumes over 50% less memory than the Adam optimizer. The paper we published on this optimizer was named one of ACL's (Association for Computational Linguistics) 2023 Outstanding Papers.
- We also ramped up efforts to apply our latest basic research results to industry. At Huawei, we refer to this as "laying eggs along the way".
  - In wireless communications, we developed an energy-efficient low-order digital predistortion architecture to manage nonlinear power amplifier distortion in wideband massive multiple-input multiple-output (MIMO) systems. This design is based on a decomposition theory and can realize a 3–5 dB improvement in correction performance.
  - In optical communications:
    - We designed a simplified nonlinear fiber compensation algorithm, using the perturbation theory to solve nonlinear Schrodinger equations. This algorithm has helped extend the long-haul transmission distance of 800 gigabit fiber by about 20%.
    - We also designed a metasurface-enabled light modulation model based on the finite-difference time-domain (FDTD) method to address polarization dependence of liquid crystal on silicon (LCoS) – the engine for optical cross-connect (OXC). This model has allowed us to simplify wavelength selective switch (WSS) by anywhere from 50% to 75%.
  - In artificial intelligence, we introduced Integral Neural Networks, a new family of networks featuring continuous layer representation to address the intense computing resource demands of generative model training. These networks support multi-process inference on a single XPU, multiplying inference efficiency without losing accuracy.
  - In information retrieval, we proposed a new method for approximating data distribution through function mapping to handle possible explosions in index space triggered by rapid increases in high-dimensional data. This method can boost retrieval speed by an order of magnitude.

Open Innovation

We have continued pursuing open innovation along multiple paths in multiple waves, targeting multiple scenarios. The company works tirelessly to unleash the full value of its complete portfolio, address real business challenges, and create value for the industry.

Wireless Communications

- We field tested prototypes in 11 scenarios and managed to:
  - Become the first to verify zero-overhead integrated sensing and communication capabilities for 6G networks on the centimeter wave (cmWave).
  - Realize centimeter-level precision of multi-object detection and decimeter-level reconstruction of outdoor environments on cmWave band.
  - Verify polarization multiplexing and beam spatial division multiplexing technologies under ultra-large bandwidth on the terahertz frequency band, reaching a peak speed of over 400 Gbit/s at an outdoor distance of 500 meters.
- We were also the first to achieve 0.5 gigabit satellite communications based on cellular mobile broadband protocols while moving at speeds of 130 km/h, demonstrating the potential of satellite-based cellular mobile network enhancement.

Optical Networks

We continued to increase single-wavelength rate and channel capacity, allowing us to:

- Make breakthroughs in 222 gigabaud ultra-high-speed optoelectronic modulator technology and propose a new key subcarrier algorithm and architecture to address coding modulation and power consumption in large throughput scenarios.
- Break new ground in the design and production of a new type of high density multi-element doped optical fiber.
- Commercially use erbium-doped fiber amplifiers (EDFAs) on ultra-wide gain spectrum: C6T + L6T (12 THz).
- Test and verify the first ever 400 gigabit quadrature phase shift keying (QPSK) system, which was able to deliver a capacity of 32T at a distance of 7,000 kilometers.

Carrier and Enterprise Networks

Our innovation in this domain in 2023 centered on three areas:

- We created a layered heterogeneous topology network architecture and a full-path routing technology system that shorten the interconnection distance between nodes and reduce the use of optical components. Therefore, network costs now account for less than 20% of total costs and network reliability has been improved by an order of magnitude.
- We invented a global routing planning algorithm to increase network throughput to over 90%.
- We created the world's first non-uniform Bruck collective communications algorithm, which delivers 50% better performance than other mainstream algorithms in the industry.

AI Algorithms

Foundation models are driving us ever closer to a truly intelligent world, but they also present a number of new challenges. Our innovations in AI algorithms focus on transforming these challenges into opportunities.

- To date, Ascend clusters have been used to train trillions of high-quality parameters for Pangu foundation models. This has helped us:
  - Realize near-linear scaling of training for 4,000 XPUs and address the technological challenges impeding training and inference acceleration and long sequences;
  - Boost the 7-day retention rate of Celia users on Mate 60 phones by more than 10 percentage points; and
  - Use AI in Huawei Cloud EI and business process & IT services for applications in a dozen industries.

- The company also released simplified network architectures that best support Ascend, such as GhostNet v2 and VanillaNet, boosting efficiency by at least 50% while performing the same task to the same level of precision.

Computing

The demand for extreme-scale computing has become a core engine of AI development, so we innovated to achieve a number of breakthroughs in this area in 2023:

- We implemented a novel supernode architecture to realize unified memory addressing and resource scheduling.
- Our new liquid-cooling architecture pushed engineering to new heights in order to reduce footprint while increasing computing power for higher-density computing systems.
- We provide an open and easy-to-use framework for computing ecosystems and have released CANN 7.0, which enables developers to customize high-performance operators and acceleration libraries that directly schedule and manage computing resources.
- We upgraded the Ascend C programming language to simplify operator implementation logic, reducing operator customization time from weeks to days and accelerating AI model and application development.

Consumer Business

Throughout 2023, Huawei remained focused on deepening our roots in core technologies to provide users with industry-leading experience.

- We pioneered advanced imaging technologies such as the adjustable aperture and Super TeleMacro Camera on our phones. We also made groundbreaking efforts in related areas such as an ultra-high dynamic range in scenes with higher light-to-dark ratios, delicate bokeh effects, and multi-modal deblurring. These incredible XMAGE technologies have brought ultra vision photography experiences to our users.
- We became one of the world's first companies to launch a cloud enhancement function backed by technologies like on-cloud algorithms for foundation models trained with hundreds of millions of parameters, a hybrid network supporting both photo preview and sensing, and high image compression. It helps phones capture and recover details within images and deliver portraits of unparalleled clarity and fineness, pushing photography to new levels of precision and beauty.
- Huawei phones now automatically connect to the most optimal network they can find, providing better communications quality and throughput in weak-signal scenarios and delivering more stable network connections.
- We unveiled our next-gen, double-rotating, and multi-dimensional hinge that is able to deliver a free range of motion thanks to its dual-track driver structure and ultra-strong aluminum. This makes HUAWEI Mate X5 phones both incredibly light and exceptionally durable.
- We continued to work on materials and production methods for our phones, developing a number of new technologies, such as Kunlun Glass, whose upgraded formula and atomic structure enhancement make it 100% more drop resistant and 300% more scratch resistant.
- Our HongMeng Kernel was awarded the industry's first Evaluation Assurance Level 6 Augmented (EAL6+) certificate as part of the Common Criteria for Information Technology Security Evaluation (CC), making Huawei the world's first smart device manufacturer to receive the certification in the commercial OS kernel field.
- The number of devices running on HarmonyOS rose to 800 million in 2023 thanks to the system's adoption across numerous industries.
- Following the revamped AITO M7's launch, over 120,000 vehicles were sold in just 100 days. This achievement can be attributed to Huawei's three major proprietary technologies – General Obstacle Detection (GOD), Road Cognition & Reasoning (RCR), and decision making under uncertainty.

Foundational Software

In 2023, we continued pursuing innovation in foundational technologies in order to create a more solid foundation for the industry and ecosystems, resulting in numerous breakthroughs, including:

- Our proprietary GaussDB is becoming China's first database to support full-stack hardware-software collaboration to enable strong dual-cluster consistency, high elasticity for thousands of nodes, and full encryption.

- openEuler now comes equipped with unique new strengths to better address industrial latency, security, and resource utilization requirements, thanks to advances in deterministic low latency, confidential computing, and hybrid deployment and scheduling.

Software Engineering

Vulnerabilities from open source software are a major source of security threats for the software supply chain. Considering this, Huawei has developed an open source vulnerability knowledge library, and made significant headway into technologies like characteristic abstraction, analysis, and comparison, as well as vulnerability research and judgment. This has helped us detect and identify vulnerabilities originating from open source C, C++, and Java projects in advance.

Systems Engineering

In L3 and higher-level complicated autonomous driving scenarios, ensuring safety of the intended functionality (SOTIF) is a great challenge. To surmount this challenge, we:

- Built a simulation testing capability that covers both hazardous scenarios and fault injection, boosting end-to-end testing efficiency by at least five times.

- Achieved leapfrog development in the out of operational design domain (out-of-ODD) detection technology, with the accuracy of safe lane planning at intersections hitting 92%.

Huawei has one of the world's largest patent portfolios

By the end of 2023, Huawei held a total of **140,000+** active patents.

Huawei's patents are broadly recognized across the industry

Huawei is an industry leader in patents in multiple mainstream standards fields, including cellular network communications, short-distance communications, and audio and video codecs.

By the end of 2023, Huawei had signed over **200** patent licensing and cross-license agreements with many of the industry's largest patent holders.

Every year, Huawei invests over 10% of its sales revenue into R&D

In 2023, our total R&D spending reached **CNY164.7 billion**, representing **23.4%** of our total revenue. Our total R&D investment over the last decade now exceeds **CNY1.11 trillion**.

On December 31, 2023, **114,000** employees (about **55%** of our workforce) worked in R&D.

Improving the Management System

Our global management system supports the company-wide promotion of our corporate culture and the effective management of our business. Ultimately, we aim to:

- Stay customer-centric, build an ecosystem for shared success, and continue creating greater value for customers by meeting their needs and pursuing technological innovation
- Effectively manage risks, and ensure operational compliance and business continuity
- Guarantee the trustworthiness of both processes and results, and provide trustworthy, quality products
- Pursue corporate social responsibility (CSR) initiatives and promote sustainable development

Quality and Customer Satisfaction

Quality lowers cost. At Huawei, we remain true to our core strategy of succeeding through quality. We strive to make quality our core competitive edge. Over the past year, we have further improved our quality culture and leadership. We have also strengthened our ISO 9000-based total quality management system and extended our quality management mechanisms and requirements to every part of our value chain. Together, we are working to deliver higher quality to our customers. As always, we have continued to work hard to make Huawei synonymous with high quality in the ICT industry.

In 2023, we achieved many quality breakthroughs, including the following:

- **We improved quality leadership of management at all levels,** improved the quality awareness and capabilities of all employees, strengthened the management of our quality objectives, and increased our quality-related incentives:
  - We organized quality workshops for top management, and quality conferences, audits, and training for employees, while also awarding those who can serve as quality role models, to encourage all employees to pursue quality.
  - We systematically improved the application of quality engineering methods, such as the Huawei hardware innovation and optimization approach (HINA), theory of inventive problem solving (TRIZ), and failure mode and effects analysis (FMEA), to drive the continuous improvement of our products and services.
  - We doubled down on efforts to improve knowledge management and project retrospection and cultivated quality digitalization capabilities within our quality team.

  These efforts have been and will continue to help the company succeed through quality.
- **We continued to roll out the ISO 9000-based total quality management system:**
  - We have built up significant experience and capabilities in quality management over the past 30+ years, and we are adapting this experience to address the unique characteristics of different business domains.
  - We have embedded quality requirements into every process of our business domains, ensuring all aspects of our operations are covered, including R&D, supply chain, service delivery, sales, and marketing. We have specifically focused on putting in place quality requirements that ensure compliance; trustworthiness; internal controls; cyber security and privacy protection; information security; business continuity; Environment, Occupational Health and Safety (EHS); and Corporate Sustainable Development (CSD).

  The quality products and services we offer following these processes will help us continue winning customer trust and maintain our place as their preferred choice.
- **We extended our quality management mechanisms and requirements to suppliers as well as channel and ecosystem partners:**
  - We invested more into both general and targeted programs that help our suppliers and partners across the entire value chain improve their own quality management capabilities. This close collaboration has helped us all improve both our technologies and quality management capabilities so that we can deliver better quality to our customers together.
  - We worked hard to capture more feedback from customers and partners through diverse channels.
  - The management determined key areas for improvement through deep discussions and analyses of key issues, to improve customer satisfaction and achieve shared success with partners.

Huawei quality experts working with partners across the value chain to deliver better quality

- All aspects of Huawei's management system have been certified by leading industry organizations, including our systems for financial robustness, quality management, risk management, human resource management, service delivery, supply chain management, knowledge management, project management, trustworthiness and software engineering, cyber security and privacy protection, information security, functional safety, EHS, CSR, CSD, and business continuity management (BCM). This has brought us extensive recognition from customers. The company has been evaluated and certified by numerous independent third parties, receiving a number of certifications including:
  - ISO 9001
  - TL 9000
  - IATF 16949
  - ISO 13485
  - ISO 10012
  - ISO 14001
  - ISO 14064-1
  - ISO 45001
  - IECQ QC 080000
  - ISO 50001
  - ISO 22301
  - SA 8000
  - ISO 30415
  - ISO 28000
  - ISO/IEC 20000-1
  - ISO/IEC 27001
  - ISO/IEC 27017
  - ISO/IEC 27034
  - ISO/IEC 27018
  - ISO/IEC 27701
  - ISO/IEC 29151
  - CSA STAR
  - PCI DSS
  - PCI 3DS
  - SOC 1/2/3
  - ISO 27799
  - ISO 26262
  - ISO 21448
  - ISO/SAE 21434
  - ASPICE
  - TISAX
  - NIST CSF

Regulatory Compliance

Huawei works hard to conduct its business with integrity and conform to business ethics standards and all applicable laws and regulations. This key principle is upheld by our highest levels of management. We have worked for years to build a compliance management system that aligns with industry best practices and embed compliance management into every aspect of our business activities and processes. These efforts continue to this day. Huawei emphasizes a culture of integrity and invests heavily to make it a reality. As such, every Huawei employee is required to strictly adhere to its *Business Conduct Guidelines* (BCGs).

- Our Chief Compliance Officer manages the company's operational compliance, and reports to the Board of Directors. Every one of our company's business departments and subsidiaries has also established its own compliance team, taking responsibility for the management of its own operational compliance.

- We identify and assess risk according to applicable laws and regulations and business scenarios. In addition, we have formulated control measures that have been incorporated into our business activities and processes. We also continuously optimize our management system through root cause analysis and targeted corrective action.

- We attach great importance to and continuously enhance the compliance awareness of our managers and employees. Through publicity, training, exams, disciplinary action, and other related actions, we push all our employees to fully understand their own obligations as well as those of the company.

- With an open mind, we proactively engage and work with customers, partners, regulators, and other stakeholders on compliance, to constantly enhance mutual understanding and trust.

Compliance Management by Domain

As always, Huawei is dedicated to improving compliance across multiple domains, including but not limited to trade compliance, financial compliance, anti-bribery compliance, intellectual property (IP) and trade secret protection, and cyber security and privacy protection. These compliance requirements are embedded into our policies, systems, and business processes.

Trade Compliance

Huawei has always endeavored to comply with the applicable laws and regulations of the countries and regions in which it operates. These include the applicable export control and sanction laws and regulations of the UN, China, the US, and the EU.

We are committed to fulfilling our responsibilities and obligations related to export controls. We have invested immense effort over the years to establish a mature and sustainable internal system for trade compliance that aligns with industry standard practices, and worked tirelessly to constantly improve this system.

We have also established an integrated trade compliance management organization within the company. This organization manages trade compliance across both group functions and field offices. In addition, we have established specialist teams in our global offices that monitor changes to local laws and regulations; formulate and refine our trade compliance policies, systems, and processes; drive the implementation of these requirements in applicable business domains and group functions; and manage and oversee trade compliance in each link of our business operations, ranging from procurement, R&D, and sales, to supply and services.

Huawei continuously pushes employees to further their own trade compliance awareness. Employees must sign Huawei's BCGs each year, which include commitments to observing applicable export control laws and regulations. Huawei provides training sessions on trade compliance to managers and employees across the company, with training taking various forms across different sessions. These efforts, combined with targeted training for specific business scenarios, ensure employees fully understand their own responsibilities and obligations, as well as those of the company, regarding export controls. The company also regularly conducts internal evaluation and audits of our own trade compliance system.

Financial Compliance

As always, Huawei is dedicated to complying with applicable financial laws and regulations, and earnestly fulfilling its statutory obligations and social responsibilities. We attach great importance to the management of financial compliance risks, and building on our long-term investment into financial compliance, we have established a financial compliance management and control system that

closely aligns with industry standard practices, and have launched improvement initiatives to ensure this system continuously improves.

Specifically, we manage financial compliance from end to end by considering factors such as regions, transaction objects, fund routes, and the risk appetite of banks. Our management also covers our partners. We have set control points for our processes for procurement, R&D, sales, supply, service, investment, finance, human resources, and more. All of this is managed through IT control tools that are constantly being upgraded and refined.

Beyond systems and tools, we also constantly work to increase employee compliance awareness through internal communications on financial compliance, including publicity, training, exams, and disciplinary action. This ensures that employees not only recognize the company's and their own compliance obligations, but also act in accordance with compliance requirements.

Anti-Bribery Compliance

Huawei has a zero-tolerance policy towards corruption and bribery. We have continued to develop our compliance management system and capabilities at both the group and subsidiary levels. Through this system, we constantly monitor and identify risks, embed new compliance controls into our processes, and drive the optimization of relevant business rules and processes. We have also invested heavily in building an atmosphere and culture of compliance and increasing employee compliance awareness. Internally, we work hard to ensure all employee conduct is above board, while externally, we pay special attention to third-party compliance management. We have established compliance monitoring procedures that review the effectiveness of our risk controls and drive improvement of the company's anti-bribery system and the closed-loop management of compliance issues. The combination of these efforts allows us to effectively control anti-bribery compliance risks across the company.

IP and Trade Secret Protection

Respecting and protecting IP: Huawei is dedicated to its long-term investments into R&D and continuously enriching its IP portfolio. Huawei is one of the world's largest patent holders, and the company believes that respecting and protecting IP is the bedrock of innovation. As a follower, practitioner, and contributor of IP rules, as well as an innovator, Huawei invests heavily into IP protection and respects the IP of others. Huawei has reached cross-license agreements with major ICT companies around the world, and works tirelessly to cultivate an industry environment that protects innovation and IP across countries and regions.

Respecting and protecting the trade secrets of others: Huawei is committed to protecting its own IP and trade secrets, while respecting those of others. We explicitly prohibit our employees from improperly acquiring, disclosing, using, or disposing of the trade secrets of others.

The key measures Huawei has taken to protect the trade secrets of others include:

- Issuing our *Regulations on Respecting and Protecting Third Party Trade Secrets*, which set out clear rules that employees must follow to respect and protect the trade secrets of others during business activities and ensure that employees carry out business activities legally and in accordance with our contracts
- Embedding trade secret protection requirements into business processes such as R&D, sales, procurement, and human resources, conducting regular reviews, and continuously improving management mechanisms by taking away lessons and case studies from day-to-day operations
- Organizing publicity, training, and exams on trade secret protection for all employees, so that they are fully aware of their obligations and responsibilities regarding trade secret protection compliance
- Conducting supervision, including checks and audits, to examine efforts aimed at protecting the trade secrets of others and thus ensure effective implementation of our policies, rules, and processes
- Establishing an accountability system based on official corporate policies such as the *Accountability Protocol for Infringements of Other Parties' Trade Secrets* and the *Accountability Rating Criteria for Information Security Violations* to hold violators accountable for any trade secret violations

Regional Compliance Management

For every country and region outside China where Huawei operates, we have appointed a compliance officer and a country board director responsible for compliance (dual role). They manage and supervise the compliance of subsidiaries through the following key measures to guarantee the operational compliance of our businesses:

- Formulating subsidiary compliance management policies in accordance with applicable local laws and regulations, guided by the tone at the top of our organization; helping organizations internalize external laws and regulations; and arranging for subsidiaries in more than 130 countries and regions to publish their own compliance white papers which serve as a guide for professional compliance management activities

- Fully identifying compliance risks related to sales, service, supply, R&D, and other business activities that may be caused by the ongoing influence of uncertainties from geopolitics and economic prospects, technical sanctions, or trade barriers; assigning compliance management responsibilities to business departments; implementing related regulations and processes; and carrying out checks and assessments to ensure that key control measures are effectively implemented

- Providing compliance training for employees across the company. In 2023, compliance training attendance reached 186,200 for employees outside of China, and 70,800 compliance-related exams were taken. The company also works hard to build a corporate culture that values honesty, integrity, and regulatory compliance. These efforts are aimed at helping employees fully understand the compliance-related obligations and responsibilities they hold, as well as those of the company

Management Transformations

The overall goal of transformation at Huawei is to "grow the harvest and increase soil fertility". Our transformations concentrate on the company's strategic businesses and aim to help us maintain policy consistency. Our digital transformations support our businesses and increase business resilience, ensuring stable day-to-day operations.

- **Huawei aims to build strong rep offices, small regions, a small HQ, and a large platform. As such, we continued with our Contract Reviews and Conclusions at Rep Offices Transformation Program in 2023 which is injecting vitality into rep offices and improving their operating efficiency and capabilities. Key steps taken this year include:**
  - Further streamlining our processes and organizations to make them more responsive to customers
  - Driving further optimizations of regional and HQ organizations from the bottom up, so that regions and HQ can focus on supporting what is required by rep offices and cutting down on what is not required

- **To help the company achieve high-quality development in 2023, our digital transformations were aimed at three areas:**
  - Proactively following up on the irreversible trends of digital, intelligent, and low-carbon transformation, further refining our business management, identifying common data governance requirements shared by our partners in different industries, and exploring approaches to streamlining large-scale, multi-format data management in different ecosystems in a proprietary and controllable way
  - Building up capabilities related to controllable data exchange and trustworthy, controllable, and verifiable data space services, which has helped ensure the controllable exchange of more than 20,000 types of data, satisfying the data sharing and governance needs of both our business units at different granularities (e.g., the group, businesses, and field offices) and our ecosystem partners
    - The reliable, complete, and accurate data supported sustainable development of our global supply chain.
    - We performed sustainable development audits on over 1,600 of our major suppliers who support more than 90% of our total procurement.
    - We also worked to ensure that all of our top 100 and energy-intensive suppliers completed their carbon emission statistics and implemented carbon emission reduction projects.
  - Tackling the challenges arising from the application of AI foundation models in enterprises by establishing professional, scenario-based, and data-focused management approaches and systems that clearly define data boundaries, model boundaries, and model use boundaries. These approaches and systems have helped the company address conflicts between the application of AI foundation models and data protection, fully unlocking the value of data elements and supporting the company's high-quality development

- **In 2023, we continued to resort to digitalization to make our businesses more resilient, avoid business interruptions, and safeguard stable business operations.**
  - Digital transactions: As of the end of 2023, our transaction system had been connected to those of 274 account groups, 180,000 enterprise partners, and 46,000 suppliers. In addition, our cloud-based Mobile World Congress and customer summit initiatives improved transaction quality, making it easier for customers, suppliers, and partners (including ecosystem partners) to do business with Huawei.
  - Digital internal operations: Digitalization of our internal operations has helped the company realize "elite team" operations with a large platform. Digital transformation of our major businesses has shortened order fulfillment times and further automated purchase order and acceptance management, increasing both the quality and efficiency of day-to-day operations. In addition, the company eliminated a number of business continuity risks by replacing restricted software packages. The use of proprietary technology has already helped us prevent supply interruptions and safeguarded fund and asset security.
- **We also further iterated our digital transformations to better serve our customers and partners.**
  - In 2023, Huawei completed the large-scale rollout of MetaERP, an advanced digital platform for enterprise operations and management. With this platform, the company has improved its ability to manage human resources, finances, supply chain, procurement, and other aspects. This allows us to efficiently allocate key resource elements while maintaining steady growth. MetaERP now covers 100% of our business scenarios and 96% of our business by volume. This has substantiated the availability and advancement of our proprietary technologies, architectures, and engineering approaches, supporting both business continuity and sustainable development.
  - In the device business, we continued improving our sales, marketing, and service platform to deliver better end-to-end smart home experiences for consumers on both B2C and B2B sides. This has shortened partner registration and incentive settlement times, improved the management efficiency of our retail stores, and systematically built up service capabilities surrounding our "1 + 8 + N" strategy.
  - In our carrier business, we continued to expand and deepen IT system integration for customer transactions and delivery, making it easier for customers to trade with us. In 2023, we connected our end-to-end transaction and delivery system with 34 new accounts and increased the number of accounts capable of supporting collaborative online transactions and delivery by 129.
  - Our enterprise business launched a dedicated partner site and an official site for the new HUAWEI eKit sub-brand as well as related mobile gadgets, such as the Huawei eKit app, to help our distribution partners go digital and improve customer and partner satisfaction.
  - In Digital Power, we continued to put safety and reliability first. We kept building up and refining our end-to-end quality management system to advance digitalization and we enhanced the digitalization capabilities of our entire value chain by helping partners go digital faster.
  - In Huawei Cloud, we focused on products, customers, ecosystems, and resources that provide leading, all-online, intelligent experiences for customers, partners, and developers across all business domains. Our goal for this business continues to be providing a solid, secure, and high-quality cloud foundation for the intelligent world.
- **In 2023, Huawei continued to roll out its Transformation Program for Software Engineering Capability Enhancement, aiming to improve company-wide software engineering capabilities, create trustworthy, high-quality products, build trustworthiness in our management system, and realize the replication of successful experience.**
  - Competitive and trustworthy products:
    - **Trustworthy results:** In 2023, we fixed 100% of widely exploited vulnerabilities and prevented 100% of high risks identified during product threat analysis. Products within the scope of this Transformation Program have been verified by Huawei's Independent Cyber Security Lab (ICSL). Over

the past year, the ICT business has also obtained 174 new external certifications and avoided all major security incidents.

- **Trustworthy process:** We have realized full integrity protection (preventing tampering, implantation, spoofing, and malicious code) and traceability for our software sources, the development process, and the supply chain process. This includes:
  - > Integrity protection for 100% of sources;
  - > Integrity for 100% of internal R&D operations;
  - > Integrity for 100% of deliverables to outside parties;
  - > Scanning of 100% of potentially malicious open source and third-party software;
  - > 100% binary equivalence for applicable products;
  - > End-to-end tracing for all requirements; and
  - > Backtracking to problematic lines of code for any online issues, with all backtracking data being visible.
- **Clean code:** We have also constructed new architectures and platforms for over 80 products, and refactored all historical Huawei-developed code.

– **End-to-end transformation for live-network risk mitigation:**

- We can now identify affected products and customers within minutes of a high-risk vulnerability being detected, and technical investigations into vulnerabilities at the product level can now be finished within hours and patches can be provided within 30 days. In addition, we help customers promptly respond to such vulnerabilities on live networks, so that they can quickly mitigate any attendant risks on their live networks.
- We have also improved our product certificate O&M, helping customers change their live network certificates whenever needed and mitigating risks stemming from information leaks related to their live-network certificates and certificate expiration.
- We have established a security configuration baseline and embedded it into processes to improve product security configuration capabilities. The professional security configuration services we provide support live network configuration of customers and help them quickly mitigate live network configuration risks.
- We are continuing to align contract and product lifecycles, and ensure that both of these lifecycles meet industry requirements. By fulfilling contract-related responsibilities on time, we help customers mitigate risks created by legacy equipment on their live networks.

– **Trustworthiness built into management systems for sustainable development:**

- Through this program, we have developed 306 built-in capability items and restructured the business capability framework for our Integrated Product Development (IPD) business. To date, we have replicated previous successes in building trustworthiness in multiple processes, including IPD, Lead to Cash, Channel Sales, Manage Client Relationship, Market to Lead, Service Delivery, Issue To Resolution, Supply, and Procurement.
- Critical R&D operations now run on only 68 target systems, improving both R&D operating efficiency and experience.

– **A culture that values both trustworthiness and software:**

- Every one of our software managers and employees must now be certified in software trustworthiness before being appointed to their positions.
- Every new project leader (PL) must have experience as a committer.
- All committers must obtain their respective professional certifications.

- We have rolled out a white-box performance appraisal system across the company, with 84.3% of software employees being satisfied that their work contributions have been fairly assessed.

Thanks to these concrete steps, we have built a culture that values both trustworthiness and software.

- **AI Business Intent and Governance Principles:** AI is driving technological changes that greatly improve efficiency, productivity, quality of life, and societal well-being. At the same time, it presents a fair share of ethical and governance challenges. Our company has done a significant amount of engagement and research to understand these challenges. As for implementation, we have established a company-wide set of rules, which include our AI business intent and six AI governance principles, to instruct related business domains in their research, planning, deployment, and adoption of AI. We have a dedicated task force to ensure that AI technologies are being designed, developed, deployed, and used properly. Their goal is to drive responsible and sustainable innovation in our AI business.

Organizational Vitality

Despite changes to our internal and external environments, the company has stayed true to its corporate culture and core values. We have flexibly pooled resources by business and continued efforts to develop organizations for diverse businesses and field offices. In addition, we have rolled out transformations related to organizations and talent to enrich talent and improve organizational capabilities and efficiency. In the face of uncertainties and ongoing challenges, our employees have stayed confident and our organization has remained dynamic.

In 2023, our initiatives for boosting organizational vitality focused on the following key areas:

- **Adapting our organizational structure to better match our business, increasing organizational agility and efficiency, and steadily advancing transformation:**
  - The company has continued refining and strengthening its organizational structure to better support a multi-business landscape that integrates our ICT infrastructure, consumer, digital power, cloud computing, and intelligent automotive solution businesses.
  - We continued to roll out the Representative Office Full Autonomy Program globally, as scheduled, and piloted integrated transformations at select representative offices. This program gives representative offices greater autonomy, allowing them to independently operate, make decisions, fulfill contracts, and take responsibilities. This strengthens our representative offices and simplifies our HQ teams, and will ultimately help transform our organization into one with multiple elite teams supported by a large platform.
  - We continued to develop new operating models for our integrated teams. By shortening management chains and leveraging the company's strengths as a solution and technology platform, we are able to better serve customers by more quickly meeting their requirements.
  - We systematically organized campaigns in strategic areas of focus. This operating approach has helped us break down organizational boundaries and encourage closer collaboration between different departments through a systems engineering approach. Our global leadership continues to grow thanks to these integrated teams as they help us give full play to our complete business portfolio.
- **Keeping the business strategy in mind as we build up a team of managers who can lead the businesses towards global leadership through the following actions:**
  - We encourage managers to work together towards shared goals and deepen their understanding of the company's strategic intent.
  - We stay true to the manager selection mechanism, focus on their responsibility fulfillment results and contributions, and continue to implement a manager resume system, in order to select the right commanders and managers and allow more bright minds to stand out.

- We have continued to implement the term of office system for managers and encourage them to grow through mobility programs, including vertical and horizontal rotations. This will allow the company to seize new industry opportunities and build a more dynamic management team.

- We continue to strengthen manager specialization by using exams to facilitate learning and combining training with practice. This aims to help managers better prepare for and fulfill their jobs.

- We encourage administrative teams to effectively fulfill their responsibilities and inspire passion across the organization.

- **Assigning employees to positions that best suit them, continuing to actively source outstanding talent from around the world, and unleashing the potential of current employees, to keep enriching talent and maintain the dynamics of teams across the company:**

  - We have continued to bring in talent from around the world, regardless of background or seniority. With top minds and high-end talent joining us, we will be able to lead technological innovation and guide future customer needs.

  - We have adopted talent supply strategies that are tailored to our organizations and are working to create a diverse talent mix.

  - We have strengthened the operations of our talent planning committees and steadily advanced an orderly mobility system for employees and a training and practice system through the Strategic Reserve in order to upskill and reskill employees. These efforts will help our employees unleash their potential.

  - We continued to roll out the Professional Staff Transformation Program in 2023 to create a stable specialist team.

  - We redoubled efforts to systematically strengthen locally-hired teams, providing local talent with well-paced upskilling, enabling them to maximize their value and act as a stronghold for local operations.

  - With a focus on both performance and capabilities, we ramped up efforts to improve competency and qualifications (C&Q) management. We are also reinforcing the operations of profession committees and capability development committees to maximize the value of experts.

- **Continuing the implementation of the Contribute and Share system based on responsibility fulfillment results and developing a differentiated incentive mechanism:**

  - The company is encouraging employees at different levels to better fulfill their operational responsibilities, and the development of an incentive mechanism that varies by business, development stage, and employee group, as a way to help organizations and employees deliver greater value.

  - We are also channeling more resources towards our dedicated employees on the front lines. This is encouraging outstanding employees to make more contributions and motivating employees to take up positions within our business teams that are highly challenging or urgently need to be filled, thus generating even greater value for our customers.

- **Staying customer-centric and inspiring dedication:**

  - Huawei has and always will live by its core values of customer centricity, dedication, perseverance, and growth through reflection.

  - On this basis, we are making every effort to create a dedicated, enterprising, and dynamic organizational climate in line with our diverse business portfolio and talent mix.

  - We care deeply about our employees and will continue to ensure their physical and mental wellbeing by constantly improving their working and living environments and organizing various wellness activities.

Cyber Security and Privacy Protection

Embracing Changes, Challenges, and Opportunities

Over the last year, we have come even closer to the digital world as emerging technologies like AI flourished and data volumes experienced explosive growth. An increasing number of industries are accelerating digital and intelligent transformation, driving new development within the real economy through deeper digital integration. The digital economy is growing rapidly thanks to digital and intelligent technologies.

However, the growing digital economy is also amplifying cyber security risks. The increasing popularity of open source has led to the outbreak of zero-day vulnerabilities, and there have been record numbers of data leaks and rampant ransomware attacks and telecom fraud. Mitigating security risks in cyberspace is increasingly difficult. Therefore, the question has now become: How can we build intrinsic security to support network operators and customers in responding to cyberattacks? How can we build data security and ransomware protection solutions to cope with the challenges standing in the way of digital transformation?

Over the past 30-plus years, Huawei has worked with carriers to build over 1,500 networks and help millions of enterprises go digital. During this time, we have connected over three billion people around the world and maintained a solid track record in security throughout. As digital transformation continues to pick up speed, we are acutely aware that cyber security and privacy protection will become key to business success in the future digital world. With this in mind, Huawei has continued to make cyber security and privacy protection a top priority. We strive to tackle both the challenges and opportunities this new age presents through management transformation, technological innovation, and open collaboration. We are committed to fostering a better life for all in the future digital world by offering secure and trustworthy products, solutions, and services, and by taking concrete steps to manage related risks in our supply chains. We also share our experiences and capabilities with our suppliers and partners so that we can strengthen cyber security and privacy protection capabilities together.

Cyber Security and Privacy Governance: Continuous Improvement to Provide Secure and Trustworthy Products, Solutions, and Services That Help Customers Build Network Resilience and Mitigate Risks

- In 2023, we continued to enhance our end-to-end cyber security and privacy protection assurance system to ensure our efforts in this area were robust and up-to-date.

  Our five-year trustworthiness transformation to improve software engineering capabilities: In late 2018, Huawei's Board of Directors kicked off our trustworthiness transformation with a dedicated five-year budget of more than US$2 billion. The goal of this transformation was to make Huawei the most trusted supplier and partner in the industry with secure, trustworthy, and high-quality products by systematically improving the company's software engineering capabilities. Over the past five years, we have successfully transformed and upgraded our entire Integrated Product Development (IPD) process. For example, in the design phase, we have adopted a security-by-design approach by defining security function requirements, security design patterns, on-shelf trustworthiness technologies, and other security-by-design specifications. In the development phase, we have developed secure coding rules such as the *Huawei Clean Code Guide* and gated check-in rules. In the testing phase, we have built new security testing models such as penetration testing, fault tolerance testing, and resilience testing. We have also incorporated security-related specifications into our R&D tool chains to further standardize our development practices. Furthermore, we have built transformation results and practices into our management systems and processes to protect the integrity of software at the development and supply stages, ensure that transformation achievements can be replicated, and continuously develop high-quality products that are, by default, secure and trustworthy.

  Enhancing privacy governance to respect and protect user privacy: We have continued to improve and refine our privacy compliance framework and adapt and implement it worldwide to meet the compliance requirements of different regions and countries. In addition, Huawei Technologies has been ISO/IEC 27701 Privacy Information Management System Standard certified.

We have continued to invest in privacy compliance IT tools and platforms that enhance the maturity of compliance management in complex scenarios such as cross-border personal data transfers and the personal data compliance management of our suppliers. Thanks to these efforts, we were named an Innovative Data Security and Personal Data Protection Practitioner by the Cyber Security Association of China and presented with the Xingyi Best Practice on Data Security for 2023 award by the China Academy of Information and Communications Technology.

We also share our experience and thoughts regarding privacy governance solutions, platform building, and operational compliance with other industry players to contribute to privacy protection across the entire industry. In 2023, we worked tirelessly to protect the rights of personal data subjects by handling more than 29,000 requests in a timely and effective manner. We also carried out over 60 inspections and audits against industry best practices in multiple countries and business domains. These efforts have helped ensure the effective implementation of our corporate privacy protection policies.

Working with customers and partners to ensure secure and trustworthy delivery and service operations: We have continued to improve the security and trustworthiness of our service solutions and service delivery based on concrete external requirements by improving the reach of our global service center network and helping our customers make their own networks more resilient. We have built systematic IT management capabilities targeting multiple scenarios such as customer authorization, network operations, and cross-border data transfers to ensure that exceptions are successfully intercepted and every operation is system-based and recorded, making our delivery and service operations transparent and traceable. We have built a security and trustworthiness system for delivery and services based on the Enterprise Architecture approach by strengthening internal rules, processes, and digital capabilities. In 2023, we ensured the security and trustworthiness of 955,000 network operations worldwide, including network optimizations, upgrades, and changes.

As part of our commitment to ecosystem development, we shared the knowledge, experience, and tools we developed throughout this process by opening up our knowledge community to partners. Meanwhile, we organized more than 300 Network Safety Day events with customers to strengthen cyber security awareness and capabilities and support secure and stable network operations together.

Strengthening cyber security risk management and capability building within our supply chains: We encouraged 80 logistics service providers and 180 warehouses around the world to perform security self-checks, with 26 key logistics nodes receiving ISO 28000 certification. We continued to identify, assess, and manage risks with relevant suppliers and inspected nearly 1,000 suppliers for cross-border personal data transfer compliance. Through these actions, we helped suppliers standardize their own data retention and management systems and ensured their security and privacy compliance. We also collaborated with relevant suppliers on vulnerability management to mitigate vulnerability risks, and shared our cyber security experiences and capabilities with suppliers, channel partners, and ecosystem partners. We have developed more than 20 courses and, in 2023, provided cyber security training on topics like cyber security baselines and vulnerability management to more than 1,500 managers and engineers from core suppliers. Moreover, we opened up our engineering capabilities, such as cyber security tools and security test cases, to suppliers to help improve their cyber security capabilities.

Improving the expertise of staff working on cyber security and privacy protection and boosting awareness among all employees: We have initiated the development of a cyber security and privacy protection knowledge community that will help connect people, people and knowledge, and knowledge and business. The goal of this community is to facilitate rapid knowledge sharing and transfer and improve individual expertise of staff working on cyber security and privacy protection. In 2023, we also kicked off a cyber security and privacy governance training camp where our employees could grow faster by sharing knowledge and experience in business processes and scenarios through drills, role-playing, and expert lectures.

By the end of 2023, we had created more than 160 cyber security and privacy protection enablement courses, which were attended over 200,000 times. We also run a Cyber Security and Privacy Protection Awareness Month campaign targeting all employees, which features messages from top management, expert lectures, and knowledge quizzes. This year's event attracted extensive employee participation both online and offline.

Continuous investment in independent third-party verification: We continued our cooperation with industry-recognized certification bodies to test the security capabilities of our products against international standards and best practices, providing customers with internationally recognized security assurance. By the end of 2023, we had obtained more than 540 security and privacy certificates. In 2023 alone, we obtained 57 cyber security certificates. Most notably:

- The HongMeng Kernel received Common Criteria Evaluation Assurance Level 6 Augmented (CC EAL6+).
- Huawei Cloud received the new ISO/IEC 27001 certification from the British Standards Institution (BSI).
- Huawei passed the GSMA Network Equipment Security Assurance Scheme (NESAS) audit for 5G base stations, core networks, and network management systems.
- Our in-house HiTLS module received ISO/IEC 19790 certification from BSI.
- Huawei's major smart PV products received both IEC 62443 and ETSI EN 303 645 certifications.

- Huawei leverages the technical capabilities of our 2012 Laboratories to innovate and build security into products and thus help customers cope with the cyber security and privacy challenges and risks they face. Major innovations made in 2023 include:

  Confidential computing, AI security, and data security technologies developed by the 2012 Laboratories: We developed a general, heterogeneous confidential computing platform supporting the full stack of Kunpeng and Ascend to ensure the running environment security of AI models. In addition, we have developed data asset security warehousing solutions to protect AI data and model assets throughout the lifecycle. At Huawei, we believe that the right approach to secure and trustworthy AI is through engineering, standardization, and certification. To improve data security, we have also developed trustworthy dataspace solutions that use a hierarchical policy model and control engine to control data in use.

  Intrinsic security, ransomware protection, and HiSec 3.0 security service solutions for ICT infrastructure: We build security capabilities directly into our mobile communications services to create solutions that feature intrinsic security. By using technologies such as security configuration check, trustlist-based detection, and micro-segmentation, we have bolstered the comprehensive, in-depth defense capabilities of networks by enabling precise threat detection and rapid responses without service disruption. In addition, we have created a ransomware protection solution that helps customers transform reactive security into proactive defense strategies and improve data center resilience. This solution features network-storage collaboration, which means threat intelligence is shared at the network and storage layers so that unknown ransomware attacks can be more effectively detected.

  In cloud security, Huawei has also launched a dozen SaaS-based Qiankun security services. In terms of network security, Huawei has released the HiSec SASE Security Solution which is based on a simplified network architecture that integrates management, control, analysis, and security, redefining enterprise security boundaries. In addition, Huawei has released Qiankun EDR, a lightweight security solution deployed at endpoints that boasts industry-leading ransomware protection capabilities.

  Innovative technologies that safeguard consumer privacy and data: We are continuously upgrading the privacy and security assurance capabilities of our consumer devices. For devices like smartphones, we have followed the five principles of data protection – data minimization, on-device data processing, data transparency and controllability, identity protection, and data security assurance – to develop a variety of new protection functions, including the App Guard, the App Security Center, the Security & Privacy Center, and Image Privacy. This creates an end-to-end privacy and security assurance system that protects consumers while using devices. As mentioned above, Huawei's HongMeng Kernel has also been awarded the industry's first CC EAL6+ certification, the highest security level available in the field of operating system (OS) kernels.

  Cloud-native security and cloud security services: Cloud security is said to be 30% R&D and 70% operations. Guided by this principle, we have built a cloud-native security architecture with a single security operations center and seven lines of defense. This architecture features unique capabilities such as situational security management and incident response automation to address

hundreds of billions of attacks every year. Huawei Cloud also offers the SecMaster security operations platform, over 20 cloud security services, and more than 700 ecosystem-oriented security products to provide customers with secure, stable, and high-quality cloud services and support the development of their own security operation systems and capabilities.

Security for digital power: Based on our insight into the development trends of new power systems, we have worked to enhance the security of PV power stations by bolstering the intrinsic security of products and utilizing technologies like intrusion detection, secure boot, and digital certificate management. The security capabilities of our major PV products have been certified against internationally recognized standards including IEC 62443 and ETSI EN 303 645.

Intelligent automotive components that ensure both security and privacy: We provide cyber security solutions such as Trust Ring to support the critical intelligent automotive components used to build intelligent driving and cockpit products. These solutions come with industry-leading security and privacy capabilities, helping carmakers make better cars. Our intelligent cockpit solution now supports account-dedicated isolation, allowing users to access personal data through zero-touch face authentication. In addition, a driver privacy mode and speech privacy shield have been introduced to protect privacy when multiple passengers are onboard, securing private conversations and business calls.

Shared Responsibility, Joint Capability Building, and Collaboration for Shared Success

Cyber security and privacy protection are common challenges for all as we stride towards a digital and intelligent world. These are challenges that all stakeholders – including governments, industry and standards organizations, and enterprises – have a shared responsibility to tackle. Huawei's cyber security principles are built upon integrity, trustworthiness, capability, accountability, openness, and transparency. Therefore, we welcome closer communication and collaboration with all stakeholders to jointly confront emerging risks and challenges during this world-changing transformation.

In 2023, we collaborated with external stakeholders around the world in many areas:

- We continued to contribute security proposals to standards organizations that will drive the development of security standards in different industries.

  Connectivity: We have contributed more than 300 cyber security proposals to 3GPP and GSMA, maintaining our longstanding position as a leader in the industry. These include 3GPP Security Assurance Specifications (SCAS) for 5G-Advanced Management Function (MnF) and the Next Generation Real Time Communication (NG-RTC) security specifications.

  Computing: We contributed security proposals, including an AI computing platform security framework, general confidential computing framework, and remote attestation procedures (RATS) architecture to ISO/IEC, ETSI, and the National Information Security Standardization Technical Committee of China (TC260), and worked with industry partners to drive the development and application of computing security technologies.

- Our joint innovation with customers continued to evolve.

  We deepened our joint innovation with China Mobile in the cyber security domain, expanding our cooperation beyond 5G security to also cover computing network security. We teamed up with China Mobile Zhejiang to create and test intrinsic security solutions for 5G networks and jointly build a global showcase of the 5G Mobile Cybersecurity Knowledge Base. In addition, we worked with China Mobile Fujian to provide security services such as device access control, dynamic access control, and security situational awareness by opening up 5G network capabilities, thus meeting the security requirements of fully-connected 5G factories. Our joint project won the security track first prize in the Blooming Cup 5G Application Competition. We also worked with China Mobile Guizhou to explore and verify computing network security capabilities, such as a ransomware protection solution featuring network-storage collaboration, confidential computing, and data free flow with trust (DFFT), to meet the security and trustworthiness requirements of data sharing, exchange, free flow with trust, and trading scenarios in the context of

the "Eastern Data, Western Storage" and "Eastern Data, Western Computing" initiatives. The project won second prize at the Huacai Cup Computing Power Innovation Application Competition.

In 2023, Huawei and PLN – Indonesia's national electric power company – entered a strategic partnership agreement and launched a joint innovation lab. This partnership aims to explore digital network operations and cyber security applications and conduct joint innovations in technologies such as in-depth application detection, digital map, network slicing, and situational awareness. Huawei is helping PLN devise a top-down plan for network architecture that will meet business development requirements over the next five years, build enterprise network construction standards and evolution solutions, and incubate innovative solutions for digital network operations. We are also working together on cyber security in core electric power production processes, including the meter data management system, to ensure digital operations security for customer networks and core applications.

Huawei and China CITIC Bank set up a Financial Digital Joint Innovation Lab to explore DFFT applications in the finance industry and develop secure data flow technologies. Based on key technologies such as data security modeling, core access control algorithms, and quantum key distribution, we have been able to deliver security features such as high-performance data use control engines, transparent data encryption and decryption, hardware-based trusted execution environments, and certificate storage and source tracing. We have also incubated new storage appliances and provided a shared space across hardware and software for DFFT and data use. Together, Huawei and China CITIC Bank released the *Technical White Paper on Financial Data Free Flow with Trust* which highlighted innovative practices in infrastructure construction to support the adoption of DFFT in the finance industry.

- We actively worked with government organizations around the world to support local talent cultivation by sharing knowledge and experience.

  In Thailand, Huawei actively participated in cyber security contests, organized cyber security training and enablement sessions, and won the Prime Minister Awards – Thailand Cybersecurity Excellence Award – for the second consecutive year.

  In Malaysia, Huawei worked closely with the local government and carriers on talent cultivation and cyber security awareness and ecosystem building. In recognition of these contributions, Huawei received the Cyber Security Education Innovation of the Year 2023 award in Malaysia.

  In Brazil, we worked with the local government on knowledge sharing and talent cultivation, driving the refinement and implementation of the Digital Brazil framework.

In Egypt, Huawei rolled out various programs for ICT talent ecosystem development, best practice sharing, and awareness enhancement to improve local cyber security readiness. At the 2023 Egypt Edition of the Cybersecurity Innovation Series, Egypt's National Telecom Regulatory Authority presented Huawei with the Cyber Awareness Plan of Year 2023 award.

In Indonesia, we renewed the memorandum of understanding (MoU) on cyber security cooperation with the National Cyber and Crypto Agency (BSSN). We will strengthen cooperation with key stakeholders such as local governments, universities, and enterprises in talent cultivation and capability improvement to jointly address cyber security challenges.

- We intensified cooperation with local universities and industry organizations to help improve cyber security capabilities and awareness in individual regions.

  In the Middle East, as a commercial member of the Organisation of the Islamic Cooperation-Computer Emergency Response Team (OIC-CERT), we participated in the development of the OIC-CERT 5G Security Framework which contributes to the development of local cyber security certification guidelines, standards, and ecosystems. We also cooperated with the International Telecommunication Union Arab Regional Cybersecurity Centre (ITU-ARCC) to develop the Arab Cybersecurity Industry Development Strategy Maturity Module which helps local enterprises identify cyber security threats and enhance their response capabilities.

  In Spain, we signed an MoU with the University of León to jointly build a 5G security lab and experience center. This partnership aims to provide a real-world environment for experimentation and training, and facilitate local cyber security research and talent cultivation.

  In Africa, we inked MoUs or worked with the Communications Regulators' Association of Southern Africa, the East African Communications Organization, and the African Internet Governance Forum on cultivating local talent through 5G cyber security training and other projects. Huawei was also honored with the prestigious Advancing Internet Governance in Africa Contribution Award at the African Internet Governance Forum 2023.

Huawei manages supply chain security risks from three aspects – supplier management, open source software management, and R&D and production management. We encourage close collaboration between upstream and downstream players throughout the industry so that we can jointly build a favorable cyber security environment conducive to development. A stronger industry in turn strengthens security. This is how we can drive the sustainable development of the digital economy. We look forward to closer communication and collaboration with all stakeholders in terms of security standards, technological innovation, security governance, testing, and verification. Together, let's build cyber security and privacy protection capabilities, share value, and foster a better life for all in the future digital and intelligent world.

Openness. Collaboration. Shared Success.

We are facing an increasingly complex environment, with new opportunities and segments emerging left and right:

- **Communications:** We will begin to see large-scale adoption of 5.5G and new short-range communications technologies as the industry's vision for next-generation communications network standards gradually takes shape.
- **Computing:** The Kunpeng and Ascend ecosystems are progressing day by day, and research into new computing architectures is expanding.
- **Audio and video:** Technologies like ultra-high-definition (UHD) audio and video, 3D audio, and graphics engines are thriving.
- **Smart devices:** Seamless AI Life experience and HarmonyOS Connect will see broad adoption across many aspects of work and life.
- **Security:** Countries and regions around the world are actively exploring ways to enhance network and data infrastructure security, learning from each other's experience, and looking for technical mechanisms to make security more controllable and manageable.
- **Industrial transformation:** Industries are expanding the scope of digitalization, embarking on a new journey that combines digital, intelligent, and green transformation.

Over the next 10 to 20 years, communications and computing will become the two most important building blocks of a fully connected, intelligent world. Huawei will continue to openly collaborate with industry organizations and ecosystem partners across various domains, including the public and private sectors, academia, research institutes, and users. We will continue to make standards contributions, and share the industry insights and technical challenges we have identified, in order to drive industry development and technology advancement. We will also use a systems engineering approach to create greater synergy between software, hardware, chips, networks, cloud, edge, and devices, and promote integrated innovation together. This will help make our products and solutions more competitive. As always, we will continue to work with industry partners to cultivate thriving industry ecosystems and create an open and collaborative industry environment that thrives on shared success.

Key Progress and Industry Contributions

Huawei actively works with global industry organizations, and we hold more than 450 key positions in nearly 800 academic associations, standards organizations, industry alliances, and open source communities. We foster deeper partnerships and mutual recognition of standards between industry organizations, and work hard to address industry challenges, breakpoints, and bottlenecks.

- **Standardization:** We firmly support the unification of global standards and actively promote global consensus on connectivity through organizations like ITU, 3GPP, and GSMA. We are helping our partners ensure a smooth evolution towards 5.5G, F5.5G, and Net5.5G. In 2023 alone, we submitted nearly 12,000 contributions to standards organizations worldwide.

- **Industry development:**

  - In the industrial software field, we joined forces with partners to release the *Industrial Digital and Intelligent Transformation White Paper 2030.*

  - In the audio and video field, we promoted the release of HDR Vivid and Audio Vivid standards for devices, chips, vehicles, and many other domains.

  - In the public sector, we proactively responded to input requests from different countries on industrial policy, such as China's five-year action plan for the national AI development strategy.

  - In response to the Green Economy Initiative of the United Nations Environment Programme, we contributed to green standards, further improved the competitiveness of our green ICT and digital power products, and are working to embed new innovation into green industry practices.

- **Ecosystem development:** We have fully defined our philosophy, approaches, guidelines, and processes for developing ecosystems in domains such as HarmonyOS, Kunpeng, Ascend, and cloud computing. We are working hard to cultivate thriving developer and university talent ecosystems, create more fertile ground for open source, and support the success of core open source projects. These are part of our broader efforts to offer the world another standards option.

Group photos – 13th GIO Roundtable, MWC Barcelona 2024

Since 2018, Huawei has worked closely with leading industry organizations via the Global Industry Organizations (GIO) Roundtable to discuss the reference architecture, roadmap, pace, and best practices for digital transformation in various industries, and explore how we can better promote cross-domain and cross-technology information sharing and collaboration in various forms between industry organizations. Our ultimate purpose is to accelerate digital transformation across all industries. The roundtable pictured above focused on data elements, the outlook and path for unlocking their value, and their high-value application scenarios (e.g., manufacturing, healthcare, and transportation), as well as data exchange, data definition, and digital platform ecosystems.

Academic Associations

Huawei embraces an open and diverse academic culture. We actively engage with global academic associations as part of our efforts to explore challenges that industries face and cultivate STEM talent. Together, we are invigorating academic pursuits while driving economic progress.

- **Probing the endless frontiers of science through sharing, exchange, and industry-academia collaboration:**
  - In 2023, we shared our thoughts on the future of wireless, optical, and foundational software at international academic conferences, and we are working with researchers worldwide to draft a tech blueprint for the intelligent world.
  - We worked more closely with organizations such as the China Computer Federation to release more than 70 new research topics in a bid to drive progress in computer science.
  - We continue to support MindSpore-based academic research and have supported the publication of more than 900 papers at leading conferences to drive advancements in AI.
- **Contributing new ideas to academic associations:** We have published more than 1,270 papers in high-impact conferences and journals like the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronics Engineers (IEEE). Among these papers, *Accurate medium-range global weather forecasting with 3D neural networks* was published in *Nature* and named one of the top 10 scientific advances in 2023 by *Science*.
- **Cultivating STEM talent through top competitions:** To inspire and engage the next generation of STEM talent, we contribute real-world industry challenges to multiple competitions hosted by academic organizations, such as the International Collegiate Programming Contest (ICPC), Computer Vision Foundation (CVF), and Society for Information Display (SID).

Standards Organizations

We actively contribute to standards organizations, work with customers and partners to drive technological upgrade in fields such as connectivity, media, devices, and computing, and are working to help all industries go digital, intelligent, and green.

- **We are promoting efforts to open up, co-develop, and share global standards, helping outline a new vision for the industry.**
  - Within 3GPP, we are actively contributing to 5G-Advanced Release 19 through efforts like informing specifications with new-value use cases based on technical innovation, in order to drive the industry forward.
  - Through the European Telecommunications Standards Institute (ETSI), we are supporting efforts to release F5G Advanced standards for the fixed network domain, guide the evolution from F5G to F5.5G, bring 10 gigabit experience everywhere, and drive industry progress.
  - Within IEEE, as part of our broader efforts to enable industry upgrade, we are working together to drive the evolution of network standards for 400G/800G and time-sensitive networking (TSN) in order to support the evolution of carrier, enterprise, industrial, electric power, and vehicle-mounted networks.
  - Within the ITU, we are exploring how to more effectively utilize global spectrum for international mobile telecommunications (IMT), and are helping upgrade optical industry standards.
  - Within ISO/IEC Joint Technical Committee (JTC) 1, we are contributing to standardization on AI-based image coding and decoding and trusted multimedia source tracing, in order to facilitate industry innovation.
  - Within the World Wide Web Consortium (W3C), we are helping promote the release of MiniApp specifications that make it easier for developers to develop HarmonyOS apps.
  - We promoted the release of audio and video standards such as HDR Vivid and Audio Vivid to build a new UHD industry ecosystem.
  - We worked with partners to promote the large-scale application of computing performance benchmarks and the development of full-stack computing ecosystems.
  - Our Pangu models received the industry's first "Excellent" rating in China, in recognition of their contribution to a thriving industry.
- **We are working to drive consensus on standards and help shape new ecosystems.**
  - We are contributing to unified global standards for AI management systems, working with others to build unified AI interface specifications and computing power benchmark specifications, and supporting the development of full-stack AI ecosystems.

- Together with partners, we are developing standards for new electric power, PV power and energy storage system safety, mobility electrification, and green and low-carbon systems to bring safer renewable electric power to all industries.
- We are helping promote industry standards for 5G, big data, AI, and foundation models to fuel industry digitalization.

Industry Alliances

Huawei is a committed partner in major industry alliances around the world. Together, we are working to promote sustainable industry development and help vertical industries go digital.

- **Promoting industry competitiveness and sustainable development:** We are working closely with industry organizations such as GCC, UWA, WAA, GIIC, SparkLink Alliance, and WBBA, as well as partners all along the value chain, to promote industry-wide consensus, standards development, testing and certification, and talent cultivation. These efforts will promote sustainable development in industries such as diversified computing, audio and video, WLAN, IoT, short-range communications, and fixed networks.
- **Strengthening international industry collaboration to advance digital transformation:** Huawei is an active partner in international industry organizations such as GSMA, CSIA, CCIA, CESA, GSA, AII, 5GAIA, 5GDNA, and 5GAA. We actively contribute industry white papers, testbeds, and standards to support the development and application of new digital technologies in sectors such as communications, electronics, manufacturing, electric power, iron and steel, coal mining, oil and gas, and ports. Together, we are driving digital transformation forward.

Open Source Communities

Huawei is a firm supporter and major contributor to open source communities, where we advocate for inclusion, fairness, openness, solidarity, and sustainability. Through our work with developers and partners to build world-class open source communities, we aim to accelerate software innovation and create thriving industry ecosystems.

- **Huawei actively participates in major open source organizations and projects.** We strongly advocate for open source software development. Huawei is a premium or founding member of more than 20 international open source foundations, including the Apache Software Foundation, the Linux Foundation, the Eclipse Foundation, the OpenAtom Foundation, the OpenInfra Foundation, the Cloud Native Computing Foundation (CNCF), and the PyTorch Foundation. We actively contribute to more than 200 open source communities. In particular, we serve in board member positions of dozens of open source communities and serve in hundreds of core roles, including Technical Steering Committee member, Project Management Committee member, Project Team Lead, Maintainer, and Core Committer.
- **With a focus on foundational software, Huawei has launched more than 10 influential open source projects to build a stronger foundation for digital infrastructure ecosystems.** Huawei has launched multiple platform-level open source projects, such as KubeEdge, MindSpore, Volcano, openEuler, openGauss, OpenHarmony, Karmada, openGemini, and Kuasar. These foundational software projects have attracted an incredible number of contributors, including software vendors, developers, research institutes, and universities from all over the world. We have donated openEuler and OpenHarmony to the OpenAtom Foundation, and donated KubeEdge, Volcano, Karmada, and Kuasar to CNCF. These projects have united the contributions of global participants through a more open approach, and are further promoting the digital transformation of industries.
- **We are building a foundational software ecosystem with industry partners.** Under the guidance of the OpenAtom Foundation, the OpenHarmony community has attracted more than 6,700 individual contributors and over 70 organization contributors that have submitted more than 100 million lines of code. The openEuler community has rallied more than 1,300 organization members (e.g., top enterprises, research institutes, and universities), and over 16,800 individual open source contributors. openEuler itself has seen over two million downloads across more than 130 countries and regions. Partners have released more than 20 commercial distributions of openEuler, with over 6.1 million commercial deployments in total.

- **We are helping to build sustainable and trusted open source communities.** Huawei actively works with partners from the software security industry to improve the security of open source ecosystems and address increasingly complex security challenges. We are deeply engaged in the development and promotion of major global software supply chain security standards and specifications, such as OpenChain and SPDX. We continue to fulfill our corporate social responsibilities to help build globally trusted open source ecosystems.

Ecosystems

We openly collaborate with ecosystem partners and developers to create value and help others succeed. We are speeding up efforts to open up our platform capabilities to ecosystem partners and developers in areas like HarmonyOS, Kunpeng, Ascend, and cloud computing. Together, we will continue to improve development experience, enable innovation, and create value.

- **Increasing ecosystem investment to help partners create value.** We are enabling ecosystem partners on all fronts, working together to drive shared success, and creating greater value for our customers. We have increased our support for ecosystem partners and invested tens of billions of yuan to stimulate application innovation based on Huawei's open capabilities. We are offering promotional support and sharing opportunities with ecosystem partners to help them achieve business success. By the end of 2023, we had worked with more than 46,000 ecosystem partners and developed more than 36,600 innovative applications together, accelerating innovation in industries like finance, energy, transportation, manufacturing, healthcare, and education.
- **Enabling developers to innovate and grow by sharing experience, opening up capabilities, and enriching development tools.** To help improve development efficiency, we provide comprehensive toolsets to support different scenarios, including hardware, application, AI, data, and digital content development. We are also working to cultivate and enable developers through various activities and competitions. In 2023, we held 7 flagship contests, over 30 themed summits, and over 1,000 online activities, reaching millions of developers worldwide. We also supported developer growth and innovation through programs like the Shining-Star Program, the OpenMind Program, and the Innovation Support Program. By the end of 2023, we had opened up more than 100,000 APIs and served over 9.5 million developers.
- **Helping universities cultivate talent for digital, green, and intelligent transformation.** Huawei has launched a variety of programs, including the 100 Seed Schools Program, the OpenHarmony Stars program, our updated business-academia talent development program, and the talent development acceleration program. We have released a total of 67 textbooks. Through our Intelligent Base 2.0 program, we have expanded the scope of our technical cooperation with universities. In 2023, Huawei held 77 training sessions in the information field, and engaged in competitions such as the China International College Students' Innovation Competition, the Huawei ICT Competition, and other innovation-oriented events, benefiting more than 4,600 teachers and over 500,000 students. These are part of our efforts to cultivate next-generation talent for the industry.

Industrial Policies

We are working to help unleash the business and social value of the ICT industry by sharing digital economy best practices and promoting digital inclusion.

- **Sharing digital economy best practices to promote digital inclusion.** Huawei and IDC worked together to propose the concept of "Digital First Economy", encouraging policymakers to introduce more favorable policies that support digital infrastructure, digital economy ecosystems, and digital talent development. We have also shared best practices from different countries and regions in advancing their digital economies. These are part of our broader efforts to create greater social and business value and promote sustainable development through digital inclusion. At the World Economic Forum, ITU, and other international organizations and open forums, we regularly share our experience and best practices in promoting digital transformation, digital inclusion, and more.
- **Advising on industrial policy to advance digital transformation.** To promote inclusive and sustainable digital transformation around the world, we actively participate in public consultations on digital economy planning and industrial policy, sharing recommendations on digital development in the countries and regions where we operate.

Results of Operations

Financial Performance

(CNY Million)	2023	2022	YoY
Revenue	**704,174**	642,338	9.6%
Gross profit	**325,364**	281,925	15.4%
– Gross profit margin	**46.2%**	43.9%	2.3%
Total operating expenses	**(283,644)**	(271,279)	4.6%
– as % of revenue	**40.3%**	42.2%	(1.9)%
Other income, net	**62,681**	31,570	98.5%
Operating profit	**104,401**	42,216	147.3%
– as % of revenue	**14.8%**	6.6%	8.2%
Net finance expenses	**(6,659)**	1,018	(754.1)%
Income tax	**(10,646)**	(8,384)	27.0%
Net profit	**86,950**	35,562	144.5%

Huawei's total revenue in 2023 was CNY704,174 million, which was a 9.6% YoY increase. Our net profit was CNY86,950 million.

- Due to industries' digital, intelligent, and low-carbon transformation and our more competitive products, our revenue continued to grow.
- The increase in our profit was mainly attributed to revenue growth, our improved product portfolio, higher-quality operations, and gains from the sales of some businesses.

Total operating expenses

(CNY Million)	2023	2022	YoY
Research and development expenses	**164,721**	161,494	2.0%
– as % of revenue	**23.4%**	25.1%	(1.7)%
Selling and administrative expenses	**118,923**	109,785	8.3%
– as % of revenue	**16.9%**	17.1%	(0.2)%
Total operating expenses	**283,644**	271,279	4.6%
– as % of revenue	**40.3%**	42.2%	(1.9)%

We continued to invest in future-oriented basic research and open innovation in domains such as cloud and computing, intelligent automotive components, and foundational technologies. However, since our revenue grew, our R&D expenses as a percentage of revenue declined YoY.

We also continued to invest in the development of new business domains, ecosystem building, and digital transformation, and our operating efficiency increased thanks to ongoing transformation. As a result, our selling and administrative expenses as a percentage of revenue decreased YoY.

Net finance expenses

(CNY Million)	2023	2022	YoY
Net foreign exchange losses	**474**	277	71.1%
Other net finance losses	**6,185**	(1,295)	(577.6)%
Total net finance expenses	**6,659**	(1,018)	(754.1)%

Huawei's net finance expenses in 2023 totaled CNY6,659 million. This change was mainly attributed to the increase in other net finance losses.

Financial Position

(CNY Million)	December 31, 2023	December 31, 2022	YoY
Non-current assets	**390,503**	289,008	35.1%
Current assets	**873,094**	774,796	12.7%
Total assets	**1,263,597**	1,063,804	18.8%
Among which: Cash and short-term investments	**475,317**	373,452	27.3%
Trade receivables	**97,224**	87,177	11.5%
Contract assets	**53,886**	52,527	2.6%
Inventories and other contract costs	**154,558**	163,282	(5.3)%
Non-current liabilities	**304,597**	196,870	54.7%
Among which: Long-term borrowings	**291,688**	183,183	59.2%
Current liabilities	**451,432**	429,858	5.0%
Among which: Short-term borrowings	**16,726**	13,961	19.8%
Trade payables	**86,362**	85,272	1.3%
Contract liabilities	**95,101**	87,575	8.6%
Equity	**507,568**	437,076	16.1%
Total liabilities and equity	**1,263,597**	1,063,804	18.8%

As of December 31, 2023, Huawei's balance of total assets had reached CNY1,263,597 million, which was an increase of 18.8% YoY. Our current assets accounted for 69.1% of our total assets.

As of December 31, 2023, our total short-term and long-term borrowings increased by CNY111,270 million YoY. The primary purpose of these borrowings was to continue to invest in future-oriented basic research and open innovation.

Cash Flow from Operating Activities

(CNY Million)	2023	2022	YoY
Net profit	**86,950**	35,562	144.5%
Adjustment for depreciation, amortization, impairment, net foreign exchange losses and non-operating income and expenses	**(9,012)**	8,353	(207.9)%
Cash flow before changes in operating assets and liabilities	**77,938**	43,915	77.5%
Changes in operating assets and liabilities	**(8,131)**	(26,118)	(68.9)%
Cash flow from operating activities	**69,807**	17,797	292.2%

In 2023, our cash flow from operating activities was CNY69,807 million, which was a YoY increase of 292.2%. This increase was attributed to growth in our profit and operating efficiency.

Financial Risk Management

In 2023, we closely monitored the changes in our external environment and proactively assessed their impact on Huawei using the financial risk management system we have built over the past years. In addition, we continued to amend and improve our financial risk management policies and processes to further enhance our ability to withstand financial risks and better support our business development.

Liquidity Risk

We have continuously worked to improve our capital structure and short-term liquidity planning, budgeting, and forecasting systems to better assess mid- to long-term liquidity needs and short-term funding shortfalls. We have implemented prudent financial measures to meet our liquidity needs and guarantee our company's business development, including maintaining a robust capital structure and financial flexibility, keeping a proper level of funds, gaining access to adequate and committed credit facilities, creating effective cash plans, and centralizing cash management. As of December 31, 2023, our cash and short-term investments amounted to CNY475,317 million, which shows that we properly managed our liquidity risks.

(CNY Million)	2023	2022	YoY
Cash flow from operating activities	**69,807**	17,797	292.2%
Cash and short-term investments	**475,317**	373,452	27.3%
Short-term and long-term borrowings	**308,414**	197,144	56.4%

Foreign Exchange Risk

Our presentation currency is CNY, but we have foreign currency exposures related to buying, selling, and financing in currencies other than CNY. According to our established foreign exchange risk management policy, material foreign exchange exposures are hedged based on a comprehensive analysis of market liquidity and hedging costs. We have developed a complete set of foreign exchange management policies, processes, and instructions. These include:

- Natural hedging: We structure our operations to match currencies between procurement and sales transactions, to the greatest extent possible.
- Financial hedging: For certain currencies where natural hedging does not fully offset the foreign currency position, we hedge through forward foreign exchange transactions. In countries where local currencies depreciate sharply or that have strict foreign exchange controls, we manage foreign exchange exposures using different measures, including exchange rate protection and financial hedging. We have also adopted solutions like accelerating customer payment and promptly transferring cash out of these countries to minimize risks.

With other conditions remaining unchanged, exchange rate fluctuations would impact our net profit as follows:

(CNY Million)	2023	2022
USD depreciates by 5%	**347**	1,013
EUR depreciates by 5%	**(28)**	(106)

Interest Rate Risk

Interest rate risks mainly arise from Huawei's long-term borrowings. By analyzing interest rate exposures, the company uses a combination of fixed-rate and floating-rate financing tools to mitigate these interest rate risks.

1. Major interest-bearing long-term financial instruments held by the company as at December 31, 2023

	2023		2022	
	Effective Interest Rate(%)	**(CNY Million)**	Effective Interest Rate(%)	(CNY Million)
Fixed-rate long-term financial instruments: Long-term borrowings	**3.64**	**61,676**	3.74	53,219
Floating-rate long-term financial instruments: Long-term borrowings	**3.69**	**230,013**	3.86	129,964
Total		**291,688**		183,183

2. Sensitivity analysis

Assuming that the interest rate increased by 50 basis points on December 31, 2023 and other variables remained unchanged, the company's net profit and equity would decrease by CNY956 million (in 2022, the amount decreased by CNY533 million).

Credit Risk

The company has established and implemented globally consistent credit management policies, processes, IT systems, and quantitative credit risk assessment tools. It has established dedicated credit management teams across all regions and business units, and set up centers of expertise specializing in credit management in Europe and Asia Pacific. The company uses quantitative risk assessment models to determine customer credit ratings and credit limits and quantify transaction risks. It has also set risk control points for key activities across the end-to-end sales process to manage credit risks in a closed loop. Huawei's Credit Management Department regularly assesses global credit risk exposures and develops IT tools to help field offices monitor risk status, estimate potential losses, and determine bad debt provisions as appropriate. To minimize risk, a special process is followed if a customer defaults on a payment or poses an unacceptably high credit risk.

Sales Financing

With its global coverage, Huawei's sales financing team maintains close contact with customers to understand their financing needs and taps into a wide range of financing resources around the world. As a bridge for communication and cooperation between financial institutions and customers, the sales financing team provides customers with specialized financing solutions that contribute to ongoing customer success. Huawei remains committed to working with our financing partners to build a mutually beneficial financing ecosystem. Therefore, we engage our partner financial institutions to provide sales financing facilities in export credit, leasing, factoring and other products with financial institutions undertaking risks and realizing the returns. Huawei has established systematic financing policies and project approval processes to strictly control financing risk exposures. Huawei only shares risks with financial institutions on certain projects, and measures and recognizes the risk exposures to ensure that business risks are under control.

Independent Auditors' Report

Independent auditors' report on the consolidated financial statements summary to the Board of Directors of Huawei Investment & Holding Co., Ltd.

Opinion

The consolidated financial statements summary of Huawei Investment & Holding Co., Ltd. and its subsidiaries (the Group) set out on pages 92 to 134, which comprises the summary consolidated statement of financial position as at December 31, 2023, the summary consolidated statement of profit or loss and other comprehensive income and the summary consolidated statement of cash flows for the year then ended, and related notes, is derived from the audited consolidated financial statements of the Group for the year ended December 31, 2023.

In our opinion, the accompanying consolidated financial statements summary is consistent, in all material respects, with the audited consolidated financial statements, on the basis described in note 2 to the consolidated financial statements summary.

Consolidated financial statements summary

The consolidated financial statements summary does not contain all the disclosures required by IFRS Accounting Standards. Reading the consolidated financial statements summary and our report thereon, therefore, is not a substitute for reading the audited consolidated financial statements of the Group and our report thereon.

The audited consolidated financial statements and our report thereon

We expressed an unmodified audit opinion on the audited consolidated financial statements for the year ended December 31, 2023 in our report dated March 27, 2024.

Management's responsibilities for the consolidated financial statements summary

Management is responsible for the preparation of the consolidated financial statements summary on the basis described in note 2 to the consolidated financial statements summary.

Auditors' responsibilities

Our responsibility is to express an opinion on whether the consolidated financial statements summary is consistent, in all material respects, with the audited consolidated financial statements based on our procedures, which were conducted in accordance with International Standard on Auditing 810 (Revised), *Engagements to Report on Summary Financial Statements*.

KPMG Huazhen LLP
Certified Public Accountants
15th Floor, China Resources Tower
2666 Keyuan South Road
Shenzhen 518052, China

March 27, 2024

Consolidated Financial Statements Summary

Summary Consolidated Statement of Profit or Loss and Other Comprehensive Income

(CNY million)	Note	2023	2022
Revenue	8	**704,174**	642,338
Cost of sales		**(378,810)**	(360,413)
Gross profit		**325,364**	281,925
Research and development expenses		**(164,721)**	(161,494)
Selling and administrative expenses		**(118,923)**	(109,785)
Other income, net	9	**62,681**	31,570
Operating profit		**104,401**	42,216
Finance income and expenses	11	**(6,659)**	1,018
Share of associates' and joint ventures' results (post tax)		**(146)**	712
Profit before tax		**97,596**	43,946
Income tax	12	**(10,646)**	(8,384)
Profit for the year		**86,950**	35,562
Other comprehensive income (after tax and reclassification adjustments)	13		
Items that will not be reclassified to profit or loss:			
Re-measurement of defined benefit obligations		**133**	65
Equity investments at fair value through other comprehensive income (FVOCI) - net change in fair value		**1,350**	(1,169)
		1,483	(1,104)
Items that may be reclassified subsequently to profit or loss:			
Non-equity financial assets at FVOCI - net change in fair value and impairment loss		**172**	(250)
Translation differences on foreign operations		**1,225**	3,514
Share of other comprehensive income of associates and joint ventures		**1**	(1)
		1,398	3,263
Other comprehensive income		**2,881**	2,159
Total comprehensive income		**89,831**	37,721
Profit for the year attributable to:			
Equity holders of the Company		**86,893**	35,534
Non-controlling interests		**57**	28
		86,950	35,562
Total comprehensive income attributable to:			
Equity holders of the Company		**89,773**	37,694
Non-controlling interests		**58**	27
		89,831	37,721

The notes on pages 96 to 134 form part of this consolidated financial statements summary.

Summary Consolidated Statement of Financial Position

(CNY million)	Note	December 31, 2023	December 31, 2022
Assets			
Property, plant and equipment	14	**156,495**	137,024
Goodwill and intangible assets	15	**8,537**	8,048
Right-of-use assets	29	**25,402**	23,286
Interests in associates and joint ventures	16	**7,336**	7,109
Other investments and derivatives	17	**154,510**	83,055
Deferred tax assets	18	**12,456**	11,760
Contract assets	20	**1,340**	1,025
Trade and bills receivable	21	**7,014**	3,073
Other assets	22	**17,413**	14,628
Non-current assets		**390,503**	289,008
Inventories and other contract costs	19	**154,558**	163,282
Contract assets	20	**52,546**	51,502
Trade and bills receivable	21	**102,050**	87,804
Other assets	22	**88,141**	98,451
Other investments and derivatives	17	**282,896**	226,488
Cash and cash equivalents	23	**192,903**	147,269
Current assets		**873,094**	774,796
Total assets		**1,263,597**	1,063,804
Equity			
Equity attributable to equity holders of the Company		**507,428**	436,975
Non-controlling interests		**140**	101
Total equity		**507,568**	437,076
Liabilities			
Loans and borrowings	24	**291,688**	183,183
Deferred tax liabilities	18	**3,433**	3,804
Lease liabilities		**7,460**	7,275
Other liabilities	27	**2,016**	2,608
Non-current liabilities		**304,597**	196,870
Loans and borrowings	24	**16,726**	13,961
Employee benefits		**98,861**	97,697
Income tax payable		**6,687**	4,217
Trade and bills payable	25	**90,845**	92,104
Contract liabilities	26	**95,101**	87,575
Lease liabilities		**3,375**	3,296
Other liabilities	27	**119,668**	114,426
Provisions	28	**20,169**	16,582
Current liabilities		**451,432**	429,858
Total liabilities		**756,029**	626,728
Total equity and liabilities		**1,263,597**	1,063,804

The notes on pages 96 to 134 form part of this consolidated financial statements summary.

Summary Consolidated Statement of Cash Flows

(CNY million)	Note	2023	2022
Cash receipts from goods and services		**770,927**	711,048
Cash paid to suppliers and employees		**(757,254)**	(746,228)
Other operating cash flows		**56,134**	52,977
Net cash generated from operating activities		**69,807**	17,797
Net cash (used in)/generated from investing activities		**(98,759)**	6,270
Net cash generated from/(used in) financing activities		**73,193**	(8,622)
Cash and cash equivalents			
Net increase		**44,241**	15,445
At January 1		**147,269**	128,395
Effect of foreign exchange rate changes		**1,393**	3,429
At December 31	23	**192,903**	147,269

The notes on pages 96 to 134 form part of this consolidated financial statements summary.

Notes to the Consolidated Financial Statements Summary

1 Reporting entity

Huawei Investment & Holding Co., Ltd. (the Company) is a limited liability company established in Shenzhen in the People's Republic of China (PRC). The Company's registered office is at Building 1, Zone B, Huawei Base, Bantian, Longgang District, Shenzhen City, PRC. The Company's ultimate controlling party is the Union.

The Company and its subsidiaries (the Group) principally provide information and communications technology (ICT) infrastructure and smart devices. This includes providing products, services and solutions to customers in the fields of communications networks, IT, smart devices, cloud services, digital power and intelligent automotive solutions. The principal activities and other particulars of the Company's major subsidiaries are set out in note 32(b) to the consolidated financial statements summary.

2 Preparation basis of the consolidated financial statements summary

The Group has prepared a full set of consolidated financial statements (consolidated financial statements) for the year ended December 31, 2023 in accordance with IFRS Accounting Standards.

The consolidated financial statements summary has been prepared and presented based on the audited consolidated financial statements for the year ended December 31, 2023 in order to disclose material financial information relating to the Group's business operation.

3 Material accounting policies

(a) Basis of preparation of the consolidated financial statements

The consolidated financial statements have been prepared under the historical cost basis modified for the fair valuation of some financial instrument classifications (see note 3(e)).

The preparation of the consolidated financial statements requires management to make judgments, estimates and assumptions that affect the application of policies and reported amounts of assets, liabilities, income and expenses.

Estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed regularly and revised when required. Revisions to accounting estimates are recognized in the period in which the estimate is revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

Judgments made by management in the application of IFRS Accounting Standards that have significant effect on the consolidated financial statements and major sources of estimation uncertainty are discussed in note 4.

(b) Functional and presentation currency

All financial information in the consolidated financial statements summary is presented in millions of Chinese Yuan (CNY), which is the Company's functional currency.

(c) Consolidation

(i) Business combinations

The Group accounts for business combinations using the acquisition method when the acquired set of activities and assets meets the definition of a business and control is transferred to the Group. To be considered a business, an acquiree must comprise inputs and a substantive process that together significantly contribute to the ability to create outputs.

The Group may determine that an acquired set of activities and assets is not a business if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets.

The consideration transferred in the acquisition is generally measured at fair value, as are the identifiable assets and liabilities. Any goodwill that arises is tested annually for impairment (see note 3(k)(ii)). Any gain on a bargain purchase is recognized in profit or loss immediately. Transaction costs are expensed as incurred.

(ii) Subsidiaries

The financial statements consolidate the results, assets, liabilities and cash flows of all subsidiaries which the Group controls.

Subsidiaries are consolidated from the date that control commences until the date that control ceases. Intra-group balances, transactions, cash flows and any unrealized gains arising from intra-group transactions are eliminated in preparing the consolidated financial statements. Unrealized losses resulting from intra-group transactions are eliminated in the same way as unrealized gains but only to the extent that there is no evidence of impairment.

The Group controls an entity when it is exposed, or has rights, to variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. When assessing whether the Group has power, only substantive rights are considered.

(iii) Non-controlling interests

Non-controlling interests represent the carrying value of the net assets of subsidiaries attributable to non-controlling equity holders. The Group measures non-controlling interests at the non-controlling interests' proportionate share of the subsidiary's net identifiable assets. Changes in the Group's interests in a subsidiary that do not result in a loss of control are accounted for as equity transactions, whereby adjustments are made to the amounts of controlling and non-controlling interests within consolidated equity to reflect the change in relative interests, but no adjustments are made to goodwill and no gain or loss is recognized.

(iv) Loss of control

When the Group loses control of a subsidiary, it is accounted for as a disposal of the entire interest in that subsidiary, with a resulting gain or loss being recognized in profit or loss. Any interest retained in that former subsidiary at the date when control is lost is recognized at fair value or, when appropriate, the cost on initial recognition of an investment in an associate or a joint venture (see note 3(d)).

(d) Associates and joint ventures

An associate is an entity in which the Group has significant influence, but not control or joint control, over its management, including participation in the financial and operating policy decisions.

A joint venture is an arrangement whereby the Group and other parties contractually agree to share control of the arrangement, and have rights to the net assets of the arrangement.

An investment in an associate or a joint venture is accounted for in the consolidated financial statements using the equity method until the date on which significant influence or joint control ceases. It is initially recognized at cost and subsequently adjusted to include the Group's share of the profit or loss and other comprehensive income (OCI) of the associate or the joint venture.

Unrealized profits and losses resulting from transactions between the Group and its associates and joint ventures are eliminated to the extent of the Group's interest in the investee, except where unrealized losses provide evidence of an impairment of the asset transferred, in which case they are recognized immediately in profit or loss.

(e) Financial instruments

(i) Recognition and derecognition

Financial instruments, comprising financial assets and financial liabilities, are recognized in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the instrument.

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred or where it neither transfers nor retains substantially all of the risks and rewards of ownership and loses control. When control is retained, the Group continues to recognize the financial asset to the extent of its continuing involvement. Financial assets are also derecognized when they are written off. Financial assets are written off when there is no reasonable expectation of further recoveries even though there may be enforcement actions ongoing.

The Group derecognizes a financial liability when its contractual obligations are discharged, canceled, or expire.

Financial assets and financial liabilities are offset and the net amount presented in the consolidated statement of financial position when, and only when, the Group currently has a legally enforceable right to set off the recognized amounts and intends either to settle them on a net basis or to realize the asset and settle the liability simultaneously.

(ii) Classification and measurement

All financial assets and liabilities are initially recognized at fair value, with the exception of trade receivables without a significant financing component, which are measured at their transaction price, determined in accordance with the Group's accounting policies for revenue. Subsequently, measurement depends on the financial assets/liabilities classification as follows:

- Financial assets measured at fair value through profit or loss (FVPL)

  Non-equity financial assets are classified as FVPL if they arise from contracts which do not give rise to cash flows which are solely principal and interest, or otherwise where they are held in a business model which mainly realizes them through sale. Such assets are re-measured to fair value at the end of each reporting period. Gains and losses arising from re-measurement are taken to profit or loss, as are transaction costs.

  Equity investments are classified as FVPL unless they are designated as at FVOCI on initial recognition (see below). Dividends from equity investments, irrespective of whether classified as FVPL or FVOCI, are recognized in profit or loss as finance income.

- Financial assets measured at FVOCI

  Non-equity financial assets are classified as FVOCI where they arise from contracts that give rise to contractual cash flows which are solely principal and interest and that are held in a business model which realizes some through sale and some by holding them to settlement. They are recognized initially at fair value plus any directly attributable transaction costs, or in the case of trade receivables, at the transaction price.

  At the end of each reporting period they are re-measured to fair value, with the cumulative gain or loss compared to their amortized cost (AC) being recognized as fair value reserve through other comprehensive income, except for the recognition in profit or loss of expected credit losses, interest income (calculated using the effective interest method) and foreign exchange gains and losses.

  When these assets are derecognized, the cumulative gain or loss is reclassified from equity to profit or loss.

  Equity investments are designated as at FVOCI where they are considered strategic to the Group. Such designation is made on an instrument-by-instrument basis, but may only be made if the investment meets the definition of equity from the issuer's perspective. Amounts accumulated in the fair value reserve in respect of these investments are transferred directly to retained earnings on the disposal of the investment. These investments are not subject to impairment.

- Financial assets measured at amortized cost

  Financial assets are held at amortized cost when they arise from contracts that give rise to contractual cash flows which are solely principal and interest and are held in a business model that mainly holds the assets to collect contractual cash flows.

  Financial assets measured at amortized cost when they are not purchased or originated credit-impaired are measured at amortized cost using the effective interest method. For those purchased or originated credit-impaired, the Group applies the credit-adjusted effective interest rate since initial recognition. These assets are also subject to impairment losses (see note 3(k)). Interest income is calculated based on the gross carrying amount of the financial asset unless the financial asset is credit impaired, in which case interest income is calculated on the amortized cost (i.e. gross carrying amount less loss allowance). Interest income is included in finance income.

- Financial liabilities

  Financial liabilities are classified as measured at amortized cost or FVPL. A financial liability is classified as FVPL if it is a derivative, contingent consideration or it is designated

as such on initial recognition. Other financial liabilities are stated at amortized cost using the effective interest method. Interest is included in finance expenses unless capitalized into an asset (see note 3(t)).

- Derivative financial instruments

  Derivative financial instruments are recognized at fair value. At the end of each reporting period the fair value is re-measured. Derivatives are classified as assets when their fair value is positive or as liabilities when their fair value is negative. The gain or loss on re-measurement to fair value is recognized immediately in profit or loss, except where the derivatives are accounted for as hedges of a net investment in a foreign operation (see note 3(f)).

(f) Hedge accounting

The Group holds certain derivatives to hedge the foreign exchange risk on net investments in foreign operations.

At the inception of the hedging relationship, the Group documents the risk management objective, the strategy for undertaking the hedge, and the economic relationship between the hedged item and the hedging instrument, including whether the value changes of the hedged item and the hedging instrument are expected to offset each other.

Hedge effectiveness is assessed on an ongoing basis at the hedging commencement date and each subsequent reporting date. A hedge is considered effective when:

(i) there is an economic relationship between the hedged item and the hedging instrument;

(ii) the effect of credit risk does not dominate the value changes that result from that economic relationship; and

(iii) the hedge ratio of the hedging relationship is the same as that resulting from the quantity of the hedged item that the Group actually hedges and the quantity of the hedging instrument that the Group actually uses to hedge that quantity of hedged item.

When a hedging relationship is no longer effective because of changes in the hedge ratio, but the risk management objective for the designated hedging relationship remains the same, the Group adjusts the hedge ratio so that it meets the qualifying criteria again.

To the extent that the hedge is effective, changes in the fair value of the derivative are recognized in other comprehensive income and presented within equity. Gains and losses representing hedge ineffectiveness are recognized in profit or loss. The balances from any hedging relationships for which hedge accounting is no longer applied remain in the translation reserve. The cumulative amount recognized in other comprehensive income is reclassified to profit or loss as a whole or in part on disposal or partial disposal of the foreign operation.

(g) Investment property

Investment properties are land and buildings which are owned or held under a leasehold interest (see note 3(j)) to earn rental income and/or for capital appreciation.

Investment properties are stated at cost less accumulated depreciation (see note 3(h)(ii)) and impairment losses (see note 3(k)). Rental income from investment properties is accounted for as described in note 3(q)(ii).

(h) Other property, plant and equipment

(i) Cost

Items of property, plant and equipment are stated at cost less accumulated depreciation and impairment losses (see note 3(k)). Cost includes expenditure that is directly attributable to the acquisition of the assets including for self-constructed assets, the cost of materials, direct labor, the initial estimate, where appropriate, of the costs of dismantling and removing the items and restoring the site on which they are located, and an appropriate proportion of production overheads and borrowing costs.

Construction in progress is transferred to other property, plant and equipment when it is ready for its intended use.

Gains or losses arising from the retirement or disposal of an item of property, plant and equipment are determined as the difference between the net disposal proceeds and the carrying amount of the item and are recognized in profit or loss on the date of retirement or disposal.

(ii) Depreciation

Depreciation is calculated to write off the cost of items of investment property and other property, plant and equipment, less their estimated residual value, if any, using the straight-line method over their estimated useful lives as follows:

■ Buildings	30 years
■ Machinery	2 to 10 years
■ Motor vehicles	5 years
■ Electronic and other equipment	2 to 5 years
■ Decoration and leasehold improvements	2 to 15 years

Where components of an item of investment property and other property, plant and equipment have different useful lives, the cost of the item is allocated on a reasonable basis between the parts and each part is depreciated separately. Both the useful life of an item of investment property and other property, plant and equipment and its residual value, if any, are reviewed annually.

Freehold land and construction in progress are not depreciated.

(i) Goodwill and intangible assets

(i) Goodwill

Goodwill represents the excess of the fair value of consideration paid to acquire a subsidiary over the acquisition date fair value of the acquiree's identifiable assets acquired less liabilities, including contingent liabilities, assumed as at the acquisition date, less impairment losses (see note 3(k)(ii)).

(ii) Other intangible assets

Other intangible assets are stated at cost less accumulated amortization and impairment losses (see note 3(k)).

(iii) Amortization

Goodwill is not amortized but subject to impairment testing (see note 3(k)(ii)) annually.

The cost of other intangible assets with finite useful lives is amortized to profit or loss on a straight-line basis over the assets' estimated useful lives from the date they are available for use. Their estimated useful lives are as follows:

■ Software	2 to 10 years
■ Patents and royalties	2 to 10 years
■ Trademark and others	2 to 20 years

Both the useful lives and method of amortization are reviewed annually and revised when necessary.

(iv) Research and development

Research and development costs are all costs directly attributable to research and development activities together with costs which can be allocated on a reasonable basis to such activities. The nature of the Group's research and development activities is such that the criteria for the recognition of such costs as assets are generally not met until late in the development stage of the project when the remaining development costs are immaterial. Therefore, expenditure on research and development activities is generally recognized as an expense in the period in which it is incurred.

(j) Leases

A contract is, or contains, a lease if on inception the contract conveys the right to control the use of an identified asset for a period of time, the lease term, in exchange for consideration.

The lease term is the non-cancelable period of the lease, together with any additional periods, when there is an enforceable option to extend the lease and it is reasonably certain that the Group will extend the term, or when there is an option to terminate the lease and it is reasonably certain that the Group will not exercise the right to terminate. The lease term is reassessed if there is a significant change in circumstances.

(i) As a lessee

At commencement, or on the modification, of a contract that contains a lease component, the Group allocates the consideration in the contract to each lease component on the basis of its relative stand-alone price.

The Group recognizes a right-of-use asset and a lease liability at the lease commencement date. The right-of-use asset is initially measured at cost, which comprises the initial amount of the lease liability adjusted for any lease payments made at or before the commencement date, plus any initial direct costs incurred and an estimate of costs to

dismantle and remove the underlying asset or to restore the underlying asset or the site on which it is located, less any lease incentives received.

The right-of-use asset is subsequently depreciated using the straight-line method from the commencement date to the end of the lease term. If the lease transfers ownership of the underlying asset to the Group by the end of the lease term or if the Group expects to exercise a purchase option, the right-of-use asset will be depreciated over the useful life of the underlying asset, which is determined on the same basis as those of the Group's other property, plant and equipment.

Right-of-use assets are further reduced by impairment losses, if any, and adjusted for certain re-measurements of the lease liability.

The lease liability is initially measured at the present value of the total lease payments that are not paid on the commencement date, discounted using either the interest rate implicit in the lease, if readily determinable, or more usually, an estimate of the Group's incremental borrowing rate on the inception date for a loan with similar terms to the lease.

The incremental borrowing rate is estimated by obtaining interest rates from various external financing sources and making certain adjustments to reflect the terms of the lease and type of the asset leased.

Lease payments included in the measurement of the lease liability comprise the following:

- fixed payments, including payments which are substantively fixed;
- variable lease payments that depend on an index or a rate, initially measured using the index or rate as at the commencement date;
- amounts expected to be payable under a residual value guarantee; and
- the exercise price under a purchase option that the Group is reasonably certain to exercise, lease payments in an optional renewal period if the Group is reasonably certain to exercise an extension option, and penalties for early termination of a lease unless the Group is reasonably certain not to terminate early.

The lease liability is measured at amortized cost using the effective interest method. It is re-measured when there is a change in future lease payments arising from a change in an index or rate, if there is a change in the Group's estimate of the amount expected to be payable under a residual value guarantee, if the Group changes its assessment of whether it will exercise a purchase, extension or termination option or if there is a revised in-substance fixed lease payment.

When the lease liability is re-measured in this way, a corresponding adjustment is made to the carrying amount of the right-of-use asset, or is recorded in profit or loss if the carrying amount of the right-of-use asset has been reduced to zero.

Short-term leases and leases of low-value assets

As permitted by IFRS 16 Leases, the Group does not recognize right-of-use assets and lease liabilities for leases of low-value assets and short-term leases. Payments associated with these leases are recognized as an expense on a straight-line basis over the lease term.

(ii) As a lessor

When the Group acts as a lessor, it determines at lease inception whether each lease is a finance lease or an operating lease.

To classify each lease, the Group makes an overall assessment of whether the lease transfers substantially all of the risks and rewards incidental to ownership of the underlying asset. If this is the case, then the lease is a finance lease; if not, then it is an operating lease.

When the Group is an intermediate lessor, it accounts for its interest in the head lease and the sub-lease separately. It assesses the lease classification of a sub-lease with reference to the right-of-use asset arising from the head lease, not with reference to the underlying asset. If a head lease is a short-term lease to which the Group applies the exemption described above, then it classifies the sub-lease as an operating lease.

The Group recognizes lease payments received under operating leases as income on a straight-line basis over the lease term as part of revenue (see note 3(q)(ii)).

(k) Impairment of assets

(i) Impairment of financial assets, contract assets and lease receivables

The Group recognizes an allowance for impairment on non-equity financial assets held at FVOCI and AC, and also on contract assets and lease receivables on an expected credit loss basis. Increases and decreases in the impairment allowance are recognized in profit or loss. The expected credit losses are the difference (on a present value basis) between the contractual cash flows (or transaction price) and the present value of cash flows expected to be received based on the Group's past loss experience and reasonable and supportable expectations, at the end of the reporting period, about future credit conditions.

For trade receivables, contract assets and lease receivables, the Group recognizes impairment both individually and using provision matrices based on the probability that the customer will default during the lifetime of the asset, and the loss that will be incurred given the default (the lifetime expected loss). The Group defines default as the customer being more than 90 days past due.

For all other financial assets that are not purchased or originated credit-impaired, the Group recognizes impairment initially based on the probability that the customer or counterparty will default in the next 12 months unless there has been a significant deterioration in credit quality, or the financial asset becomes credit impaired in which case the impairment allowance is increased to the lifetime expected loss.

An asset is credit-impaired when it has one or more of the loss events described below:

- significant financial difficulty of the borrower or issuer;
- a breach of contract, such as a default or past due event;
- the restructuring of a loan or advance by the Group on terms that the Group would not consider otherwise;
- it is probable that the borrower will enter bankruptcy or other financial reorganization; or
- the disappearance of an active market for a security because of financial difficulties of the issuer.

In the case of purchased or originated credit-impaired financial assets, the Group only recognizes the cumulative changes in lifetime expected credit losses since initial recognition as a loss allowance.

(ii) Impairment of other non-financial assets

Internal and external sources of information are reviewed at the end of each reporting period to identify indications that non-financial assets, including property, plant and equipment, right-of-use assets, intangible assets and other long-term assets may be impaired.

Goodwill is tested for impairment at least annually. For the purposes of impairment testing, goodwill is allocated to each cash generating unit, or a group of cash generating units, that is expected to benefit from the synergies of the acquisition. Where impairment testing is of a cash generating unit (or group of units), an impairment loss is recognized in profit or loss where the recoverable amount is less than the carrying amount of the unit (or group of units) and the impairment loss recognized is allocated first to reduce the carrying amount of any goodwill allocated to the unit (or group of units).

Other assets are impaired and an impairment loss is recognized in profit or loss where the recoverable amount of the asset is less than its carrying amount, and reversed where there has been a favorable change in the recoverable amount. Impairment of goodwill is not reversed.

The recoverable amount of an asset or group of assets is the greater of its fair value less costs of disposal and value in use. Value in use is the total estimated future cash flows from the asset or, where the asset does not generate cash flows independent of other assets, a group of assets, discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset, or group of assets.

(l) Inventories

Inventories are assets which are held for sale in the ordinary course of business, in the process of production for such sales or in the form of material or supplies to be consumed in the production process or in the rendering of services.

Inventories are carried at the lower of cost and net realizable value.

Cost is calculated based on the standard cost method with periodic adjustments of cost variance to arrive at the actual cost, which approximates to weighted average cost. Cost includes expenditures incurred in acquiring the inventories and bringing them to their present location and condition. The cost of manufactured inventories and work in progress includes an appropriate share of overheads based on normal operating capacity.

Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and the estimated costs necessary to make the sale.

When inventories are sold, the carrying amount of those inventories is recognized as an expense in the period in which the related revenue is recognized. Any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs.

(m) Cash and cash equivalents

Cash and cash equivalents comprise cash at bank and on hand, demand deposits with banks and other financial institutions, demand deposits with third party merchants, and short-term, highly liquid investments that are readily convertible into known amounts of cash and which are subject to an insignificant risk of changes in value, having been within three months of maturity at acquisition. Bank overdrafts that are repayable on demand and form an integral part of the Group's cash management are also included as a component of cash and cash equivalents for the purpose of the consolidated statement of cash flows.

(n) Employee benefits

(i) Short-term employee benefits, contributions to defined contribution retirement plans and other long-term employee benefits

Salaries, profit-sharing and bonus payments, paid annual leave and contributions to defined contribution retirement plans and non-monetary benefits are recognized as liabilities and in profit or loss or in the cost of related assets in the period in which the associated services are rendered by employees. Where payment or settlement is expected to be made 12 months after the end of the reporting period, these amounts are discounted and stated at their present values.

(ii) Defined benefit obligations

The Group's obligation in respect of defined benefit plans is calculated separately for each plan by estimating the total amount of future benefit that employees have earned in return for their service in the current and prior periods which is then discounted to present value. The calculation is performed by management using the projected unit credit method.

Service cost and interest cost on the defined benefit obligations and any curtailment gains and losses are recognized in profit or loss. Re-measurements arising from changes in actuarial assumptions regarding the amounts of future benefits are recognized immediately in other comprehensive income and shall not be reclassified to profit or loss in a subsequent period. However, the Group may transfer those amounts recognized in other comprehensive income within equity.

(o) Income tax

Income tax expense comprises current and deferred tax. It is recognized in profit or loss except to the extent that it relates to a business combination, or items recognized in other comprehensive income or directly in equity.

Current tax comprises the expected tax payable or receivable on the taxable income or loss for the year and any adjustment to the tax payable or receivable in respect of prior years. The amount of current tax payable or receivable is the best estimate of the tax amount expected to be paid or received that reflects uncertainty, if any. It is measured using tax rates enacted or substantively enacted at the reporting date. Current tax also includes any tax arising from dividends.

Deferred tax is recognized in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and their tax bases. Deferred tax assets also arise from unused tax losses and unused tax credits. Deferred tax is not recognized for:

- temporary differences on the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss and does not give rise to equal taxable and deductible temporary differences;
- temporary differences related to investments in subsidiaries, associates and joint arrangements to the extent that the Group is able to control the timing of the reversal of the temporary differences and it is probable that they will not reverse in the foreseeable future;
- taxable temporary differences arising on the initial recognition of goodwill; and
- those related to the income taxes arising from tax laws enacted or substantively enacted to implement the Pillar Two model rules published by the Organization for Economic Co-operation and Development.

Deferred tax assets are recognized to the extent that it is probable that future taxable profits will be available against which the asset can be utilized. Future taxable profits are determined based on the reversal of relevant taxable temporary differences. If the amount of taxable temporary differences is insufficient to recognize a deferred tax asset in full, then future taxable profits, adjusted for reversals of existing temporary differences, are considered, based on the business plans for individual subsidiaries in the Group. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realized; such reductions are reversed when the probability of future taxable profits improves.

The amount of deferred tax recognized is measured based on the expected manner of realization or settlement of the carrying amount of the assets and liabilities, using tax rates enacted or substantively enacted at the reporting date. Deferred tax assets and liabilities are not discounted.

A provision is recognized for those matters for which the tax determination is uncertain but it is considered probable that there will be a future outflow of funds to a tax authority. The provisions are measured at the best estimate of the amount expected to become payable.

Current tax balances and deferred tax balances, and movements therein, are presented separately from each other and are not offset. Current tax assets are offset against current tax liabilities, and deferred tax assets against deferred tax liabilities, if the Group has legally enforceable rights to set off current tax assets against current tax liabilities and the following additional conditions are met:

- in the case of current tax assets and liabilities, the Group intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously; or
- in the case of deferred tax assets and liabilities, if they relate to income taxes levied by the same taxation authority on either:
  - the same taxable entity; or
  - different taxable entities, which, in each future period in which significant amounts of deferred tax liabilities or assets are expected to be settled or recovered, intend to realize the current tax assets and settle the current tax liabilities on a net basis or realize and settle simultaneously.

(p) Provisions and contingent liabilities

Provisions are recognized for liabilities of uncertain timing or amount when the Group has a legal or constructive obligation arising as a result of a past event, it is probable that an outflow of economic benefits will be required to settle the obligation and a reliable estimate can be made. Where the time value of money is material, provisions are stated at the present value of the expenditure expected to settle the obligation.

Where it is not probable that an outflow of economic benefits will be required, or the amount cannot be reliably estimated, disclosure is made of the contingent liability, unless the probability of outflow of economic benefits is remote. Possible obligations, whose existence will only be confirmed by the occurrence or non-occurrence of one or more future events are also disclosed as contingent liabilities unless the probability of outflow of economic benefits is remote.

The main types of provisions are as follows:

(i) Provision for warranties

The Group provides assurance warranties for its standard products. The Group estimates the costs

that may be incurred under its assurance warranty obligations and records a liability in the amount of such costs when revenue is recognized. Warranty costs generally include spare parts, labor costs and service center support. Factors that affect the Group's warranty liability include the amount of products sold, and historical and anticipated rates of warranty claims. The Group periodically reassesses its warranty liabilities and adjusts the amounts as necessary.

(ii) Provision for onerous contracts

A provision for onerous contracts is recognized when the expected benefits to be derived by the Group from a contract are lower than the estimated cost of meeting its obligations under the contract. The provision is measured at the present value of the lower of the expected cost of terminating the contract and the expected net cost of continuing with the contract, which is determined based on the incremental costs of fulfilling the obligation under the contract and an allocation of other costs directly related to fulfilling the contract. Before a provision is established, the Group recognizes any impairment loss on the assets associated with that contract.

(q) Revenue

Revenue is income arising from sales of products, provision of services or use by others of the Group's properties under leases in the ordinary course of the Group's business.

(i) Revenue from customer contracts

Revenue is measured based on the consideration the Group expects to be entitled to, from the contract with the customer and excludes those amounts collected on behalf of third parties. The Group recognizes revenue when it transfers control over a good or service (or a bundle of goods or services) to a customer.

i. Contract combinations and modifications

The Group combines separate customer contracts with the same customer or related parties of the same customers entered into at or near the same time when those contracts are negotiated as a package to form a single commercial objective, contain significant pricing dependencies or the goods or services promised in the contracts are a single performance obligation.

Contract modifications are generally treated either as a new separate contract, or as a prospective change to an existing contract. In cases when the additional or the remaining goods and services are not distinct from those transferred before the date of modification, modifications are accounted for through a cumulative catch-up adjustment.

ii. Warranties

If a warranty attached to a product sold by the Group is a distinct service in addition to standard assurance, the Group recognizes the warranty service as a separate performance obligation (POB) for which revenue is allocated and recognized on a straight-line basis over the warranty period. Otherwise, warranties provided by the Group are standard assurance and accounted for as a warranty provision at the time of the sale (see note 3(p)).

iii. Timing of revenue recognition

The Group determines at contract inception whether it transfers the control of a good or service (or a bundle of goods or services) underlying a POB to the customer over time or at a point in time. A POB is satisfied and related revenue is recognized over time by measuring the progress towards complete satisfaction of that POB, if one of the following criteria is met:

- the customer simultaneously receives and consumes the benefits provided by the Group's performance as the Group performs;
- the Group's performance creates or enhances an asset that the customer controls as the asset is created or enhanced; or
- the Group's performance does not create an asset with an alternative use to the Group and the Group has an enforceable right to payment for performance completed to date.

If a POB is not satisfied over time and the control over the related good or service is not transferred over time in accordance with the above criteria, it is recognized at a point in time when control is transferred.

iv. Variable consideration

Revenue is measured at the fair value of the consideration received or receivable, adjusted at contract inception for penalties, price concessions,

returns, trade discounts, volume rebates and other sales incentives, such as coupons, provided that the level of expected return of goods, volume rebates and other incentives given can be estimated reliably and that revenue is only recognized to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur. When making an estimate for variable consideration, the Group considers several factors, including but not limited to, contract commitments, business practices, historical experience, customer take-up rates, and expected purchase volumes.

v. Significant financing component

The amount of consideration in a sales contract is adjusted for the existence of significant financing component in determining the transaction price only when the payment term exceeds one year in duration between performance and the expected payment date.

The Group recognizes interest income where payment is received more than one year in arrears of satisfaction of a performance obligation, reflecting a deemed lending of cash to a customer. Such interest income is presented in finance income.

The Group adopts the practical expedient under IFRS 15 *Revenue from Contracts with Customers* (IFRS 15) and does not account for the significant financing components where the Group anticipates at contract inception that the timing difference between transfer of control of a good or service to a customer, and the expected customer payment for that good or service will be one year or less.

vi. Stand-alone selling prices (SSP)

The transaction price of a contract with a customer is allocated to each POB in proportion to its SSP.

The Group uses directly observable SSP or estimated SSP in allocating transaction price to products. In establishing the estimated SSP, the Group mainly uses an average price approach by product category. Average price of a product is calculated with reference to the historical stand-alone product sale transactions for the product and the product category is determined with reference to the product family and geographical region.

For services that are regularly sold on a stand-alone basis, most of such services are customized and priced on a project basis, therefore the transaction prices generally reflect the SSP. For the services where an observable transaction price is unavailable such as the services sold in a bundle with products, the Group determines the SSP using a cost-plus approach, taking into account several factors, including but not limited to labor cost, competition and company business strategy.

When a significant discount is granted and is specifically attributable to one or more POB, that discount is allocated to the identified POB(s) if the allocation reflects the Group's regular sales pattern. In all other cases the discount is allocated to the contract as a whole.

vii. Contract assets and liabilities

A contract asset arises when revenue is recognized under a contract with a customer before the Group becomes unconditionally entitled to consideration. Contract assets are reclassified to trade receivables when the right to consideration becomes unconditional.

When consideration is received (or the right to consideration is unconditional) before the related revenue is recognized, a contract liability is recognized.

For a single contract with the customer, either a net contract asset or a net contract liability is presented. For multiple contracts, contract assets and contract liabilities of unrelated contracts are not presented on a net basis.

Trade receivables are recognized when the right to consideration under a revenue contract becomes unconditional, regardless of the billing date.

viii. Refund liabilities

A refund liability, such as for rebates to customers, other sales-based incentives granted, and expected product returns, is recognized when the Group expects to refund some or all of the customer contract consideration. Refund liabilities are presented in other liabilities in the consolidated statement of financial position.

ix. Contract costs

Certain incremental acquisition costs (those paid to acquire a contract such as commission) and

fulfilment costs (those incurred to deliver services to customers) are initially capitalized to the extent that the costs are recoverable, and subsequently recognized as expense over the period of expected benefit, which is generally the associated contract duration.

Incremental acquisition costs are expensed as incurred where the amortization period of the asset that would have been recognized is one year or less.

The Group recognizes a contract cost impairment when the carrying amount of unamortized contract costs exceeds the difference between the remaining consideration expected and the associated contract costs relating to providing those goods and services under the contract.

The Group divides its business into five operating segments: ICT Infrastructure Business, Consumer Business, Cloud Computing Business, Digital Power Business and Intelligent Automotive Solution Business. The principal business activities of each segment are described in note 7. The specific revenue accounting policies applied by the Group in relation to the main activities, based on the characteristics of contracts and the business practices of the segments, are described below:

ICT Infrastructure Business

In the ICT infrastructure business, whose customers include telecom carriers and governments and enterprises, contracts typically involve multiple promises, including sales of equipment, software and a wide range of services, which are usually separate POBs. When the Group provides bespoke end-to-end solutions, such as data center projects and turnkey projects, if the goods and services in the contract are not distinct, the solution contract contains one single POB. Except for those related to certain standard products for government and enterprise customers, warranties provided for ICT infrastructure business products are generally recognized as a distinct service.

There are two sales patterns within the ICT infrastructure business. One is direct sales to end customers and the other is distribution through channel partners. Generally, the Group directly sells to carrier customers, and payments are received according to the payment milestones set out in the contracts before or after the obligations are fulfilled, usually including advance, delivery, and completion payment milestones. The control of goods is transferred to the customer when the goods are delivered to the customer's designated location or installed. The Group usually sells to government and enterprise customers through distribution channels. If a distribution channel is the principal, the control of goods is generally transferred when the goods are delivered to the location designated by the channel. If the channel is an agent, the control of goods is transferred when the goods are delivered to the location designated by the second-tier channels or end-users that meet the criteria for a principal.

In most cases, solutions recognized as a single POB and services meet the criteria for the transfer of control over time. The Group primarily uses the output method to measure progress. For services such as hardware installation, network integration, network optimization, and network planning, the Group divides the whole service into several delivery milestones according to the deliveries specified in the contract to measure the performance progress. For services such as customer support, managed services and training, the Group generally recognizes revenue using the straight-line method.

Consumer Business

The consumer business mainly provides terminal devices and services that can be sold on a stand-alone basis, such as mobile phones and tablets. The consumer business generally sells its products through distribution channels. Additionally, the Group sells products to consumers directly through self-operated online platforms and retail stores. Full payment is commonly received in advance. In most cases, control of the goods is transferred when the goods are delivered to distribution channels or consumers. The nature of warranties for terminal devices and accessories is generally standard assurance.

For third-party applications, goods and services sold through the Group's online platforms and distribution channels, the Group is a principal if it controls a promised good or service before it is transferred to a customer, otherwise the Group is an agent.

Cloud Computing Business

The cloud computing business mainly provides customers with cloud services, such as elastic computing, storage, networks, security, and databases. Cloud services are mainly classified into contracts with periodic service access or contracts with usage services, where the former is charged on a subscription basis and the latter is charged based on actual utilization. In both contract types, POBs are

satisfied over time and the Group recognizes revenue over the related contract period using a straight-line method or actual consumption volume multiplied by agreed charge rates.

Digital Power Business

The digital power business mainly sells products and solutions such as smart photovoltaics (PV), data center facilities, and DriveONE (including e-mobility products for new energy vehicles), and generally includes POBs of sales of equipment, installation services and operation and maintenance services. Except for DriveONE products that are directly sold to automobile manufacturers, the Group sells other digital power products primarily through distribution channels. In most cases, control of the goods is transferred when the goods are delivered to distribution channels. The nature of warranties for digital power products is generally standard assurance.

Intelligent Automotive Solution Business

The intelligent automotive solution business mainly provides automobile manufacturers with intelligent automotive components and accessories, automated driving systems and related services, primarily through a direct sales model. The control of goods is transferred to the customer when the goods are delivered to the customer's designated location. Revenue related to software and services is recognized when the control of software and services is transferred to the customer. The nature of warranties for intelligent automotive products is generally standard assurance.

(ii) Rental income from operating leases

Rental income receivable under operating leases is recognized in profit or loss in equal installments over the periods covered by the lease term, except where an alternative basis is more representative of the pattern of benefits to be derived from the use of the leased asset. Lease incentives granted are recognized in profit or loss as an integral part of the aggregate net lease payments receivable. Variable lease payments that do not depend on an index or a rate are recognized as income in the accounting period in which they are earned.

(r) Government grants

Government grants are recognized at fair value when there is reasonable assurance that they will be received and that the Group will comply with the conditions attached to them.

Grants that compensate the Group for the cost of an asset are initially recognized as deferred income and then recognized in profit or loss on a systematic and rational basis over the useful life of the related asset.

Grants that compensate the Group for expenses to be incurred in the future are initially recognized as deferred income and then recognized in profit or loss in the same periods in which the expenses are incurred. Otherwise, the grants are recognized in profit or loss directly.

(s) Translation of foreign currencies

(i) Foreign currency transactions

Foreign currency transactions during the year are translated into the respective functional currencies of group entities at the foreign exchange rates ruling at the transaction dates.

Monetary assets and liabilities denominated in foreign currencies are translated into the functional currency at the foreign exchange rates ruling at the end of the reporting period. Exchange gains and losses are recognized in profit or loss, except those arising from derivatives used to hedge net investments in foreign operations (see note 3(f)).

Non-monetary assets and liabilities that are measured in terms of historical cost in a foreign currency are translated using the foreign exchange rates ruling at the transaction dates. Non-monetary assets and liabilities denominated in foreign currencies that are stated at fair value are translated using the foreign exchange rates ruling at the dates the fair value was measured.

(ii) Foreign operations

The results of foreign operations, except for foreign operations in hyperinflationary economies, are translated into the presentation currency of the Group (CNY) at the exchange rates approximating the foreign exchange rates ruling at the dates of the transactions. Statement of financial position items are translated into CNY at the closing foreign exchange rates at the end of the reporting period. The resulting exchange differences are recognized in other comprehensive income and accumulated separately in equity in the translation reserve. If the operation is a non-wholly-owned subsidiary, then the relevant proportionate share of the translation difference is allocated to the non-controlling interests.

The results and financial position of foreign operations in hyperinflationary economies are translated to CNY at the exchange rates ruling at the end of the reporting period. Prior to translating the financial statements of foreign operations in hyperinflationary economies, their financial statements for the current year are restated to account for changes in the general purchasing power of the local currencies. The restatement is based on relevant price indices at the end of the reporting period.

When a foreign operation is disposed of in its entirety or partially such that control, significant influence or joint control is lost, the cumulative amount in the translation reserve related to that foreign operation is reclassified to profit or loss as part of the gain or loss on disposal.

(t) Borrowing costs

Borrowing costs that are directly attributable to the acquisition, construction or production of an asset which necessarily takes a substantial period of time to get ready for its intended use or sale are capitalized as part of the cost of that asset. Other borrowing costs are expensed in the period in which they are incurred.

4 Accounting judgments and estimates

Significant judgments and key sources of estimation uncertainty are as follows:

(a) Revenue recognition

Revenue is recognized when control of a good or service is transferred to a customer. Where revenue is recognized over time, the Group primarily uses the output method to measure progress. Judgments applied when using the output method include assessing progress and milestones achieved and determining if that represents the value of goods and/or services delivered to the customer to date. Where revenue is recognized at a point in time, the Group assesses the transfer of control by reference to the contractual terms and the circumstance of the arrangements including a consideration of past business practice, such as whether the Group has a legal right to payment, title has passed, the customer has the risks and rewards of ownership, or the customer is using the asset to generate value for themselves.

In determining the transaction price and the amounts allocated to performance obligations, variable consideration is estimated using the most likely amount or expected value based on the nature of the specific consideration and the analysis of relevant contract terms, considering historical, current and expected information. The collectability of a consideration is estimated at contract inception, based on the Group's assessment of the customer's ability and intention to pay when due, and is reassessed if there are significant changes in the facts and circumstances.

For sales to distribution channels, judgments and estimates are also applied in determining when the control of the goods is transferred to channels and at what amount revenue should be recognized. The judgments include whether the channel is a principal or an agent in a transaction, and whether the channel's next sale is part of one arrangement. The Group monitors the channel inventory level with reference to the channel's normal turnover cycle and sales forecast, taking into consideration various factors including product characteristics, historical experience, market demand and external competition. Revenue is only recognized when the control of the goods is transferred and to the extent that it is highly probable that a significant reversal will not occur.

The Group judges a contract modification as a separate contract when the increase in contract scope is due to additional distinct promised goods or services and the price increases reflect the SSP of such goods or services plus any appropriate adjustments. Otherwise, a contract modification is judged as a prospective change to an existing contract when the remaining goods or services are distinct from those transferred before the date of the modification, or accounted for as cumulative catch-up adjustment to the revenue when the new or remaining goods or services are not distinct from those transferred.

Estimation is inherent in revenue recognition and revenue may materially change if management's estimation were to change or be found inaccurate or with the occurrence of unexpected events.

(b) Impairment of trade receivables and contract assets

The credit risk of customers is regularly assessed with a focus on the customer's ability and willingness to pay, reflected by the Group's estimation of the expected credit loss allowance on trade receivables and contract assets. The Group estimates expected credit loss by assessing the loss that will be incurred given customer default based on past payment experience and adjusted by the cash flow expected from collateral or credit risk mitigation received where these are considered to be integral to the asset, and by assessing the probability of default considering information specific to the customer as well as pertaining to the country and economic environment in which the customer operates. The estimate also incorporates forward-looking data.

Impairment is assessed on an individual basis for trade receivables and contract assets meeting pre-determined criteria, including customers in financial difficulties, and contracts with risk mitigation arrangements or significant financing arrangements, amongst others. Apart from receivables and contract assets that have been assessed and provided for individually, allowances are estimated using provision matrices by management with reference to the customers' credit risk ratings and aging analysis of the remaining trade receivable and contract asset balances. Different provision matrices have been developed by the Group based on different customer groups which exhibit different risk characteristics.

If the financial condition of customers were to deteriorate or improve, or actual future economic performance is different to the Group's estimates, additional allowances or reversals may be required in future periods.

(c) Net realizable value of inventories

The net realizable value of inventories is the estimated selling price in the ordinary course of business, less the estimated costs of completion and the estimated costs necessary to make the sale, adjusted by the losses for obsolescence and redundancy. These estimates are based on the current market condition, economic lives of the Group's products, availability of components required to assemble the Group's products and the historical experience of inventory losses. They could change significantly as a result of industrial technology upgrades, competitor actions, development of the Events as described in note 4(j) or other changes in market condition. Management will reassess the estimations at the end of each reporting period.

(d) Impairment losses of other non-financial assets

The carrying amounts of other non-financial assets (including property, plant and equipment, right-of-use assets, goodwill and intangible assets and other long-term assets) are reviewed periodically in order to assess whether the recoverable amounts have declined below their carrying amounts. In order to determine the recoverable amount, the Group uses assumptions and develops expectations, which requires significant judgment. The Group uses all readily available information in determining an amount that is a reasonable approximation of recoverable amount, including estimates based on reasonable and supportable assumptions and projections of production volume, sales price, amount of operating costs, discount rate and growth rate.

(e) Income tax and deferred tax assets

The Group is subject to income taxes in numerous jurisdictions. Significant judgment is required in determining the Group's provision for income taxes. There are certain transactions and computations for which the ultimate tax determination is uncertain during the ordinary course of business. The Group recognizes liabilities in the relevant accounting period based on estimates of the probabilities of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will impact current and deferred tax liabilities and the taxation charge for the year.

Estimation uncertainty also arises from the recognition of deferred tax assets in respect of unused tax losses and credits and deductible temporary differences. Deferred tax assets are recognized to the extent that it is probable that future taxable profits will be available against which they can be utilized. Recognition primarily involves judgment regarding the future financial performance of each group entity, considering the reversal of existing taxable temporary differences and the periods in which tax losses can be utilized. Adverse changes to the operating environment or changes in the Group's organization structure

could result in a future write-down of the deferred tax assets recognized.

(f) Provision for warranties

As explained in note 28(b), the Group makes provision for assurance warranties, taking into account the Group's recent claim experience and anticipated claim rates for affected products. As the Group is continually upgrading its product designs and launching new models, it is possible that the recent claim experience is not indicative of future claims that it may receive in respect of affected product sales.

(g) Other provisions

The Group makes provisions for onerous contracts, outstanding litigations and claims based on project budgets, contract terms, available knowledge, legal advice and past experience. The Group recognizes provisions to the extent that it has a present legal or constructive obligation as a result of a past event; that it is probable that an outflow of resources will be required to settle the obligation; and that the amount can be reliably estimated.

The Group makes provisions for onerous contracts in respect of losses arising from non-cancelable procurement agreements when there is a change in the Group's procurement demands such that the Group may not proceed with committed purchase orders or use the goods concerned. Provisions are made considering the contract terms, the suppliers' losses resulting from the Group's termination of the agreements and the extent to which the goods under the committed purchase orders will no longer be used in the Group's production. In estimating the losses for redundancies, inventories held on hand and non-cancelable purchase orders are evaluated as a whole. Judgment is required in making the estimates and the ultimate outcome may be different. The Group regularly updates its production plan and procurement demands, estimates probable losses, and adjusts provisions accordingly.

(h) Depreciation and amortization

Property, plant and equipment and right-of-use assets are depreciated on a straight-line basis over the estimated useful lives, after considering the estimated residual value. Intangible assets with finite useful life are amortized on a straight-line basis over the estimated useful lives. Both the period and method of depreciation and amortization are reviewed annually. The depreciation and amortization expense for future periods is adjusted if there are significant changes, such as operational efficiency or changes in technologies, from previous estimates.

(i) Fair value of financial instruments

Some of the Group's financial instruments are measured at fair value. In estimating the fair value of a financial instrument, the Group uses market-observable data to the extent it is available. Where directly market-observable data are not available, the Group uses valuation techniques that include unobservable inputs to estimate the fair value of certain financial instruments. The Group regularly reviews significant unobservable inputs and relevant valuation results.

(j) Financial impact of the Entity List event

On May 16, 2019 and August 19, 2019 (dates in note 4(j) are in U.S. time), the U.S. Commerce Department's Bureau of Industry and Security (BIS) added Huawei Technologies Co., Ltd. and certain non-US affiliates to the Entity List. On August 17, 2020, BIS amended the Foreign-Produced Direct Product Rule by expanding the scope of control over foreign-produced items, and further added certain Huawei non-US affiliates to the Entity List. Upon being added to the Entity List, export, re-export or in-country transfer of items subject to the U.S. Export Administration Regulations (including hardware, software, technology, etc.) to the listed entities shall be subject to a BIS license requirement (collectively referred to as the Events).

As a result, supplies of relevant items to the Group and sales of certain products of the Group are adversely affected. The Group has been taking active measures to mitigate the impact of the Events. Management has applied significant judgments to estimate the impacts arising from the Events and relevant impairments and provisions have been recognized and adjusted continually based on the development of the Events.

5 Changes in accounting policies

The International Accounting Standards Board (IASB) has issued several amendments to IFRS Accounting

Standards that are effective from January 1, 2023, of which the following are relevant to the Group:

- Amendments to IAS 8, Accounting policies, changes in accounting estimates and errors: *Definition of Accounting Estimates*
- Amendments to IAS 12, Income tax: *International Tax Reform – Pillar Two Model Rules*
- Amendments to IAS 12, Income tax: *Deferred Tax related to Assets and Liabilities arising from a Single Transaction*
- Amendments to IAS 1, Presentation of financial statements, and IFRS Practice Statement 2, Making materiality judgements: *Disclosure of Accounting Policies*

The adoption of these amendments does not have a material effect on the Group's consolidated financial statements.

6 New standards and amendments issued but not yet effective for the year ended December 31, 2023

The IASB has issued a number of new standards and amendments which will affect the financial statements in subsequent accounting periods. They are not expected to have a significant impact on the Group's consolidated financial statements.

7 Segment information

Operating segments are determined based on the types of customers, products and services provided, as well as the Group's organization structure, management requirement and reporting system. The financial information of the different segments is regularly reviewed by the Group's most senior executive management for the purpose of resource allocation and performance assessment.

The Group divides its business into the following five operating segments:

- **ICT Infrastructure Business**

  The ICT infrastructure business mainly works on information distribution, interaction, transmission, processing, and storage, with a focus on two industries: connectivity and computing. The ICT infrastructure business provides global telecom carriers as well as government and enterprise customers with leading and innovative ICT products, solutions, and services. Our offerings include wireless networks, cloud core networks, data communication, optical, computing, data storage as well as services and software.

- **Consumer Business**

  The consumer business pursues a "1 + 8 + N" Seamless AI Life strategy. Driven by the HarmonyOS ecosystem, the consumer business focuses on five key scenarios: smart office, fitness & health, smart home, easy travel, and entertainment. It provides smartphones, tablets, personal computers, wearable devices, converged home devices, Huawei Zhixuan cars, as well as the applications and services that run on these devices for consumers and businesses.

- **Cloud Computing Business**

  The cloud computing business focuses on delivering Everything as a Service by making Huawei's ICT know-how, products, and solutions accessible in the form of cloud services. It provides customers, partners, and developers in different industries with innovative technologies, including artificial intelligence, data governance, media services, and software and hardware development tools.

- **Digital Power Business**

  The digital power business integrates digital and power electronics technologies, with a focus on clean power generation, mobility electrification, and green ICT power infrastructure. It provides low-carbon products and solutions covering smart PV and energy storage systems, smart charging networks, DriveONE (including e-mobility products for new energy vehicles), data center facilities, and site power facilities, to help build a greener industry and to promote sustainable development.

- **Intelligent Automotive Solution Business**

  The intelligent automotive solution business focuses on providing new components for intelligent connected electric vehicles, and aims to help the automotive industry go intelligent, connected, and electric. It provides products and solutions including intelligent driving, intelligent cockpits, intelligent vehicle control, and intelligent vehicle cloud services.

Segment revenue includes both sales to external customers and inter-segment sales.

(a) Revenue information in respect of business segments

(CNY million)	2023	2022
ICT Infrastructure	**361,997**	353,978
Consumer	**251,496**	214,463
Cloud Computing	**55,287**	45,342
Digital Power	**52,607**	50,806
Intelligent Automotive Solution	**4,737**	2,077
Other items	**8,624**	3,978
Elimination	**(30,574)**	(28,306)
Total	**704,174**	642,338

(b) Geographical revenue information

(CNY million)	2023	2022
China	**471,303**	403,999
Europe, the Middle East and Africa (EMEA)	**145,343**	149,206
Asia Pacific	**41,041**	48,048
Americas	**35,362**	31,898
Others	**11,125**	9,187
Total	**704,174**	642,338

8 Revenue

(CNY million)	2023	2022
Revenue from contracts with customers	**703,246**	641,420
Rental income	**928**	918
	704,174	642,338

Revenue from contracts with customers is analyzed by timing of revenue recognition as follows:

(CNY million)	2023	2022
Recognized at a point in time	**564,255**	513,594
Recognized over time	**138,991**	127,826
	703,246	641,420

Further disaggregation of revenue by business and geography is set out in note 7.

The amount of revenue recognized for the year ended December 31, 2023 from POBs satisfied (or partially satisfied) in previous years amounted to CNY1,789 million (2022: CNY2,612 million). The revenue was constrained in prior years as the relevant customers were high credit risk rated and the collectability of sales consideration was estimated to be low, or certain terms of relevant sale contracts were not agreed upon then.

Transaction price allocated to remaining performance obligations

As at December 31, 2023, the aggregated amount of transaction price allocated to the remaining performance obligations under the Group's existing customer contracts was CNY91,439 million (2022: CNY83,535 million). This amount mainly represents the remaining performance obligations under the Group's ICT infrastructure business contracts. The Group will recognize the revenue in future when control of the corresponding service or product is transferred to the customer as stipulated in note 3(q). 74% of the amount is expected to occur over the next year (2022: 76%), while the remaining portion is expected to occur in the years that follow. The amounts disclosed above do not include any estimated amounts of variable consideration that are constrained.

The Group does not disclose information about remaining performance obligations that have original expected durations of one year or less as permitted by IFRS 15.

Revenue is recognized when a performance obligation is satisfied in accordance with the accounting policies in note 3(q). The timing of payment from customers relative to revenue recognition generates either contract assets or trade receivables for payments received in arrears or contract liabilities for payments received in advance.

Contract assets and contract liabilities are presented in notes 20 and 26 respectively.

9 Other income, net

(CNY million)	Note	2023	2022
Fair value changes in financial instruments arising from disposals of subsidiaries and businesses	(i)	**55,853**	24,524
Government grants	(ii)	**7,327**	6,552
Commissions on individual income tax payments withheld		**614**	640
Gain on disposal of subsidiaries		**–**	59
Factoring expenses		**(1,308)**	(1,147)
Impairment of property, plant and equipment, intangible assets, goodwill, right-of-use assets, joint ventures and associates		**(62)**	(229)
Donations		**(275)**	(187)
Net loss on disposal of property, plant and equipment, intangible assets and right-of-use assets		**(226)**	(80)
Others, net		**758**	1,438
		62,681	31,570

(i) The Group disposed of Honor business and certain subsidiaries engaged in manufacturing and sales of server products in prior years. According to the contract terms, the Group would receive the consideration in installments and there exists uncertainty over the ultimate consideration the Group is entitled to. Therefore, the financial instruments arising from the disposals were both measured at fair value through profit or loss. Cash receipts on the financial instruments are presented within investing cash flows.

During the year ended December 31, 2023, the Group and the buyer of the Honor business entered into a supplementary agreement and the Group's contractual rights and obligations pertaining to the sale were completely executed and discharged. The financial instrument arising from the disposal of server product manufacturing and sales subsidiaries is included in other liabilities as at December 31, 2023.

(ii) During the year ended December 31, 2023, government grants recognized as other income, net included unconditional grants of CNY744 million (2022: CNY976 million), and conditional grants of CNY6,583 million (2022: CNY5,576 million) which are generally related to research and development projects.

10 Personnel expenses

(CNY million)	2023	2022
Salaries, bonuses and allowances	**156,446**	153,022
Defined benefit plans	**6,205**	6,137
Defined contribution plans and others	**19,194**	17,772
	181,845	176,931

Defined contribution plans

The Group contributes to defined contribution retirement plans for eligible employees. The plans are managed either by the governments in the countries where the employees are employed, or by independent trustees. Contribution levels are determined by the relevant laws and regulations concerned.

11 Finance income and expenses

(CNY million)	Note	2023	2022
Interest income on financial assets at amortized cost			
– deposits and wealth management products		**6,490**	3,085
– other financial assets		**717**	413
Interest income on financial assets at FVOCI		**393**	185
Interest income on lease receivables		**14**	21
Net gains on financial instruments mandatorily at FVPL	(i)	**–**	5,548
Dividend income and others		**1,264**	807
Finance income		**8,878**	10,059
Interest expense on loans and borrowings		**(11,679)**	(7,596)
Less: interest expense capitalized	(ii)	**204**	124
Interest cost on employee benefit obligations		**(691)**	(638)
Interest expense on lease liabilities	29(a)(ii)	**(479)**	(417)
Other interest expense		**(321)**	(202)
Net losses on financial instruments mandatorily at FVPL	(i)	**(1,811)**	**–**
Net losses on disposal of financial assets at FVOCI	13(b)	**(261)**	–
Net foreign exchange loss	(iii)	**(474)**	(277)
(Impairment loss)/reversal of impairment loss		**(3)**	4
Bank charges		**(22)**	(39)
Finance expenses		**(15,537)**	(9,041)
Net finance (expenses)/income		**(6,659)**	1,018

(i) The net gains or losses mainly include fair value changes in investment funds, equity securities and beneficiary rights as well as compound financial instruments mandatorily at FVPL as disclosed in note 17.

(ii) Interest expenses capitalized represent interest costs on specific loans for property construction purpose.

(iii) For the year ended December 31, 2023, net foreign exchange loss included net fair value gain of CNY2,800 million on foreign exchange forward contracts that were not designated as hedging instruments (2022: net fair value loss of CNY557 million).

12 Income tax in the summary consolidated statement of profit or loss and other comprehensive income

Charge for the year

(CNY million)	2023	2022
Current tax		
Provision for the year	**10,314**	9,487
Under provision in respect of prior years	**1,597**	142
	11,911	9,629
Deferred tax		
Origination and reversal of temporary differences	**(1,163)**	(1,285)
Effect of changes in tax rates on opening deferred tax balances	**(102)**	40
	(1,265)	(1,245)
	10,646	8,384

13 Other comprehensive income

(a) Tax effects relating to each component of other comprehensive income

(CNY million)	2023			2022		
	Before-tax amount	**Tax (expense)/ benefit**	**Net-of-tax amount**	Before-tax amount	Tax (expense)/ benefit	Net-of-tax amount
Re-measurement of defined benefit obligations						
– The Group	**151**	**(18)**	**133**	71	(6)	65
Net change in the fair value and impairment loss of financial assets measured at FVOCI						
Net change in the fair value of equity investments						
– The Group	**1,644**	**(294)**	**1,350**	(1,521)	352	(1,169)
Net change in the fair value and impairment loss of non-equity financial assets						
– The Group	**176**	**(4)**	**172**	(266)	16	(250)
	1,820	**(298)**	**1,522**	(1,787)	368	(1,419)
Translation differences on foreign operations						
– The Group	**1,202**	**23**	**1,225**	3,500	14	3,514
– Share of associates and joint ventures	**1**	**–**	**1**	(1)	–	(1)
	1,203	**23**	**1,226**	3,499	14	3,513
	3,174	**(293)**	**2,881**	1,783	376	2,159

(b) Components of other comprehensive income, including reclassification adjustments

(CNY million)	**2023**	2022
Net change in the fair value and impairment loss of financial assets measured at FVOCI		
Changes in fair value recognized during the year	**1,557**	(1,791)
Reclassification adjustments for amounts transferred to profit or loss		
– Loss on derecognition (note 11)	**261**	–
Loss allowances recognized	**2**	4
Net deferred tax (debited)/credited to other comprehensive income	**(298)**	368
Net movement in the fair value reserve during the year	**1,522**	(1,419)
Translation differences on foreign operations		
Recognized during the year		
– Translation differences	**1,357**	3,592
– Effective portion of changes in fair value of hedging instruments	**(158)**	(93)
Reclassification adjustments for amounts transferred to profit or loss		
– Liquidation or disposal of subsidiaries	**4**	–
Net deferred tax credited to other comprehensive income	**23**	14
Net movement in the translation reserve during the year	**1,226**	3,513

14 Property, plant and equipment

(CNY million)	Freehold land	Buildings	Machinery	Electronic and other equipment	Motor vehicles	Construction in progress	Investment property	Decoration and leasehold improvements	Total
Cost:									
At January 1, 2022	415	37,306	48,821	91,856	589	18,998	429	31,447	229,861
Exchange adjustments	(10)	(8)	(6)	539	3	230	50	97	895
Additions	10	294	1,765	3,448	56	29,520	453	122	35,668
Transfer from construction in progress	–	4,374	6,971	11,411	1	(26,301)	–	3,544	–
Transfer to investment property	–	(340)	(77)	–	–	–	517	(31)	69
Disposals	–	–	(450)	(1,971)	(35)	(30)	(19)	(328)	(2,833)
Reclassified as assets held for sale	–	–	(9)	(1)	–	–	–	(8)	(18)
Hyperinflation adjustments	–	–	4	266	13	5	–	136	424
At December 31, 2022	415	41,626	57,019	105,548	627	22,422	1,430	34,979	264,066
At January 1, 2023	**415**	**41,626**	**57,019**	**105,548**	**627**	**22,422**	**1,430**	**34,979**	**264,066**
Exchange adjustments	**(3)**	**(111)**	**(17)**	**(73)**	**(20)**	**54**	**(58)**	**(178)**	**(406)**
Additions	**25**	**55**	**2,590**	**3,627**	**68**	**40,560**	**26**	**55**	**47,006**
Transfer from investment property	**51**	**212**	**–**	**–**	**–**	**–**	**(263)**	**–**	**–**
Transfer from construction in progress	**–**	**2,790**	**7,608**	**8,274**	**2**	**(21,609)**	**–**	**2,935**	**–**
Transfer to inventory	**–**	**(658)**	**(201)**	**(1)**	**–**	**–**	**–**	**(454)**	**(1,314)**
Disposals	**–**	**–**	**(1,098)**	**(6,753)**	**(65)**	**(13)**	**(5)**	**(452)**	**(8,386)**
Reclassified as assets held for sale	**–**	**(4)**	**(70)**	**(15)**	**–**	**–**	**–**	**(6)**	**(95)**
Hyperinflation adjustments	**–**	**–**	**3**	**302**	**31**	**10**	**–**	**88**	**434**
At December 31, 2023	**488**	**43,910**	**65,834**	**110,909**	**643**	**41,424**	**1,130**	**36,967**	**301,305**
Accumulated depreciation and impairment:									
At January 1, 2022	–	6,353	19,983	61,045	417	6	114	17,809	105,727
Exchange adjustments	–	18	(1)	359	2	(1)	(2)	72	447
Depreciation charge for the year	–	1,244	5,472	12,104	53	–	93	3,686	22,652
Transfer to investment property	–	(6)	(1)	–	–	–	14	–	7
Impairment loss	–	–	33	129	–	75	–	4	241
Disposals	–	–	(410)	(1,631)	(32)	(1)	(10)	(320)	(2,404)
Reclassified as assets held for sale	–	–	(1)	(1)	–	–	–	(2)	(4)
Hyperinflation adjustments	–	–	3	232	8	–	–	133	376
At December 31, 2022	–	7,609	25,078	72,237	448	79	209	21,382	127,042
At January 1, 2023	**–**	**7,609**	**25,078**	**72,237**	**448**	**79**	**209**	**21,382**	**127,042**
Exchange adjustments	**–**	**(10)**	**6**	**(21)**	**(10)**	**6**	**(3)**	**(119)**	**(151)**
Depreciation charge for the year	**–**	**1,388**	**6,351**	**13,284**	**54**	**–**	**53**	**3,642**	**24,772**
Transfer from investment property	**–**	**10**	**–**	**–**	**–**	**–**	**(10)**	**–**	**–**
Transfer from construction in progress	**–**	**–**	**–**	**2**	**–**	**(2)**	**–**	**–**	**–**
Transfer to inventory	**–**	**(102)**	**(94)**	**(1)**	**–**	**–**	**–**	**(387)**	**(584)**
Impairment loss	**–**	**–**	**35**	**6**	**–**	**2**	**–**	**–**	**43**
Disposals	**–**	**–**	**(493)**	**(5,628)**	**(62)**	**(1)**	**–**	**(439)**	**(6,623)**
Reclassified as assets held for sale	**–**	**–**	**(10)**	**(7)**	**–**	**–**	**–**	**(2)**	**(19)**
Hyperinflation adjustments	**–**	**–**	**2**	**250**	**23**	**–**	**–**	**55**	**330**
At December 31, 2023	**–**	**8,895**	**30,875**	**80,122**	**453**	**84**	**249**	**24,132**	**144,810**
Carrying amount:									
At December 31, 2023	**488**	**35,015**	**34,959**	**30,787**	**190**	**41,340**	**881**	**12,835**	**156,495**
At December 31, 2022	415	34,017	31,941	33,311	179	22,343	1,221	13,597	137,024

Based on the use of related assets, the depreciation charge for the year is allocated to cost of sales, research and development expenses, and selling and administrative expenses. Impairment losses are charged to cost of sales and other income, net in the summary consolidated statement of profit or loss and other comprehensive income.

As at December 31, 2023 and 2022, the Group did not hold any property, plant and equipment as collateral for liabilities or contingent liabilities.

15 Goodwill and intangible assets

(CNY million)	Goodwill	Software	Patents and royalties (note(a))	Trademark and others	Total
Cost:					
At January 1, 2022	4,114	2,496	13,526	3,231	23,367
Exchange adjustments	320	10	20	26	376
Additions	–	396	1,048	176	1,620
Disposals	(10)	(412)	(862)	(1,088)	(2,372)
At December 31, 2022	4,424	2,490	13,732	2,345	22,991
At January 1, 2023	**4,424**	**2,490**	**13,732**	**2,345**	**22,991**
Exchange adjustments	**72**	**–**	**8**	**6**	**86**
Additions	**–**	**613**	**1,084**	**549**	**2,246**
Disposals	**–**	**(477)**	**(300)**	**(462)**	**(1,239)**
At December 31, 2023	**4,496**	**2,626**	**14,524**	**2,438**	**24,084**
Amortization and impairment:					
At January 1, 2022	3,784	2,048	7,926	1,505	15,263
Exchange adjustments	317	9	21	16	363
Amortization for the year	–	240	889	466	1,595
Impairment loss	16	–	–	4	20
Disposals	(11)	(362)	(839)	(1,086)	(2,298)
At December 31, 2022	4,106	1,935	7,997	905	14,943
At January 1, 2023	**4,106**	**1,935**	**7,997**	**905**	**14,943**
Exchange adjustments	**70**	**(1)**	**6**	**5**	**80**
Amortization for the year	**–**	**387**	**862**	**419**	**1,668**
Disposals	**–**	**(477)**	**(207)**	**(460)**	**(1,144)**
At December 31, 2023	**4,176**	**1,844**	**8,658**	**869**	**15,547**
Carrying amount:					
At December 31, 2023	**320**	**782**	**5,866**	**1,569**	**8,537**
At December 31, 2022	318	555	5,735	1,440	8,048

(a) As at December 31, carrying amounts of patents and royalties are analyzed as follows:

(CNY million)	2023	2022
Patents	**5,038**	4,507
Royalties	**828**	1,228
	5,866	5,735

(b) Based on the use of the related assets, the amortization charge for the year is allocated to cost of sales, research and development expenses, and selling and administrative expenses. Impairment losses are charged to cost of sales and other income, net in the summary consolidated statement of profit or loss and other comprehensive income.

(c) As at December 31, 2023 and 2022, all of the carrying amount of goodwill was allocated across multiple cash-generating units and the amount so allocated to each unit was not significant.

(d) As at December 31, 2023 and 2022, the Group did not hold any intangible assets whose title is restricted or pledged as security for liabilities.

16 Interests in associates and joint ventures

(CNY million)	2023	2022
Associates	**6,615**	6,414
Joint ventures	**721**	695
	7,336	7,109

Associates and joint ventures are accounted for using the equity method. None of the associates and joint ventures is individually significant.

Aggregate carrying amounts and summarized financial information of associates and joint ventures are as follows:

(CNY million)	Associates		Joint ventures	
	2023	2022	2023	2022
Aggregate carrying amount	**6,615**	6,414	**721**	695
Aggregate amount of the Group's share of associates' and joint ventures'				
(Loss)/profit for the year	**(106)**	504	**(40)**	208
Other comprehensive income	**–**	(1)	**–**	–
Total comprehensive income	**(106)**	503	**(40)**	208

17 Other investments and derivatives

(CNY million)	Note	2023	2022
Financial assets at amortized cost			
Fixed deposits		**111,215**	72,183
Debt securities	(i)	**3,575**	60
		114,790	72,243
Loss allowances		**(7)**	(3)
		114,783	72,240
Financial assets mandatorily at FVPL			
Investment funds	(ii)	**165,847**	153,254
Equity securities and beneficiary rights	(iii)	**136,552**	62,495
Compound financial instruments	(iv)	**3,746**	3,946
Derivatives	(v)	**482**	305
		306,627	220,000
Financial assets at FVOCI			
Debt securities	(i)	**5,950**	9,077
Equity securities	(iii)	**10,046**	8,226
		15,996	17,303
		437,406	309,543
Non-current portion		**154,510**	83,055
Current portion		**282,896**	226,488
		437,406	309,543

(i) Debt securities comprise investments in fixed rate bonds, floating rate notes, certificates of deposit, commercial paper, etc. Debt securities are measured at amortized cost where the Group intends to hold them to collect contractual cash flows. Other debt securities are classified as FVOCI since they are held to collect and for sale, and also give rise to cash flows which are solely principal and interest. The loss allowances on debt securities at FVOCI amounted to CNY2 million as at December 31, 2023 (2022: CNY3 million).

(ii) Investment funds comprise structured deposits, bond funds, money market funds and variable net asset value wealth management products. Investment funds are measured at FVPL where the Group intends to sell them or where the investments do not give rise to cash flows which are solely principal and interest.

(iii) Equity securities and beneficiary rights represent equity investments and interests in equity investment arrangements. These investments are designated at FVOCI where they are considered strategic to the Group and meet the definition of equity from the issuers' perspective, or measured at FVPL. Dividend income received on equity investments at FVOCI amounted to CNY61 million (2022: CNY80 million) for the year ended December 31, 2023.

Certain equity investments at FVOCI were disposed of during the year ended December 31, 2023, and the corresponding cumulative gain in fair value reserve of CNY3 million was transferred to retained earnings upon disposal of these investments (2022: CNY35 million).

(iv) Compound financial instruments comprise equity instruments with redemption options and convertible notes which are classified at FVPL.

(v) Derivatives mainly comprise foreign exchange forward contracts.

(vi) As at December 31, 2023 and 2022, the Group did not hold any investments pledged as collateral for liabilities or contingent liabilities.

18 Deferred tax assets/(liabilities)

(a) Components of recognized deferred tax assets/(liabilities)

(CNY million)	2023	2022
Accruals, defined benefit obligations, refund liabilities and unperformed obligations	**5,373**	5,708
Fair value changes of financial instruments	**(1,953)**	(1,618)
Depreciation and impairment of property, plant and equipment	**(3,856)**	(4,301)
Unrealized profit	**4,556**	4,736
Tax losses	**4,900**	3,654
Undistributed profits of subsidiaries	**(1,237)**	(1,129)
Write-down of inventories	**656**	652
Provision for loss allowances	**429**	376
Others	**155**	(122)
Total	**9,023**	7,956

Reconciliation to the summary consolidated statement of financial position:

(CNY million)	2023	2022
Net deferred tax assets	**12,456**	11,760
Net deferred tax liabilities	**(3,433)**	(3,804)
	9,023	7,956

(b) Deferred tax assets not recognized

Deferred tax assets were not recognized on certain unused tax losses, deductible temporary differences and unused tax credits in accordance with the accounting policy set out in note 3(o).

As at December 31, 2023, deferred tax assets had not been recognized in respect of unused tax losses amounting to CNY313,696 million (2022: CNY207,383 million) and deductible temporary differences amounting to CNY188,276 million (2022: CNY185,272 million); additionally, unused tax credits relating to overseas withholding income tax and corporate income tax incurred as well as certain research and development expenditure totaling CNY2,853 million (2022: CNY4,408 million) had not been recognized as deferred tax assets.

19 Inventories and other contract costs

(CNY million)	2023	2022
Inventories		
Raw materials	**73,422**	87,650
Manufacturing work in progress	**34,534**	28,751
Finished goods and consumables	**28,631**	29,036
Dispatched goods and contract work in progress	**12,660**	14,106
Other inventories	**5,042**	3,374
	154,289	162,917
Other contract costs	**269**	365
	154,558	163,282

As at December 31, 2023 and 2022, the Group did not hold any inventories pledged as collateral for liabilities or contingent liabilities.

(a) Amount of inventories recognized as an expense and included in profit or loss:

(CNY million)	2023	2022
Carrying amount of inventories sold	**282,697**	271,396
Write-down of inventories	**583**	6,196
	283,280	277,592

The write-down is included in cost of sales.

(b) Contract costs

The Group's contract costs represent contract fulfilment costs incurred to deliver services to customers, which will be charged to cost of sales when the corresponding performance obligations are satisfied.

No provision for impairment was required on contract costs as at December 31, 2023 or 2022.

20 Contract assets

(CNY million)	2023	2022
Gross carrying amount	**54,189**	52,821
Loss allowances (note 21(b))	**(303)**	(294)
	53,886	52,527
Non-current portion	**1,340**	1,025
Current portion	**52,546**	51,502
	53,886	52,527

Contract assets relate to the Group's rights to consideration for performance obligations that have been satisfied but not billed, primarily from ICT infrastructure business contracts. Contract assets are transferred to receivables when the right to payment becomes unconditional, other than the passage of time. This usually occurs when the Group issues an invoice to the customer in accordance with the billing milestones agreed in the contract, which are generally upon passing of the product acceptance tests.

Significant changes in the gross balances of contract assets during the year are as follows:

(CNY million)	2023	2022
At January 1	**52,821**	52,810
Addition during the year	**50,267**	47,836
Transfers to receivables or reversal during the year	**(48,768)**	(48,640)
Exchange adjustments	**(131)**	815
At December 31	**54,189**	52,821

21 Trade and bills receivable

(CNY million)	Note	2023	2022
Trade receivables			
Trade receivables from third parties	(i)	**97,152**	87,143
Trade receivables from related parties	31	**72**	34
		97,224	87,177
Bills receivable			
Bank and finance company acceptance bills		**5,207**	809
Commercial acceptance bills		**5,777**	1,647
Letters of credit		**856**	1,244
	(ii)	**11,840**	3,700
		109,064	90,877
Non-current portion		**7,014**	3,073
Current portion		**102,050**	87,804
		109,064	90,877

(i) As at December 31, 2023, the Group's trade receivables that may be sold through reverse factoring arrangements amounted to CNY6,885 million (2022: CNY7,112 million). These trade receivables are managed in a business model whose objective is achieved by both collection and sale, and are therefore measured at FVOCI.

(ii) The Group's bills receivable are due within twelve months from issuance date.

(a) Aging analysis

At the end of the reporting period, the aging analysis of trade receivables is as follows:

(CNY million)	2023	2022
Not past due	**73,604**	65,195
Less than 90 days past due	**15,767**	16,108
90 days to 1 year past due	**8,101**	6,876
1 year and above past due	**3,402**	2,170
	100,874	90,349
Loss allowances	**(3,650)**	(3,172)
	97,224	87,177

Trade receivables are generally due within 30 days from the date of billing.

(b) Loss allowances of trade receivables and contract assets

Loss allowances in respect of trade receivables and contract assets are recorded using an allowance account unless the Group is satisfied that there is no reasonable expectation of further recoveries in which case the receivables are written off (see note 3(e)(i)).

The movement in loss allowances in respect of trade receivables and contract assets during the year is as follows:

(CNY million)	Note	2023	2022
At January 1		**3,497**	3,148
Loss allowances recognized		**774**	297
Uncollectible amounts written-off		**(92)**	(472)
Collection of previously written-off debtors		**39**	154
Disposal of a subsidiary		**–**	(1)
Exchange adjustments		**(231)**	371
At December 31		**3,987**	3,497
Representing loss allowances			
– on trade receivables		**3,650**	3,172
– on contract assets	20	**303**	294
– included in OCI on trade receivables at FVOCI		**34**	31
Total		**3,987**	3,497

Loss allowances recognized on trade receivables and contract assets are included in selling and administrative expenses.

During the year ended December 31, 2023, the loss allowances of trade receivables and contract assets increased mainly due to additional allowance recognized on the long-aged receivables due from certain customers in Asia Pacific.

(c) Transferred trade receivables not derecognized in their entirety

As at December 31, 2023, the Group's undue trade receivables with the face value of CNY8 million (2022: CNY9 million) have been transferred to banks and the Group received the corresponding remittance of CNY8 million (2022: CNY9 million). As these transactions are with recourse, the Group therefore has retained substantially all the risks and rewards and continues to recognize these trade receivables and the relevant financing as loans and borrowings (note 24).

As at December 31, 2023, the Group's trade receivables with the carrying amount of CNY2,760 million (2022: CNY3,256 million) have been transferred to banks. These trade receivables are covered by insurance policies issued by third party credit insurance agencies with the transferees as the loss payees. In these transactions, the Group retains risk not covered by the insurance, therefore the Group has neither transferred nor retained substantially all the risks and rewards in relation to the trade receivables and the Group is considered to have retained control of these trade receivables as the transferees have no practical ability to sell these trade receivables without the Group's consent. As such, the Group continues to recognize the transferred trade receivables of CNY527 million (2022: CNY567 million) and associated liabilities of CNY564 million (2022: CNY610 million) to the extent of its continuing involvement. The associated liabilities are included in other liabilities. As at December 31, 2023, loss allowances of CNY409 million (2022: CNY405 million) were made on these transferred receivables.

(d) Collateral

As at December 31, 2023 and 2022, except as disclosed in note 21(c), the Group did not hold any other trade and bills receivable pledged as collateral for liabilities or contingent liabilities.

22 Other assets

(CNY million)	Note	2023	2022
Advance payments to suppliers		**51,985**	47,386
Prepayment for acquisition of long-term assets		**7,971**	8,881
Tax receivables on unbilled deliveries	(i)	**5,079**	4,963
Income tax related assets		**1,639**	1,488
Other tax related assets		**16,322**	13,255
Pledged and restricted deposits with banks		**1,961**	1,608
Other third party receivables		**17,190**	33,968
Other long-term deferred assets		**2,938**	1,131
Related party receivables	31	**278**	386
Assets held for sale		**191**	13
		105,554	113,079
Non-current portion		**17,413**	14,628
Current portion		**88,141**	98,451
		105,554	113,079

(i) Under certain tax regulations, value added tax (VAT) and other surcharges are payable at the earlier of delivery of goods and services or issuance of VAT invoices. These balances represent VAT and surcharge receivable from customers on unbilled deliveries and will be reclassified to trade receivables upon billing.

23 Cash and cash equivalents

(CNY million)	2023	2022
Cash on hand	**5**	7
Deposits with banks and other financial institutions	**171,416**	138,999
Highly liquid short-term investments	**21,023**	8,131
Deposits with third party merchants	**459**	132
	192,903	147,269

Short-term investments included in cash and cash equivalents are highly liquid, readily convertible into known amounts of cash and subject to an insignificant risk of changes in value. As at December 31, 2023, these short-term investments comprised reverse repurchase agreements with maturities of less than three months of CNY19,500 million (2022: CNY500 million), money market funds of CNY1,024 million (2022: CNY7,631 million), and fixed income structured notes of CNY500 million (2022: nil). Money market funds comprise investments in short-term debt securities which have constant or low volatility net asset values and are measured at FVPL. The fixed income structured notes are securities issued by Chinese security companies with guaranteed principal and fixed income.

As at December 31, 2023, cash and cash equivalents of CNY1,116 million (2022: CNY836 million) were held in countries where exchange controls or other legal restrictions were in force.

As at December 31, 2023, the Group held cash equivalents of CNY6,772 million (2022: CNY8,312 million) in multicurrency pooling arrangements to meet its day-to-day cash requirements. The facilities allow participating subsidiaries to place deposits and borrow funds from the counterparty banks in any freely convertible currency subject to the overall balance on the pools being positive.

As at December 31, 2023 and 2022, the Group did not hold any cash and cash equivalents pledged as collateral for liabilities or contingent liabilities.

24 Loans and borrowings

Contractual terms of the Group's loans and borrowings are summarized below.

(CNY million)	2023	2022
Short-term loans and borrowings:		
– Unsecured	**432**	228
Long-term loans and borrowings:		
– Intra-group guaranteed	**23**	205
– Trade receivables financing (note 21(c))	**8**	9
– Unsecured	**236,949**	140,484
– Corporate bonds	**71,002**	56,218
	307,982	196,916
	308,414	197,144
Non-current portion	**291,688**	183,183
Current portion	**16,726**	13,961
	308,414	197,144

Intra-group guaranteed loans are external borrowings which have been raised by one group entity but contractual payments of principal and interest are guaranteed by another group entity.

Terms and repayment schedule

A summary of the main terms and conditions of outstanding loans and borrowings are as follows:

At December 31, 2023

(CNY million)		Interest rate per annum	Total	1 year or less	1 to 5 years	Over 5 years
Intra-group guaranteed bank loans:						
CNY	variable	**3.96%**	**23**	**23**	**–**	**–**
Trade receivables financing:						
United States Dollar (USD)	variable	**9.06%**	**8**	**2**	**6**	**–**
Unsecured bank loans:						
CNY	variable	**2.80% ~ 3.96%**	**191,186**	**404**	**38,662**	**152,120**
Euro (EUR)	variable	**4.73% ~ 4.94%**	**8,051**	**20**	**4,693**	**3,338**
EUR	fixed	**5.07%**	**1**	**1**	**–**	**–**
Hong Kong Dollar (HKD)	variable	**6.00% ~ 6.94%**	**37,711**	**6,518**	**17,668**	**13,525**
Saudi Arabian Riyal (SAR)	variable	**2.89% ~ 8.35%**	**179**	**179**	**–**	**–**
Bahrain Dinar (BHD)	variable	**5.80%**	**12**	**12**	**–**	**–**
Nigerian Naira (NGN)	fixed	**19.00%**	**201**	**201**	**–**	**–**
Pakistani Rupee	fixed	**17.12%**	**37**	**37**	**–**	**–**
USD	variable	**6.16%**	**3**	**3**	**–**	**–**
			237,381	**7,375**	**61,023**	**168,983**
Corporate bonds:						
CNY	fixed	**2.87% ~ 3.65%**	**46,094**	**9,152**	**36,942**	**–**
USD	fixed	**4.00% ~ 4.13%**	**24,908**	**174**	**24,734**	**–**
			71,002	**9,326**	**61,676**	**–**
			308,414	**16,726**	**122,705**	**168,983**

At December 31, 2022

(CNY million)		Interest rate per annum	Total	1 year or less	1 to 5 years	Over 5 years
Intra-group guaranteed bank loans:						
CNY	variable	4.26%	205	182	23	–
Trade receivables financing:						
USD	variable	4.92%	9	2	6	1
Unsecured bank loans:						
CNY	variable	2.95% ~ 4.31%	102,764	135	21,388	81,241
EUR	variable	2.36% ~ 3.05%	5,266	–	4,291	975
HKD	variable	5.26% ~ 6.51%	22,039	–	17,663	4,376
SAR	variable	1.80% ~ 4.75%	43	43	–	–
BHD	variable	5.80%	104	104	–	–
NGN	fixed	19.00%	75	75	–	–
EUR	fixed	1.75%	6	6	–	–
USD	variable	5.62% ~ 5.68%	10,415	10,415	–	–
			140,712	10,778	43,342	86,592
Corporate bonds:						
CNY	fixed	2.87% ~ 3.65%	31,954	2,999	28,955	–
USD	fixed	4.00% ~ 4.13%	24,264	–	24,264	–
			56,218	2,999	53,219	–
			197,144	13,961	96,590	86,593

Certain of the Group's banking facilities are subject to compliance with covenants relating to financial ratios. In the event of breach, the drawn down facilities would become payable on demand. The Group regularly monitors its compliance with these covenants. As at December 31, 2023 and 2022, no covenants had been breached.

Corporate bonds

The Group's CNY and USD corporate bonds were issued by the Company and its wholly-owned subsidiaries respectively. Main terms of the outstanding corporate bonds are as follows:

Corporate bond	Issue date	Principal amount million	Interest rate per annum	Term
USD bond	May 19, 2015	1,000	4.125%	10 years
USD bond	May 6, 2016	2,000	4.125%	10 years
USD bond	February 21, 2017	500	4.000%	10 years
CNY medium-term note	March 6, 2020	2,000	3.240%	5 years
CNY medium-term note	March 23, 2020	2,000	3.380%	5 years
CNY medium-term note	April 24, 2020	2,000	3.090%	5 years
CNY medium-term note	January 29, 2021	4,000	3.580%	3 years
CNY medium-term note	March 5, 2021	4,000	3.650%	3 years
CNY medium-term note	January 10, 2022	4,000	2.960%	3 years
CNY medium-term note	January 24, 2022	3,000	3.260%	5 years
CNY medium-term note	February 28, 2022	4,000	2.990%	3 years
CNY medium-term note	July 22, 2022	4,000	2.870%	3 years
CNY medium-term note	January 16, 2023	3,000	3.450%	5 years
CNY medium-term note	February 10, 2023	3,000	3.400%	5 years
CNY medium-term note	March 6, 2023	3,000	3.450%	5 years
CNY medium-term note	April 17, 2023	4,000	3.050%	3 years
CNY medium-term note	August 28, 2023	3,000	2.980%	5 years

USD bonds are fully guaranteed by the Company.

Reconciliation of movements of major liabilities to cash flows arising from financing activities

Year ended December 31, 2023

Related liabilities (CNY million)	Other loans and borrowings	Corporate bonds	Long-term assets installments	Lease liabilities
Balance at January 1, 2023	**140,926**	**56,218**	**1,647**	**10,571**
Proceeds from borrowings	**140,128**	**24,950**	**–**	**–**
Repayment of borrowings	**(44,911)**	**(12,000)**	**–**	**–**
Long-term assets acquired	**–**	**–**	**283**	**–**
Installment payments	**–**	**–**	**(722)**	**–**
New leases	**–**	**–**	**–**	**4,256**
Payment of lease liabilities	**–**	**–**	**–**	**(3,556)**
Interest incurred during the year	**8,378**	**2,491**	**–**	**479**
Interest paid	**(8,568)**	**(2,158)**	**–**	**(344)**
Amortization of capitalized interests and transaction costs	**120**	**62**	**29**	**–**
Non-cash transactions (note)	**(750)**	**–**	**–**	**–**
Termination of leases	**–**	**–**	**–**	**(5)**
Exchange adjustments	**2,089**	**1,439**	**67**	**(566)**
Balance at December 31, 2023	**237,412**	**71,002**	**1,304**	**10,835**

Note: Under certain financing arrangements, the Group's entitlement to consideration from customer contracts is transferred for cash to financial institutions before the Group obtains unconditional rights, giving rise to financial liabilities included in loans and borrowings. The Group derecognizes the relevant loans and borrowings under these arrangements upon becoming unconditionally entitled to the relevant contract consideration.

25 Trade and bills payable

(CNY million)	Note	2023	2022
Trade payables			
Related party trade payables	31	**875**	1,054
Third party trade payables		**85,487**	84,218
		86,362	85,272
Bills payable			
Bank acceptance bills		**1,390**	1,745
Letters of credit payable		**3,093**	5,087
		4,483	6,832
		90,845	92,104

26 Contract liabilities

Significant changes in contract liabilities during the year are as follows:

(CNY million)	2023	2022
At January 1	**87,575**	78,149
Revenue recognized that was included in the contract liability balance at the beginning of the year	**(57,716)**	(62,204)
Increases due to cash received or billing for unperformed obligations	**65,307**	69,848
Exchange adjustments	**(65)**	1,782
At December 31	**95,101**	87,575

The balance of contract liabilities represents consideration received or billing in advance of performance, after offsetting the balance of contract assets under the same contract. Contract liabilities mainly include deferred warranty service income, vouchers, and advance receipts or billing related to sales of goods or services from ICT infrastructure business, consumer business and cloud computing business.

27 Other liabilities

(CNY million)	Note	2023	2022
Accrued expenses		**25,093**	23,480
Refund liabilities	(i)	**17,980**	14,883
Other taxes payable		**15,637**	14,112
Due in relation to property, plant and equipment		**15,545**	11,430
Due in relation to intangible assets		**1,845**	2,051
Derivatives	(ii)/17(v)	**304**	173
Others		**45,280**	50,905
		121,684	117,034
Non-current portion		**2,016**	2,608
Current portion		**119,668**	114,426
		121,684	117,034

(i) Refund liabilities mainly comprise the rebates and other sales-based incentives to customers.

(ii) As at December 31, 2023, the carrying value of the foreign exchange derivatives held as hedging instruments amounted to CNY5 million (2022: CNY30 million).

28 Provisions

(CNY million)	Note	2023	2022
Warranties	(b)	**6,975**	4,793
Onerous contracts with customers		**1,326**	719
Onerous contracts with suppliers	(c)	**6,635**	8,309
Others	(d)	**5,233**	2,761
		20,169	16,582

(a) Movement in provisions during the year is shown as below:

(CNY million)	Warranties	Onerous contracts with customers	Onerous contracts with suppliers	Others	Total
At January 1, 2023	4,793	719	8,309	2,761	16,582
Provisions made/(reversals)	6,867	881	(431)	2,430	9,747
Provisions utilized	(4,770)	(277)	(1,243)	(214)	(6,504)
Exchange adjustments	85	3	–	256	344
At December 31, 2023	6,975	1,326	6,635	5,233	20,169

(b) Warranties

The provision for warranties is determined based on estimates made from historical and forecast warranty data associated with similar products, the amounts of products under warranty at the end of the reporting period and their corresponding remaining warranty periods.

(c) Provision for onerous contracts with suppliers

The Group has entered into certain non-cancelable procurement agreements in its normal course of business. As a result of the Events disclosed in note 4(j) and changes in market demand for products, certain items under these procurement agreements may not be capable of being used in production and provision has been made for the estimated losses arising from fulfilling, amending or terminating relevant agreements in accordance with the accounting policy set out in note 3(p). The provision is charged to cost of sales.

(d) Others

Others are mainly provisions for outstanding claims, cases and disputes.

29 Leases

(a) As a lessee

The Group leases office premises, staff apartments, warehouses, production equipment and motor vehicles in its normal course of business. These leases typically run for an initial period of one to ten years. Some property leases contain extension options after the contract period and only a limited number of leases comprise variable payments. The Group also holds land use rights in the PRC, which are recognized as right-of-use assets at the date the Group became entitled to the rights.

Information about leases for which the Group is a lessee is presented below.

(i) Right-of-use assets

(CNY million)	Land use rights	Buildings	Motor vehicles and others	Total
Cost:				
At January 1, 2022	14,677	13,513	1,607	29,797
Exchange adjustments	4	219	63	286
Additions	834	3,923	462	5,219
Transfer to investment property	(69)	–	–	(69)
Derecognition	–	(2,021)	(474)	(2,495)
Hyperinflation adjustments	–	47	4	51
At December 31, 2022	15,446	15,681	1,662	32,789
At January 1, 2023	**15,446**	**15,681**	**1,662**	**32,789**
Exchange adjustments	**(9)**	**(61)**	**26**	**(44)**
Additions	**2,391**	**3,518**	**738**	**6,647**
Transfer to inventory	**(737)**	**–**	**–**	**(737)**
Derecognition	**(1)**	**(2,149)**	**(725)**	**(2,875)**
Hyperinflation adjustments	**–**	**74**	**–**	**74**
At December 31, 2023	**17,090**	**17,063**	**1,701**	**35,854**
Accumulated depreciation and impairment:				
At January 1, 2022	1,458	5,838	835	8,131
Exchange adjustments	1	106	24	131
Depreciation charge for the year	303	2,793	476	3,572
Impairment loss	–	48	–	48
Transfer to investment property	(7)	–	–	(7)
Derecognition	–	(1,937)	(474)	(2,411)
Hyperinflation adjustments	–	36	3	39
At December 31, 2022	1,755	6,884	864	9,503
At January 1, 2023	**1,755**	**6,884**	**864**	**9,503**
Exchange adjustments	**(1)**	**(6)**	**13**	**6**
Depreciation charge for the year	**323**	**3,131**	**410**	**3,864**
Impairment loss	**–**	**9**	**–**	**9**
Transfer to inventory	**(56)**	**–**	**–**	**(56)**
Derecognition	**–**	**(2,144)**	**(724)**	**(2,868)**
Hyperinflation adjustments	**–**	**(5)**	**(1)**	**(6)**
At December 31, 2023	**2,021**	**7,869**	**562**	**10,452**
Carrying amount:				
At December 31, 2023	**15,069**	**9,194**	**1,139**	**25,402**
At December 31, 2022	13,691	8,797	798	23,286

During the years ended December 31, 2023 and 2022, certain right-of-use assets were derecognized as a result of lease cancellation or entering into finance sub-leases.

(ii) Amounts recognized in profit or loss

(CNY million)	Note	2023	2022
Interest expenses on lease liabilities	11	**479**	417
Expenses relating to short-term leases		**442**	544
Expenses relating to leases of low-value assets, excluding short-term leases of low-value assets		**35**	31
Variable lease payments not included in the measurement of lease liabilities		**54**	39
Income from subleasing right-of-use assets		**136**	92

(iii) Amounts recognized in summary consolidated statement of cash flows

(CNY million)	2023	2022
Total cash outflow for leases	**6,988**	4,723

(b) As a lessor

Most of the Group's leases are operating leases under which certain properties are leased out (see note 8).

As at December 31, a maturity analysis of undiscounted lease payments to be received after the reporting date is as follows:

(CNY million)	2023	2022
Within 1 year	**128**	115
After 1 year but within 2 years	**68**	104
After 2 years but within 3 years	**57**	78
After 3 years but within 4 years	**54**	76
After 4 years but within 5 years	**50**	73
After 5 years	**176**	324
	533	770

30 Capital commitments

(CNY million)	2023	2022
Contracted for acquisition and construction of long-term assets	**21,518**	21,843
Investment commitment	**2,385**	1,096
Total	**23,903**	22,939

31 Related parties

A related party is a person or an entity that has control or joint control or significant influence over the Group, or is a member of its key management personnel, or is member of the Group, including joint ventures and associates.

Transactions between the Group and related parties are conducted on an arm's length basis. Outstanding receivables and payables with related parties are collected or paid in accordance with contracts, without additional interest or collateral.

Details of the Group's significant transactions with related parties are set out below.

Transactions with related parties

(CNY million)	Associates	
	2023	2022
Sales of goods and services	**1,534**	554
Purchase of goods and services	**2,352**	2,400

Balances with related parties

(CNY million)	Associates	
	December 31, 2023	December 31, 2022
Trade receivables	**72**	34
Contract assets	**9**	84
Other assets	**278**	386
Trade payables	**875**	1,054
Contract liabilities	**206**	18
Other liabilities	**211**	76

32 Group enterprises

(a) Parent and ultimate controlling party

The Group's ultimate controlling party is the Union of Huawei Investment & Holding Co., Ltd.

(b) Major subsidiaries

Name of subsidiary	Place of incorporation	Proportion of ownership interest		Principal activities
		2023	2022	
Huawei Technologies Co., Ltd.	Chinese mainland	**100%**	100%	Development, manufacture and sale of telecommunication and related products and provision of support and maintenance services
Huawei Device Co., Ltd.	Chinese mainland	**100%**	100%	Development, manufacture and sale of mobile communication products and ancillaries
Huawei Machine Co., Ltd.	Chinese mainland	**100%**	100%	Manufacture of telecommunication products
Shanghai Huawei Technologies Co., Ltd.	Chinese mainland	**100%**	100%	Development of telecommunication products
Beijing Huawei Digital Technologies Co., Ltd.	Chinese mainland	**100%**	100%	Development of telecommunication products
Huawei Tech. Investment Co., Limited	Hong Kong, China	**100%**	100%	Trading of materials
Huawei International Co. Limited	Hong Kong, China	**100%**	100%	Distribution of telecommunication products
Huawei International Pte. Ltd.	Singapore	**100%**	100%	Distribution of telecommunication products
Huawei Technologies Japan K.K.	Japan	**100%**	100%	Development and sale of telecommunication products and ancillary services
Huawei Technologies Deutschland GmbH	Germany	**100%**	100%	Development and sale of telecommunication products and ancillary services
Huawei Device (Shenzhen) Co., Ltd.	Chinese mainland	**100%**	100%	Development, manufacture and sale of mobile communication products and ancillaries
Huawei Device (Hong Kong) Co., Limited	Hong Kong, China	**100%**	100%	Sale and related services of mobile communication products and ancillaries
Huawei Cloud Computing Technologies Co., Ltd.	Chinese mainland	**100%**	100%	Development and sale of cloud products
Huawei Technical Service Co., Ltd	Chinese mainland	**100%**	100%	Installation and maintenance of telecommunication products and ancillaries, including consultancy
Huawei Software Technologies Co., Ltd.	Chinese mainland	**100%**	100%	Sale of cloud products and services
HiSilicon Technologies CO., LIMITED	Chinese mainland	**100%**	100%	Development and sale of semiconductors
HiSilicon (Shanghai) Technologies CO., LIMITED	Chinese mainland	**100%**	100%	Development and sale of semiconductors
Hisilicon Optoelectronics Co., Limited	Chinese mainland	**100%**	100%	Development, manufacture and sale of optoelectronic products related to information technology
Huawei Technologies Coöperatief U.A.	Netherlands	**100%**	100%	Intermediate parent company for certain overseas subsidiaries

33 Contingent liabilities

(a) On September 2, 2014 (dates in note 33 are in U.S. time), T-Mobile USA, Inc. ("T-Mobile") filed a civil action against the Group's subsidiary, Huawei Device USA Inc., in relation to the alleged misappropriation of trade secrets relating to certain of T-Mobile's mobile phone test equipment. The two parties reached a settlement on November 8, 2017.

On January 16, 2019, the United States Department of Justice issued an indictment against Huawei Device USA Inc. and Huawei Device Co., Ltd., containing 10 charges in relation to the alleged theft of trade secrets relating to the above equipment and alleged wire fraud and obstruction of justice. The charges relate to the years from 2012 to 2014.

(b) On January 24, 2019, the United States Department of Justice issued an indictment against Huawei Technologies Co., Ltd., Huawei Device USA Inc. and other parties. The indictment contains 13 charges in relation to alleged bank and wire fraud, violation of the International Emergency Economic Powers Act of the United States with respect to certain transactions involving Iran, and associated matters.

On February 13, 2020, the United States Department of Justice issued a superseding indictment which, on top of the charges filed on January 24, 2019, added Huawei Device Co., Ltd. and Futurewei Technologies, Inc. as defendants, and added 3 new charges of alleged racketeering conspiracy, alleged conspiracy to steal trade secrets and alleged conspiracy to commit wire fraud. The superseding indictment also includes new allegations including the defendants' alleged involvement in transactions involving North Korea and Iran.

The Group has engaged external counsels to assist it in respect of the matters referred to in (a) and (b) above. With regard to the matter referred to in (a) above, due to the complexity of the charges contained in this indictment, its overlapping with the superseding indictment issued on February 13, 2020 referred to in (b) above and the difficulties for the parties to prepare for the trial as a result of the continuing outbreak of COVID-19 pandemic, the US Government and the defendants filed motions on September 5, 2019, March 17, 2020, February 23, 2021, February 18, 2022, January 18, 2023 and January 9, 2024, respectively, requesting the trial to be postponed, and such motions were granted by the judge. Pursuant to the judge's latest decision on January 10, 2024, the trial will be continued until October 27, 2025. With regard to the matter referred to in (b) above, it is currently in the process of pre-trial discovery and the trial date has not yet been scheduled.

Given the relatively early stage of these proceedings, as at the date of approval of these financial statements, management considers that both the timing and the outcome of these matters are inherently uncertain, and that the amount of any possible obligation of the Group, if any, cannot be reliably estimated. Accordingly, these indictments give rise to contingent liabilities for the Group and no provision has been made in this regard in these financial statements. It is also not practicable at this stage for the Group to disclose an estimate of the possible future financial effect on the Group's financial statements of these matters.

34 Subsequent events

(a) Subsequent to December 31, 2023 and up to the date of approval of these financial statements, the Group has issued two super & short-term commercial papers, with an aggregate principal amount of CNY6,000 million;

(b) Subsequent to December 31, 2023 and up to the date of approval of these financial statements, the Group has drawn accumulatively CNY15,632 million from two credit facilities entered into by Huawei Technologies Co., Ltd., a wholly-owned subsidiary of the Group.

35 Comparative figures

The presentation of certain prior year comparative figures has been adjusted to reflect current year presentation requirements. None of these changes were material.

Risk Factors

At Huawei, risk factors are defined as those that could cause uncertainty regarding the company's ultimate achievement of its business objectives. We identify such factors in our strategic plans, business operations, financial systems, or the external environment. In this section, we will detail the major risk factors that could significantly impact the company's survival, reputation, financial position, operating results, or long-term prospects.

Huawei's Risk Management System

Huawei uses an Enterprise Risk Management (ERM) system that accounts for our unique organizational structure and operating model, in line with the Committee of Sponsoring Organizations of the Treadway Commission (COSO) framework and referencing the ISO 31000 risk management standard. Under this system, we have defined a robust set of ERM policies and processes, continuously refined our ERM organizations and operating mechanisms, and ramped up efforts to improve risk management and response. Huawei's ERM system ensures the following:

- The Board of Directors approves company plans for managing major risks and crises, and handles unexpected major incidents.
- Business managers, as the primary risk owners in their respective business domains, proactively identify and manage risks to ensure they remain at an acceptable level.

At Huawei, risk management is incorporated into both strategic planning and business planning processes. During strategic planning, we systematically identify and manage strategic risks. During business planning, we balance risk and cost to formulate appropriate countermeasures, and monitor and report on risks as part of performance management during routine operations. Huawei ensures uninterrupted business operations by identifying major risk factors during strategic decision making and business planning, and taking necessary measures to control risks during operations and execution.

Strategic Risks

Digital technology is reshaping the world around us. The intelligent world is approaching faster than ever and we want to make sure that it is an inclusive world in which everyone can benefit from the positive changes brought about by digital technology. Mature commercial applications of new technologies – particularly 5.5G, AI, and cloud computing – are accelerating the digital and intelligent transformation of all industries, presenting enormous opportunities. That said, Huawei's external environment is more volatile and complex than ever. With the world facing the formidable challenge of deciding how globalization should proceed, global economic growth will likely slow over the next few years. This expected stagnation will only be compounded by the US government's sustained efforts to contain the development of leading technologies outside its borders. Despite these challenges, we will continue working hard to survive and thrive.

The digital economy has already become the world's main engine for economic growth, and green and low-carbon development is key to sustaining this growth. The three concurrent trends of digital, intelligent, and green industrial development will each present tremendous growth opportunities within the

information processing and communications industries. In light of this, Huawei will continue focusing on leveraging its ICT strengths to enable the digital and intelligent transformation of all industries, and working with partners and developers to ultimately bring digital to every person, home and organization for a fully connected, intelligent world. Going forward, we will remain committed to embracing a globalized supply chain and working with partners worldwide to develop leading products and build diverse ecosystems.

External Risks

Macro environment: We expect growth to slow in many economies in 2024. Despite slight drops in inflation, many economies will still have higher interest rates than those commonly seen over the last decade. This will discourage investment and affect consumer spending. Furthermore, regional conflicts, geopolitical tensions, and protectionism will continue to undermine both business and consumer confidence. Given this uncertain business environment, Huawei will closely monitor risk and promptly adapt response strategies.

Compliance: Operational compliance provides a solid foundation on which Huawei can survive and continue serving and contributing to the world. Huawei has always been dedicated to compliance with applicable laws and regulations in the countries and regions in which it operates. Through sustained investment, we have established a compliance management system that applies to all our businesses and employees worldwide and covers all legal obligations, including but not limited to trade compliance, financial compliance, anti-bribery compliance, intellectual property (IP) and trade secret protection, and cyber security and privacy. This enables the systematic management of compliance risks through established policies, organizations, regulations, processes, and so on.

Despite these efforts, we may still feel the impact of the complex legal environments of some of the countries and regions in which we operate. For example, there may be a lack of clarity or transparency in regards to local laws or ambiguity surrounding legal systems or law enforcement. Huawei will continue, as always, to learn from industry best practices and take preventive measures to address these risks. The certainty of legal compliance is our best bulwark against the uncertainty of the external environment.

Trade: In 2023, we continued to face pressure from the global economy and international trade. Emerging challenges such as increasing geopolitical tensions, rising inequality, and worsening climate change are concerning both countries and regions in terms of globalization. The probability of trade protectionism and freight route barriers is increasing. Against this complex backdrop, trade is being politicized and increasingly connected to security. Many have decided to cope with these challenges by reducing dependency and mitigating risk, which only further disrupts globalization efforts. In addition, tightening financial policies have increased risks to global trade and industrial production.

Despite the increasing policy uncertainty and tight monetary policies in most economies around the world, the global economy still demonstrated greater-than-expected resilience in 2023. And so, a return to multilateral trade systems must be supported by both individual countries and regions to make the international trade environment more stable, open, and sustainable. This will catalyze economic recovery and create more opportunities for prosperity and development.

As always, Huawei supports open and healthy global markets and advocates for cooperation in both trade and the economy. We will continue to provide security assurance based on standards and verification and do our utmost to uphold international trade rules. We believe that our sustained, long-term efforts in digital innovation and application will fuel emerging businesses such as AI and green energy, support the digital, intelligent, and green transformation of economies worldwide, and create new engines of growth for both trade and the global economy.

Natural disasters: It is our mission and primary social responsibility to maintain stable network operations. In 2023, when a powerful earthquake struck Türkiye, disrupting communications for 13 million people, we immediately dispatched over 100 experts to work alongside our customers in the affected areas. This team worked day and night to recover communications and maintain stable network operations. In the last year, Huawei has similarly helped respond to typhoons in Japan and floods around the world, including in the Democratic Republic of Congo, Pakistan, and Nigeria.

Epidemics and natural disasters like earthquakes, typhoons, and floods can impact Huawei's business operations in many different ways and thus can impact the operations of the networks we have deployed. We have developed contingency plans to respond to different types of natural disasters and epidemics, and continue to improve our capabilities in this regard. This has helped us ensure our own business continuity, and more importantly, ensure network stability for our customers.

Country-specific risks: Huawei currently operates in more than 170 countries and regions worldwide. The complex international economic and political landscape we operate in exposes us to a variety of different risks in different countries and regions. These risks include economic and political instability, exchange rate fluctuations, capital controls, and sovereign defaults. Any one of these risks could hinder Huawei's local business operations and bring uncertainty to our local business development.

In 2024, the high interest rates of developed economies will deal a blow to emerging markets with heavier debt loads, exposing them to risks such as default, capital outflows, and currency depreciation. Considering this, we will closely monitor any changes in the environment, such as those related to post-pandemic economic recovery, regional conflicts, and commodity price fluctuations, and promptly employ effective countermeasures to help achieve business objectives.

Operational Risks

Information security: Although Huawei has a robust information security management system and takes stringent information security measures to protect its IP, it is impossible to completely prevent the improper use of our proprietary assets and information. Even when we are able to protect our IP through judicial means, it is still possible for us to suffer losses due to improper usage.

Intellectual property: Huawei has long been dedicated to independent innovation and will continue to be. We respect the IP of third parties while actively protecting our own. We also constantly work to improve our IP risk control system. Despite this, there still exists the possibility that rights holders may file IP claims against Huawei and third parties may still infringe upon our IP. Huawei will continue to build a high-value IP portfolio and IP capabilities globally. Furthermore, we will continue to follow international rules and industry conventions to address IP disputes and safeguard the operational security of our global businesses.

Corporate Governance Report

The company only exists to serve its customers. The purpose of growing our harvest and increasing the fertility of our soil is to better serve our customers. "Staying customer-centric and creating value for customers" are the company's common values. The conferment of authority is required to drive the facilitation and implementation of the company's common values. However, without effective controls in place, authority un-checked will ultimately hinder such common values. The company has a well-developed internal governance structure, under which all governance bodies have clear and focused authority and responsibility, but operate under checks and balances. This creates a closed cycle of authority and achieves rational and cyclical succession of authority.

The company's fate cannot be tied to any single individual and the governance bodies of the company shall follow a model of collective leadership. This collective leadership model is created upon common values, focused responsibility, democratic centralized authority, checks and balances, and growth by self-reflection.

In addition, the company stays customer-centric, inspires dedication, and continuously improves its governance structure, organizations, processes, and appraisal systems to sustain its long-term and profitable growth.

Shareholders and the Employee Shareholding Scheme

Huawei Investment & Holding Co., Ltd. is a private company wholly owned by its employees. Huawei's shareholders are the Union of Huawei Investment & Holding Co., Ltd. (the "Union") and Mr. Ren Zhengfei.

Through the Union, the company implements an Employee Shareholding Scheme (the "Scheme", or the virtual restricted shares plan), which involved 151,796 individuals, either current employees or retired beneficiaries, as of December 31, 2023. The Scheme effectively aligns employee contribution and development with the company's long-term development, fostering Huawei's continued success.

Mr. Ren Zhengfei is the Company's natural person shareholder and also participates in the Scheme. As of December 31, 2023, Mr. Ren's investment accounted for nearly 0.73% of the Company's total share capital.

The Shareholders' Meeting and the Representatives' Commission

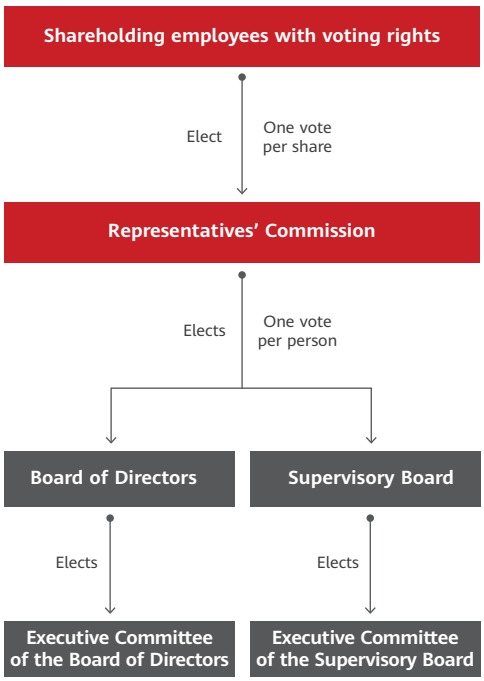
The Shareholders' Meeting, the company's authoritative body, comprises two shareholders: the Union and Mr. Ren Zhengfei.

The Representatives' Commission (the "Commission") is the organization through which the Union fulfills shareholder responsibilities and exercises shareholder rights. The Commission consists of no more than 115 representatives of shareholding employees ("Representatives") and exercises rights on behalf of all shareholding employees. In 2023, the Commission held one meeting. At the meeting, a new Board of Directors was elected, resulting in a new set of regular and alternate directors. The Commission also reviewed and approved the report from the Board of Directors on the company's financial and operating results, the work report from the Supervisory Board, and proposals for matters such as annual profit distribution and annual capital increases.

The Commission holding a meeting in March 2023

The Representatives and Alternate Representatives are elected by the shareholding employees with voting rights, and serve for a term of five years. In the event that there is a vacancy in the Commission, the Alternate Representatives shall take up the vacancy in a predetermined sequence.

The shareholding employees with voting rights elect the Commission on a one-vote-per-share basis, after which the Commission elects the company's Board of Directors and Supervisory Board on a one-vote-per-person basis. The Commission, along with the Board of Directors and Supervisory Board, decides on, manages, and monitors major company matters.



Members of the current Commission are:

Mr. Ren Zhengfei, Ms. Sun Yafang, Mr. Liang Hua, Mr. Guo Ping, Mr. Xu Zhijun, Mr. Hu Houkun, Ms. Meng Wanzhou, Mr. Yu Chengdong, Mr. Wang Tao, Ms. Chen Lifang, Mr. Peng Zhongyang, Ms. He Tingbo, Mr. Li Yingtao, Mr. Yao Fuhai, Mr. Tao Jingwen, Mr. Yan Lida, Mr. Li Jie, Mr. Ren Shulu, Mr. Li Dafeng, Mr. Song Liuping, Mr. Tian Feng, Mr. Yi Xiang, Mr. Li Jianguo, Mr. Peng Bo, Ms. Zhao Minglu, Ms. Shi Yanli, Ms. Zhang Xiaoqing, Mr. Yang Shubin, Mr. Zou Zhilei, Mr. Lu Yong, Mr. Yang Yougui, Mr. Li Peng, Mr. Cao Jibin, Mr. Wu Weitao, Mr. Chen Hao, Mr. Wang Shengniu, Mr. Wang Jianfeng, Mr. Chen Lei, Mr. Wu Hui, Mr. Meng Ping, Mr. Lyu Ke, Mr. Jiang Xisheng, Mr. Pan Shaoqin, Mr. Jiang Yafei, Mr. Wang Weijian, Mr. Su Liqing, Mr. Luo Wencheng, Mr. Zhang Hongxi, Mr. Xiong Lening, Mr. Ying Weimin, Mr. Wu Kunhong, Mr. Wei Chengmin, Mr. Wu Qinming, Mr. Xie Guohui, Mr. Wang Kexiang, Mr. Tang Qibing, Mr. Sun Fuyou, Mr. Ma Yue, Mr. Zhou Jianjun, Mr. Xun Su, Mr. Lu Qi, Mr. Lin Baifeng, Mr. Shen Huifeng, Mr. Zheng Liangcai, Mr. Ma Qingqing, Mr. Wang Hua'nan, Mr. Bai Limin, Ms. Yang Li, Mr. Hou Jinlong, Mr. Hu Kewen, Mr. Zhang Shunmao, Mr. Zha Jun, Mr. Zhou Hong, Mr. Ma Haixu, Mr. Liu Shaowei, Mr. Tang Xinhong, Mr. Yang Chaobin, Mr. Gong Ti, Mr. Cai Changtian, Mr. Gao Ji, Mr. Xiong Yan, Mr. Wang Yixiang, Mr. Li Zhoujian, Mr. He Gang, Mr. Zhang Ping'an, Mr. Bian Honglin, Mr. Xu Qinsong, Mr. Li Xiaolong, Mr. Zhu Ping, Mr. Shao Yang, Mr. Zhu Yonggang, Mr. Chen Yue, Mr. Bai Yi, Mr. Wu Congcheng, Ms. Song Yanling, Mr. Zuo Defeng, Mr. Xia Jian, Mr. Wang Nanbin, Mr. Zheng Pingfang, Ms. Cao Yi, Mr. Ran Weidong, Mr. Du Yanxin, and Mr. Wang Yanmin.

Board of Directors

The Board of Directors (BOD) is the highest body responsible for corporate strategy, operations management, and customer satisfaction. The BOD's mission is to lead the company forward. It exercises decision-making authority for corporate strategy and operations management, and ensures customer and shareholder interests are protected.

The main responsibilities of the BOD are to:

- Develop proposals for corporate governance.
- Review proposals to increase or decrease the company's registered capital, as well as proposals related to profit distribution and loss recovery.
- Review the company's stock options plan and other long-term incentive plans.
- Review or approve the company's plans for entering and exiting different industries, and approve the company's strategic plan.
- Approve major organizational restructuring, management system development, and business transformation.
- Approve major financial policies, financial plans, and business transactions.
- Approve the company's annual budget proposal, annual operations report, and annual audit report.
- Approve the appointment/removal, compensation, and long-term incentives of senior management.
- Approve major HR policies and plans at the corporate level.
- Approve proposals for managing major risks and crises, and manage major emergencies.
- Approve the development of internal controls and compliance systems.

In 2023, the BOD held 12 meetings. At the meetings, the BOD reviewed and approved matters such as the company's medium-to-long-term strategic plan, as well as the company's annual business plan, audit report, profit distribution, and capital increases.

The BOD has 17 members, who are elected by the Commission and then voted in by the Shareholders' Meeting. In March 2023, a new BOD was elected, resulting in a new set of regular and alternate directors. The BOD elected deputy chairs and executive directors, and determined the directors who will attend BOD Executive Committee meetings as non-voting attendees.

Members of the current BOD are as follows:

- Chairman: Mr. Liang Hua
- Deputy Chairs: Mr. Xu Zhijun, Mr. Hu Houkun, and Ms. Meng Wanzhou
- Executive directors: Mr. Wang Tao, Mr. Zhang Ping'an, Mr. Yu Chengdong, and Mr. Li Jianguo
- Directors who will attend BOD Executive Committee meetings as non-voting attendees: Ms. He Tingbo and Mr. Zheng Liangcai
- Directors: Mr. Ren Zhengfei, Mr. Tao Jingwen, Mr. Peng Bo, Mr. Zha Jun, Mr. Hou Jinlong, Mr. Yang Chaobin, and Mr. Ying Weimin

In the event that there is a vacancy in the BOD, alternate directors will take up the vacancy in a predetermined sequence. Alternate directors are Mr. He Gang, Mr. Bai Yi, Mr. Cao Jibin, Mr. Zhou Hong, Mr. Bian Honglin, Mr. Jin Yuzhi, Mr. Lu Yong, Mr. Zou Zhilei, Mr. Jiang Yafei, Mr. Hu Kewen, and Mr. Wang Huanan.

From the left in the first row: Mr. Li Jianguo, Mr. Zhang Ping'an, Mr. Hu Houkun, Mr. Xu Zhijun, Mr. Liang Hua, Ms. Meng Wanzhou, Mr. Wang Tao, and Mr. Yu Chengdong
From the left in the second row: Mr. Yang Chaobin, Mr. Zha Jun, Mr. Zheng Liangcai, Mr. Hou Jinlong, Ms. He Tingbo, Mr. Peng Bo, Mr. Ren Zhengfei, Mr. Tao Jingwen, and Mr. Ying Weimin

Mr. Liang Hua (Howard Liang)

Chairman

Born in 1964, Mr. Liang holds a doctorate degree from Wuhan University of Technology. Mr. Liang joined Huawei in 1995 and has served as President of Supply Chain, CFO of Huawei, President of the Business Process & IT Mgmt Dept, President of the Global Technical Service Dept, Chief Supply Chain Officer, Chairman of the Audit Committee, and Chairman of the Supervisory Board. Mr. Liang is now Chairman of Huawei's Board of Directors.

Mr. Xu Zhijun (Eric Xu)

Deputy Chairman, Rotating Chairman

Mr. Xu holds a doctorate degree from Nanjing University of Science & Technology. He joined Huawei in 1993 and has served as President of the Wireless Network Product Line, Chief Strategy & Marketing Officer, Chief Products & Solutions Officer, Chairman of the Investment Review Board, Rotating CEO of Huawei, and Chairman of the Strategy & Development Committee (SDC). Currently, Mr. Xu serves as Deputy Chairman of the Board and Rotating Chairman of Huawei.

Mr. Hu Houkun (Ken Hu)

Deputy Chairman, Rotating Chairman

Born in 1968, Mr. Hu holds a bachelor's degree from Huazhong University of Science and Technology. Mr. Hu joined Huawei in 1990 and has served as President of the Marketing & Sales Dept in China, President of the Latin America Region, President of the Global Sales Dept, Chief Sales & Service Officer, Chief Strategy & Marketing Officer, Chairman of the Global Cyber Security and User Privacy Protection Committee (GSPC), Chairman of the BOD of Huawei USA, Deputy Chairman of the Board, Rotating CEO, and Chairman of the HRC. Currently, Mr. Hu serves as Deputy Chairman of the Board and Rotating Chairman of Huawei.

Ms. Meng Wanzhou (Sabrina Meng)

Deputy Chairwoman, Rotating Chairwoman

Ms. Meng holds a master's degree from Huazhong University of Science and Technology. Ms. Meng joined Huawei in 1993 and has held positions including Director of the International Accounting Dept, CFO of Huawei Hong Kong, and President of the Accounting Mgmt Dept. Ms. Meng now serves as Deputy Chairwoman of the Board, and Rotating Chairwoman and CFO of Huawei.

Since 2003, Ms. Meng has led the establishment of Huawei's globally unified finance organizational structure, processes, regulations, and IT platforms. From 2007 to 2014, Ms. Meng implemented the Integrated Financial Services (IFS) Transformation Program across the company around the world, making fine-grained management part of Huawei's DNA for sustainable growth.

In 2014, Ms. Meng led the company's data transformation and established a comprehensive data management system, creating a single source for data and making data a strategic asset of the company. During the same period, Ms. Meng implemented transformation programs for Internal Controls over Financial Reporting (ICFR), Consistency of Inventory Accounts and Goods (CIAG), treasury management, and tax management. This has transformed the finance team into a business partner and value integrator, and supported the rapid and stable development of the company's business worldwide.

Since 2019, Ms. Meng has developed a blueprint for the digital transformation of finance based on the company's strategic vision and long-term development plan. She has led the development of key risk indicators and risk control models, making contactless risk controls a reality at Huawei. She has guided the establishment of an agile operations management system which has facilitated intelligent operations management and decision-making based on data and AI algorithms. She has also guided the establishment of an integrated management platform for key financial operations scenarios, to achieve collaborative operations and matrix management based on data sharing and real-time interactions.

Under Ms. Meng's leadership, Huawei has established a world-leading digital and intelligent finance organization, laying a solid foundation for the company's operations and supporting the company's efforts to realize its strategies in the new era.

Mr. Wang Tao (David Wang)

Executive Director

Born in 1972, Mr. Wang holds a master's degree from Xi'an Jiaotong University. Mr. Wang joined Huawei in 1997 and has served as R&D Manager in Wireless, Vice President of the UMTS Technical Sales Dept, President of Technical Sales of the European Area, Managing Director of Huawei Italy and Switzerland, President of the Wireless Network Product Line, President of the Network Product Line, President of ICT Strategy & Marketing, and President of ICT Products & Solutions. Currently, Mr. Wang serves as an Executive Director of the Board, Chairman of the ICT Infrastructure Managing Board, and Chairman of the Investment Review Board.

Mr. Zhang Ping'an

Executive Director

Born in 1972, Mr. Zhang holds a master's degree from Zhejiang University. Mr. Zhang joined Huawei in 1996 and has served as Product Line President, Vice President of Strategy & Marketing, Regional Vice President, Vice President of the Global Technical Service Dept, CEO of Huawei Symantec, COO of the Enterprise BG, President of the Telecom Software Business Dept, and President of the Consumer Cloud Service Dept. Currently, Mr. Zhang serves as an Executive Director of the Board and CEO of Huawei Cloud Computing Technologies.

Mr. Yu Chengdong (Richard Yu)

Executive Director

Born in 1969, Mr. Yu holds a master's degree from Tsinghua University. He joined Huawei in 1993 and has served as 3G Product Director, Vice President of the Wireless Technical Sales Dept, President of the Wireless Network Product Line, President of the European Area, and Chief Strategy & Marketing Officer. Currently, Mr. Yu serves as CEO of the Consumer BG, Chairman of the Board of Directors of the Intelligent Automotive Solution BU, and Director of the Investment Review Board for Smart Devices and Intelligent Automotive Components.

Mr. Li Jianguo

Executive Director

Born in 1964, Mr. Li holds a master's degree in engineering from Huazhong University of Science and Technology. Mr. Li joined Huawei in 1993 and has served as a product R&D engineer, Deputy Manager of the Development and Pilot (D&P) Dept, Manager of the Manufacturing Dept, Executive Vice President of Huawei Electric, Director of the Electronics Assembly Business Dept, Deputy Director of the Supply Chain Mgmt Dept, Director of the Product Engineering & Process Development Dept under the Central Research & Development Unit (CRDU), Director of the PDT/TDT Leaders Mgmt Dept under the CRDU, President of the Manufacturing SBG, an executive member of the Supervisory Board, and a member of the Board. Currently, Mr. Li serves as an Executive Director of the Board and President of the Manufacturing Dept.

Ms. He Tingbo

Director

Born in 1969, Ms. He holds a bachelor's degree in semiconductor physics, a bachelor's degree in communications engineering, and a master's degree from Beijing University of Posts and Telecommunications. Ms. He joined Huawei in 1996 and has held positions in the chip business (development, research, architecture, and supply chain). She has served as R&D Director, President of HiSilicon, and President of the 2012 Laboratories. Currently, Ms. He serves as Chair of Huawei Scientist Committee, ITMT Director, and President of HiSilicon.

Mr. Zheng Liangcai

Director

Born in 1975, Mr. Zheng holds a bachelor's degree from Tsinghua University. Mr. Zheng joined Huawei in 1999 and has served as General Manager of the Rio de Janeiro Representative Office, General Manager of the Mexico Representative Office, President of the Northern Latin America Region, President of the Southern South America Region, President of the Latin America Area, and as a member of the ICT Infrastructure Managing Board, Investment Review Board (IRB), and Human Resources Committee (HRC). Currently, Mr. Zheng serves as a member of the Executive Steering Committee (ESC), Platform Coordination Committee, Disciplinary and Supervisory Committee, Global Cyber Security and User Privacy Protection Committee (GSPC), and President of the Human Resource Mgmt Dept. Mr. Zheng is also a member of the Board who will attend BOD Executive Committee meetings as a non-voting attendee.

Mr. Ren Zhengfei

Director

Born on October 25, 1944 into a rural family where both parents were school teachers, Mr. Ren Zhengfei spent his primary and middle school years in a remote mountainous town in Guizhou Province. In 1963, he studied at the Chongqing Institute of Civil Engineering and Architecture. After graduation, he was employed in the civil engineering industry until 1974 when he joined the military's Engineering Corps as a soldier tasked to establish the Liao Yang Chemical Fiber Factory. Subsequently, Mr. Ren had taken positions as a Technician, an Engineer, and was lastly promoted as a Deputy Director, which was a professional role equivalent to a Deputy Regimental Chief, but without military rank. Because of his outstanding performance, Mr. Ren was invited to attend the National Science Conference in 1978 and the 12th National Congress of the Communist Party of China in 1982. Mr. Ren retired from the army in 1983 when the Chinese government disbanded the entire Engineering Corps. He then worked in the logistics service base of the Shenzhen South Sea Oil Corporation. As he was dissatisfied with his job, he decided to establish Huawei with a capital of CNY21,000 in 1987. He became the CEO of Huawei in 1988 and has held the title ever since.

Mr. Tao Jingwen

Director

Born in 1971, Mr. Tao graduated from Beijing University of Posts and Telecommunications. Mr. Tao joined Huawei in 1996 and has served as a product development engineer, Deputy General Manager of the Market Technology Section, Executive Deputy Director of the International Technical Sales Dept, Executive Vice President and President of the Sub-Sahara Region, President of the Global Technical Sales & Marketing Dept, President of Huawei Device, President of the West European Region, and President of the Quality, Business Process & IT Mgmt Dept.

Mr. Peng Bo (Vincent Peng)

Director

Born in 1976, Mr. Peng holds a bachelor's degree in engineering from Harbin Institute of Technology. Mr. Peng joined Huawei in 1999 and has served as Director of the Vodafone Account Dept, Vice President of the European Area, President of the Carrier BG Global Sales Dept, President of the Global Sales & Accounts Business Dept, and President of the West European Region, Vice President of the Public Affairs and Communications Dept, and President of the Corporate Communications Dept. Currently, Mr. Peng serves as a member of the Board and President of the Global Procurement Qualification Mgmt Dept.

Mr. Zha Jun

Director

Born in 1971, Mr. Zha holds a master's degree from Zhejiang University. Mr. Zha joined Huawei in 1997 and has served as A8010 Development Manager, UMG SPDT Leader, Director of the IMS Product Family, President of the Router & Cyber Security Product Line, and President of the Fixed Network Product Line, and President of the Central Research Institute. Currently, Mr. Zha serves as Director of the 2012 Laboratories and Chairman of the Research and Innovation Management Committee.

Mr. Hou Jinlong

Director

Born in 1970, Mr. Hou holds a bachelor's degree from Shanghai Jiao Tong University. Mr. Hou joined Huawei in 1996 and has served as Wireless GSM R&D Product Director, Chief Engineer of the Wireless Account Dept, Wireless MSC 6.0 Pilot PDT Leader, Wireless Technical Sales Director, Director of the Wireless Network Marketing Dept, CEO of TD Tech, President of the Network Energy Product Line, President of the IT Product Line, President of Cloud & AI Products & Services, and President of the Cloud & AI BG. Currently, Mr. Hou serves as President of Huawei Digital Power Technologies.

Mr. Yang Chaobin

Director

Born in 1972, Mr. Yang holds a master's degree from University of Science and Technology of China. Mr. Yang joined Huawei in 1998 and has served as Director of the Wireless Network Research Dept, President of the LTE Product Line, Chief of the Sweden Research Center, Director of the Wireless Network Solutions Dept, Director of the Wireless Network Marketing Dept, President of the 5G Product Line, and President of the Wireless Network Product Line. Currently, Mr. Yang serves as a member of the Board and President of ICT Products & Solutions.

Mr. Ying Weimin

Director

Born in 1973, Mr. Ying holds a master's degree from Shanghai Institute of Technical Physics of the Chinese Academy of Sciences. Mr. Ying joined Huawei in 1998 and has served as President of the LTE Product Line, President of the GSM & UMTS & LTE Product Line, Director of the Wireless R&D Mgmt Dept, and President of the Global Procurement Qualification Mgmt Dept. Currently, Mr. Ying serves as a member of the Board, Chief Supply Chain Officer, and Director of the Group Procurement Management Committee.

Executive Committee

The BOD has established the Executive Committee, which acts as the standing executive body of the BOD. Entrusted by the BOD, the Executive Committee examines and reflects on major issues within the company, decides on issues authorized by the BOD, and oversees their execution. In 2023, the BOD Executive Committee held 17 meetings.

Members of the current BOD Executive Committee are Mr. Xu Zhijun, Mr. Hu Houkun, Ms. Meng Wanzhou, Mr. Wang Tao, Mr. Zhang Ping'an, Mr. Yu Chengdong, and Mr. Li Jianguo.

Rotating chairs

The BOD and its Executive Committee are led by rotating chairs. During their term, each rotating chair serves as the foremost leader of the company. The term of each rotating chair lasts six months. The rotation sequence is as follows:

- Mr. Hu Houkun:

  October 1, 2023 to March 31, 2024

- Mr. Xu Zhijun:

  April 1, 2024 to September 30, 2024

- Ms. Meng Wanzhou:

  October 1, 2024 to March 31, 2025

Audit Committee

The Audit Committee (AC) operates under the BOD to oversee internal controls, including the internal control system, internal and external audits, corporate processes, legal compliance, and adherence to the *Business Conduct Guidelines* (BCGs).

The main responsibilities of the AC are to:

- Approve the annual internal audit plan, and review its scope, required resources, and audit outputs.
- Approve corporate policies for internal controls; approve the corporate development plan for internal controls and the plan's key milestones; and regularly assess the company's internal control status.
- Evaluate the effectiveness of the ethics and compliance function, legal compliance, and adherence to corporate policies.
- Approve the selection of the external auditor, notify the BOD of any proposed change to the external auditor for approval, approve related budgets, and evaluate the work of the external auditor.
- Supervise the completeness, accuracy, and legal compliance of the company's financial statements; and review compliance with and application of accounting policies as well as financial disclosures.
- Approve internal control Key Performance Indicators (KPIs), and instruct Global Process Owners (GPOs) and business executives to report internal control results.

The AC generally holds monthly meetings and convenes special sessions as necessary. Business executives and various experts are invited to attend as non-voting participants.

In 2023, the committee held nine meetings, focusing on topics such as anti-corruption, internal controls, internal and external audits, and oversight of level-1 organizations. At the meetings, the AC reviewed and approved the company's annual internal controls plans, internal and external audit plans, and the annual oversight plans of level-1 organizations like ICT Infrastructure Business, Consumer Business, Digital Power, and Huawei Cloud Computing. The AC also reviewed the progress and execution results of the above-mentioned plans, and instructed business executives of the organizations that failed to deliver the expected results regarding internal controls improvement to report on their internal controls.

Supervisory Board

As Huawei's highest oversight body, the Supervisory Board exercises the authority of oversight on behalf of the company's shareholders. The Supervisory Board is responsible for the company's survival, development, and long-term prospects. Its core authorities are reflected in leader management, business reviews, and strategic vision. Through the observation of managers and cultivation of managerial candidates, the Supervisory Board promotes the development of leadership pipelines, aiming to ensure that the company has qualified successors. By establishing a rule-based, systematic oversight framework, the Supervisory Board comprehensively oversees matters such as the responsibility fulfillment of BOD directors and other executives, the company's operating and financial status, and compliance and internal control systems, gradually guiding the company to change from experience-based management to rule-based management and enabling businesses to operate freely within preset boundaries.

In 2023, the Supervisory Board improved its basic institutions and organization, observed managers, managed the resource pool of managerial candidates, inspected and examined major areas with potential risks, oversaw the company's operations management, and guided and managed the development of subsidiary boards. In 2023, the Supervisory Board held 18 meetings, and its members attended all BOD meetings as non-voting participants, overseeing and reviewing BOD responsibility fulfillment, and overseeing and assessing the responsibility fulfillment of BOD directors and other executives.

The Supervisory Board has 15 members, who are elected by the Commission and then voted in by the Shareholders' Meeting. On March 29, 2022, a new Supervisory Board was elected, resulting in a new set of regular and alternate members.

Members of the new Supervisory Board are as follows:

- Chairman: Mr. Guo Ping
- Deputy Chairman: Mr. Li Jie
- Executive members: Ms. Chen Lifang, Mr. Yao Fuhai, Mr. Li Dafeng, Mr. Li Yingtao, and Mr. Ma Qingqing
- Members: Mr. Song Liuping, Mr. Ren Shulu, Mr. Tian Feng, Mr. Peng Zhongyang, Ms. Shi Yanli, Ms. Yang Li, Mr. Lyu Ke, and Mr. Li Peng

In the event that there is a vacancy in the Supervisory Board, its alternate members will take up the vacancy in a predetermined sequence. Currently, the Supervisory Board has four alternate members: Mr. Wei Chengmin, Mr. Xu Qinsong, Mr. Wu Qinming, and Mr. Gao Ji.

The Supervisory Board has established the Executive Committee, which acts as the standing executive body of the Supervisory Board. Entrusted by the Supervisory Board, the Executive Committee examines and reflects on major issues within the company, decides on issues authorized by the Supervisory Board, and oversees their execution. In 2023, the Executive Committee of the Supervisory Board held 20 meetings.

Members of the Executive Committee of the Supervisory Board are Mr. Guo Ping, Mr. Li Jie, Ms. Chen Lifang, Mr. Yao Fuhai, Mr. Li Dafeng, Mr. Li Yingtao, and Mr. Ma Qingqing.

From the left in the first row: Mr. Ren Shulu, Mr. Yao Fuhai, Mr. Guo Ping, Mr. Li Jie, and Mr. Li Yingtao
From the left in the second row: Mr. Song Liuping, Mr. Lyu Ke, Ms. Chen Lifang, Mr. Tian Feng, Ms. Shi Yanli, Mr. Peng Zhongyang, Ms. Yang Li, Mr. Li Peng, Mr. Li Dafeng, and Mr. Ma Qingqing

Mr. Guo Ping

Chairman of the Supervisory Board

Born in 1966, Mr. Guo holds a master's degree from Huazhong University of Science and Technology. Mr. Guo joined Huawei in 1988 and has served as R&D Project Manager, General Manager of Supply Chain, Director of Huawei Executive Office, Chief Legal Officer, President of the Business Process & IT Mgmt Dept, President of the Corporate Development Dept, Chairman and President of Huawei Device, Rotating CEO of Huawei, Chairman of the Finance Committee, Deputy Chairman of the Board of Directors, and Rotating Chairman of Huawei. Currently, Mr. Guo serves as Chairman of the Supervisory Board.

Mr. Li Jie

Deputy Chairman of the Supervisory Board

Born in 1967, Mr. Li holds a bachelor's degree in wireless communications and a master's degree in computer image processing from Xi'an Jiaotong University. Mr. Li joined Huawei in 1992 and has served as an R&D engineer, General Manager of a representative office in China, General Manager of the Moscow Representative Office, President of the Commonwealth of Independent States Region, President of the Global Technical Sales Dept, President of the Global Technical Service Dept, President of the Human Resource Mgmt Dept, President of the Joint Committee of Regions, President of Huawei University, and President of the Corporate Leadership Mgmt Dept. Currently, Mr. Li serves as Deputy Chairman of the Supervisory Board and Chief Compliance Officer.

Ms. Chen Lifang (Catherine Chen)

Executive Member of the Supervisory Board

Born in 1971, Ms. Catherine Chen graduated from Northwest University in China. She joined Huawei in 1995 and has served as Chief Representative of the Beijing Representative Office, Vice President of the International Marketing Dept, Deputy Director of the Domestic Marketing Management Office, President of the Public Affairs and Communications Dept, and a member of the Board of Directors. Currently, Ms. Catherine Chen serves as an executive member of the Supervisory Board and Chairwoman of the Subsidiary Board Directors Resources Bureau.

Mr. Yao Fuhai

Executive Member of the Supervisory Board

Born in 1968, Mr. Yao holds a bachelor's degree from University of Electronic Science and Technology of China. Mr. Yao joined Huawei in 1997 and has served as Director of the Pricing Center, Vice President of the Business Process & IT Mgmt Dept, Vice President of the Strategy Cooperation Dept, Vice President of the Global Technical Sales Dept, President of the Global Technical Service Dept, President of the Global Procurement Qualification Mgmt Dept, Chief Supply Chain Officer, Director of the Group Procurement Management Committee, a member of the Supervisory Board, and a member of the Board of Directors. Currently, Mr. Yao serves as an executive member of the Supervisory Board and Chair of the Supervisory Board Lower House.

Mr. Li Dafeng

Executive Member of the Supervisory Board

Born in 1966, Mr. Li holds a bachelor's degree from the Department of Radio Engineering, Changchun Institute of Posts and Telecommunications, and a master's degree in signal and information processing, Harbin Institute of Technology. Mr. Li joined Huawei in 1996 and has served as Deputy Sales Director of the Beijing Office, General Manager of the Tianjin Office, General Manager of the Shijiazhuang Office, Director of the China Telecom Account Dept, Vice President of the Eastern and Southern Africa Region, Director of the MTN Account Dept, President of the Eastern and Southern Africa Region, President of the Middle East and Africa Area, President of the Sales & Delivery Finance Mgmt Dept, and Director of the ICT Infrastructure Managing Board Office. Currently, Mr. Li serves as an executive member of the Supervisory Board.

Mr. Li Yingtao

Executive Member of the Supervisory Board

Born in 1969, Mr. Li holds a doctorate degree from Harbin Institute of Technology. Mr. Li joined Huawei in 1997 and has served as Chief of the Sweden Research Center, Director of the Product Mgmt Dept of Wireless Marketing, Director of the Research Dept of Products & Solutions, Director of the General Technology Office of Products & Solutions, President of the Central Research & Development Unit, President of the 2012 Laboratories, President of Products & Solutions, President of Network Products & Solutions, and President of Administration of the 2012 Laboratories. Currently, Mr. Li serves as an executive member of the Supervisory Board.

Mr. Ma Qingqing

Executive Member of the Supervisory Board

Born in 1973, Mr. Ma holds a master's degree in system engineering from Northwestern Polytechnical University. Mr. Ma joined Huawei in 1997 and has served as an R&D engineer, Senior Product Manager of the Marketing & Sales Dept, Overseas Marketing Director, Director of the Human Resource Dept of Strategy & Marketing, and Director of the Consumer BG Human Resource Dept. Currently, Mr. Ma serves as an executive member of the Supervisory Board, President of the Corporate Leadership Mgmt Dept, Vice President of the Consumer BG, and Vice President of the Intelligent Automotive Solution BU.

Mr. Song Liuping

Member of the Supervisory Board

Born in 1966, Mr. Song completed his postdoctoral research at Beijing Institute of Technology in 1996. Mr. Song joined Huawei in 1996 and has served as Manager of the Product Strategy Planning Dept, Director of the IPR Dept, Director of the External Cooperation Dept, PSST member, President of the Legal Affairs Dept, President of the Patent Review Board, Director of the Trade and Customs Compliance Committee, a member of the Disciplinary and Supervisory Sub-committee of the Human Resources Committee, a member of the Platform Coordination Committee, and Chief Compliance Officer. Currently, Mr. Song serves as a member of the Supervisory Board and Chief Legal Officer.

Mr. Ren Shulu (Steven Ren)

Member of the Supervisory Board

Mr. Ren holds a bachelor's degree from Yunnan University. Mr. Ren joined Huawei in 1992 and has served as General Manager at the Lanzhou Office, the Guangzhou Office, and the Fuzhou Office, Director of the Customer Relationship Mgmt Dept, Director of the Internal Service Mgmt Dept, and President of the Capital Construction Mgmt Dept. Currently, Mr. Ren serves as a member of the Supervisory Board, Chief Logistics Officer, and President of the Power Assurance Dept.

Mr. Tian Feng

Member of the Supervisory Board

Born in 1969, Mr. Tian holds a bachelor's degree from Xidian University. Mr. Tian joined Huawei in 1995 and has served as General Manager of the Shijiazhuang Office, HR Director of the Domestic Marketing Dept, Director of the Market Finance Dept, EVP of the Middle East and Northern Africa Area, President of the Middle East Region, President of the China Region, CEO of Huawei Agisson, Vice President (Acting) of the Human Resource Mgmt Dept, EVP of Huawei University, Director of the Institute of Education of Huawei University, Director of the Disciplinary and Supervisory Sub-committee of the Human Resources Committee, an executive member of the Management Team of the Joint Committee of Regions, Director of the Subsidiary Board Directors Resources Bureau, President of the Central Asia and Russia Area, a member of the Management Team of the Corporate Leadership Mgmt Dept, a member of the Audit Committee, a member of the ICT Infrastructure Managing Board, Director of the Disciplinary and Supervisory Committee, President of the Asia Pacific Area, President of the Internal Audit Dept, and a member of the Supervisory Board. Currently, Mr. Tian serves as a member of the Supervisory Board, Director of the Audit Committee, and Deputy Chairman of the Supervisory Board Lower House.

Mr. Peng Zhongyang

Member of the Supervisory Board

Born in 1968, Mr. Peng holds a bachelor's degree from Huazhong University of Science and Technology. Mr. Peng joined Huawei in 1997 and has served as Technical Service Engineer of the South China Area, Transmission Project Manager and Development Engineer of the Russia Representative Office, General Manager of the Yemen Representative Office, Assistant to President of the Middle East and Northern Africa Region, President of the Northern Africa Region, President of the China Region, President of the Corporate Leadership Mgmt Dept, and President of the Enterprise BG. Currently, Mr. Peng serves as a member of the Supervisory Board and the Lead of the Strategic Reserve.

Ms. Shi Yanli

Member of the Supervisory Board

Born in 1974, Ms. Shi holds a master's degree from Central University of Finance and Economics. Ms. Shi joined Huawei in 2000 and has served as Director of the China Accounting Shared Service Center, Director of the Argentina Accounting Shared Service Center, Director of the Revenue Business Center, Director of the Accounting Solution Business Center, CFO of the West European Region, Vice President of the Accounting Mgmt Dept, President of the Accounting Mgmt Dept, and President of the Subsidiary Mgmt Dept. Currently, Ms. Shi serves as a member of the Supervisory Board and Deputy CFO of the Group Finance Mgmt Dept.

Ms. Yang Li

Member of the Supervisory Board

Born in 1963, Ms. Yang holds a master's degree from Huazhong University of Science and Technology. Ms. Yang joined Huawei in 1998 and has served as Head of the HR Director Office, Assistant to HR Director of Sales & Services, Deputy HR Director of the Commonwealth of Independent States Area, Director of the Talent Mgmt Dept of the Human Resource Mgmt Dept, HR Director of the CEE & Nordic European Region, and Director of the HR Section of the Human Resources Committee. Currently, Ms. Yang serves as a member of the Supervisory Board, Chief Ethics & Compliance Officer, and Director of the Committee of Ethics and Compliance.

Mr. Lyu Ke (Jack Lyu)

Member of the Supervisory Board

Born in 1968, Mr. Lyu holds a master's degree in information and electronics engineering from Zhejiang University, and an EMBA from China Europe International Business School. Mr. Lyu joined Huawei in 1993 and has served as a software engineer, project manager, Director of the Corporate Technical Cooperation Dept, Chief Operating Officer of Huawei Technologies India Private Limited (HTIPL), HR Director of R&D, President of the Human Resource Mgmt Dept, President of Huawei University, Lead of the Strategic Reserve, President of the Corporate Leadership Mgmt Dept, and Chairman of the Corporate Advisory Committee. Currently, Mr. Lyu serves as a member of the Supervisory Board, a member of the Supervisory Board Upper House, and the Leader of the Supervisory Board Upper House Secretary Team.

Mr. Li Peng

Member of the Supervisory Board

Born in 1977, Mr. Li holds a bachelor's degree from Tongji University. Mr. Li joined Huawei in 1999 and has served as General Manager of the Xi'an Representative Office, Assistant to the President of the China Region, President of the Eastern and Southern Africa Region, President of the Southern Africa Region, President of the West European Region, and President of the Carrier BG. Currently, Mr. Li serves as a member of the Supervisory Board and President of ICT Sales & Service.

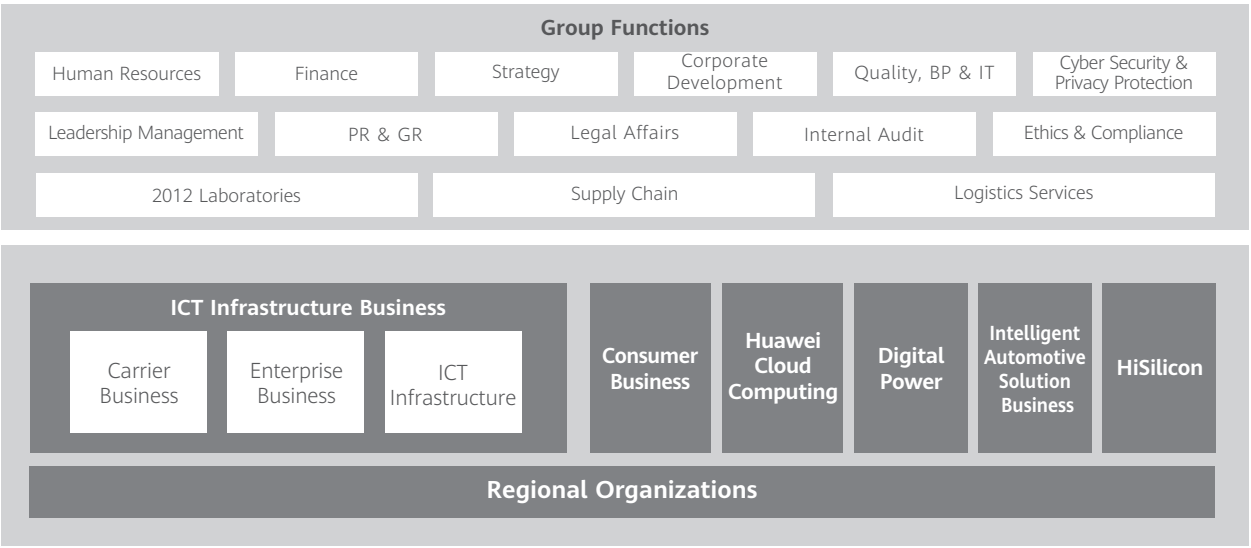
Independent Auditor

An independent auditor is responsible for auditing a company's annual financial statements. In accordance with applicable accounting standards and audit procedures, the independent auditor expresses an opinion as to whether the financial statements are true and fair.

The scope of the financial audit and the annual audit results are subject to review by the Audit Committee. Any relationship or service that may potentially affect the objectivity and independence of the independent auditor must be discussed with the Audit Committee. The independent auditor may discuss any issues identified or any difficulties encountered during the course of the financial audits with the Audit Committee.

KPMG has been Huawei's independent auditor since 2000.

Business Structure



As one of Huawei's core businesses, the ICT Infrastructure Business comprises the Carrier Business, the Enterprise Business, and ICT Infrastructure. By working on information distribution, interaction, transmission, processing, and storage, Huawei helps customers build CT and IT infrastructure with its leading, innovative products, solutions, and services.

- In the carrier market, Huawei continuously innovates with leading carriers, to explore business scenarios and verify key technologies, thus helping carriers constantly enhance their core digital infrastructure capabilities, growing together with them in their new business domains, and serving as an enabler of carriers' digital and intelligent transformation.

- In the enterprise market, Huawei works to build a "partner + Huawei" open cooperation system for NAs and the commercial and distribution segments. With a focus on industries' valued scenarios, Huawei provides integrated solutions to accelerate the digital and intelligent transformation of industries, and creates new value together with them.

- ICT Infrastructure comprises Connectivity, Computing, Data Storage, and Carrier Software and Service. In Connectivity, Huawei proactively works with industry partners to define 5.5G and build leading, innovative network infrastructure based on wireless, optical, intelligent IP, and cloud core networks, as part of the effort to continuously drive the connectivity industry forward. In Computing, Huawei works alongside its partners around the world to develop digital infrastructure ecosystems based on Kunpeng, Ascend, and foundational software like Euler, CANN, and MindSpore, establishing the computing backbone for the digital world. In Data Storage, Huawei proactively embraces new media and new applications, and builds a secure, reliable, green, and efficient storage pedestal for a rich variety of application scenarios. In Carrier Software and Service, by focusing on the entire lifecycle of ICT infrastructure, including planning, construction, network O&M, optimization, and operations, Huawei works with its partners to deliver users better service experience and facilitate carrier and enterprise customers' business success.

The Consumer Business continues to put consumers at the center of everything it does. By focusing on quality products, the Consumer Business aims to create an inspired AI experience across all scenarios and build a brand that has a human touch and is liked and trusted by consumers. The Consumer Business also works to build a prosperous HarmonyOS ecosystem and achieve business success together with its partners.

Huawei Cloud Computing provides stable, reliable, secure, trustworthy, and innovative cloud services to customers. Huawei Cloud Computing aims to deliver Everything as a Service, accelerate intelligence, reshape industries, and build the cloud foundation for an intelligent world with ubiquitous cloud and pervasive intelligence.

Digital Power offers enterprise and industry customers products and solutions like smart PV, smart charging networks, data center facility, critical power supply, and DriveONE. Digital Power is committed to integrating digital and power electronics technologies to provide customers with high-quality, highly-efficient, green, and low-carbon power electronics products, facilitating customers' business success.

The Intelligent Automotive Solution Business has brought Huawei's expertise in ICT to the intelligent automotive sector, providing new components for intelligent connected vehicles and helping car OEMs build better vehicles with ICT technologies.

HiSilicon provides board-level chipsets and module solutions to sectors like smart devices, home appliances, and automotive electronics. It offers end-to-end technological capabilities like sensing, connectivity, computing, and display to help devices go digital, connected, intelligent, and low-carbon. Based on chipsets and components, HiSilicon works to empower connected smart devices, enable innovations across different sectors, and help customers achieve business success.

To gradually build a shared service platform to support the development of our multiple businesses and create an anchor for corporate policy execution, the company operates a Platform Coordination Committee. This committee is designed to drive group functions to optimize their execution and operations, simplify cross-function operations, and strengthen collaboration, so that group functions will become the best service organizations available to support and promote business operations. Group functions provide business support, services, and oversight. They are positioned to offer accurate, timely, and effective services to field offices and strengthen oversight while delegating sufficient authority to them.

Improving the Internal Control System

Huawei continued to design and implement an internal control system based on its organizational structure and operating model. The internal control framework and its management system apply to all business and financial processes of the company and its subsidiaries and business units. The internal control system is based on the five components of the COSO framework: Control Environment, Risk Assessment, Control Activities, Information & Communication, and Monitoring. It also covers internal controls of financial statements to ensure their truthfulness, integrity, and accuracy.

Control Environment

A control environment is the foundation of an internal control system. Huawei is committed to a corporate culture of integrity, business ethics, and compliance with laws and regulations. Huawei has issued the BCGs to identify acceptable business conduct. The BCGs must be observed by all employees, including senior executives. Regular training programs are offered, and all employees are requested to sign the BCGs to ensure that the BCGs have been read, understood, and observed.

Huawei has implemented a mature governance structure, with clearly defined authorization and accountability mechanisms. The governance structure comprises the Board of Directors (BOD), its committees, group functions, and multi-level management teams. Huawei clearly defines the roles and responsibilities of its organizations to ensure the effective separation of authority and responsibilities as well as checks and balances through mutual oversight. The CFO of Huawei is in charge of internal controls. The internal control management department reports to the CFO for any possible defects and improvements already made in terms of internal controls, and assists the CFO in building the internal control environment. The internal audit department independently monitors and assesses the status of internal controls for all business operations.

Risk Assessment

Huawei has a department dedicated to internal controls and risk management to regularly assess risks to the company's global business processes. This department identifies, manages, and monitors significant risks, forecasts potential risks caused by changes to the internal and external environments, and submits risk management strategies along with risk mitigation measures for decision making. All process owners are responsible for identifying, assessing, and managing business risks and taking necessary internal control measures. Huawei has instituted a mechanism for improving internal controls and risk controls to efficiently manage critical risks.

Control Activities

Huawei has established the Global Process Management System and the Business Transformation Management System, released the global Business Process Architecture (BPA), and appointed Global Process Owners (GPOs) in line with the BPA.

Responsible for building processes and internal controls, GPOs:

- Identify key control points and the Separation of Duties Matrix for each process, and apply these to all regional offices, subsidiaries, and BUs.
- Conduct compliance tests on key control points and issue test reports to ensure the effectiveness of internal controls is continuously monitored.
- Optimize processes and internal controls based on business pain points and key requirements for financial statements. The aim is to improve operating efficiency and financial results, ensure compliance and the accuracy and reliability of financial statements, and help achieve business objectives.
- Perform annual assessments of internal controls, comprehensively assess overall process design and process execution within each business unit, and then report the results to the Audit Committee (AC).

Information & Communication

Huawei has developed multi-dimensional information and communication channels to ensure the timely acquisition of external information from customers, suppliers, and other parties. It has also created formal channels for transferring internal information, and offered an online space, the *Xinsheng Community*, for employees to freely communicate their thoughts and ideas. Corporate management holds regular meetings with departments at all levels to effectively communicate management orientation to employees and ensure effective implementation of management decisions. All business policies and processes are available on the company's Intranet.

Managers and process owners regularly organize training programs on business processes and internal controls to ensure that up-to-date information is made available to all employees. The company has established a mechanism for process owners at all levels to regularly communicate with each other, review the execution of internal controls, follow up on internal control issues, and implement improvement plans.

Monitoring

Huawei has established an internal complaint channel, an investigation mechanism, an anti-corruption mechanism, and an accountability system. The *Agreement on Honesty and Integrity* that Huawei has signed with its suppliers clearly stipulates that suppliers may report improper conduct by Huawei employees through the channels stipulated in the *Agreement* to assist the company in monitoring the integrity of its employees. The internal audit department independently assesses the overall status of the company's internal controls, investigates any suspected violations of the BCGs, and reports the audit and investigation results to the AC and senior management. Huawei has also implemented a mechanism for internal control appraisals of GPOs and regional managers, holding them accountable and pursuing impeachment when and where necessary. The AC and the CFO regularly review the company's internal control status, and listen to and review reports on action plans for improving internal controls and plan execution progress. Both have the authority to request the relevant GPOs or business executives to explain their internal control issues and take corrective actions.

Sustainable Development

Introduction

Sustainable development is a responsibility shared by the entire world. As a leading global provider of ICT infrastructure and smart devices, Huawei's vision is to bring digital to every person, home and organization for a fully connected, intelligent world. We believe that if we S.H.A.R.E. (work towards sustainability, harmony, all-inclusiveness, reliability, and environmental friendliness), we can create a better, sustainable, and digital future. We want to maximize equality and inclusion by making technology accessible to all and strike a balance between social development and environmental protection through technological innovation. We also want to develop secure and reliable ICT infrastructure and services that safeguard the digital world and work with our industry partners to build a healthy and harmonious business ecosystem.

Sustainability strategies and 2023 progress

Digital Inclusion

TECH4ALL: Since the launch of Huawei's TECH4ALL digital inclusion initiative in 2019, we have implemented a number of projects that leverage digital technologies and multi-stakeholder partnerships to make the world more inclusive and sustainable.

400,000

TECH4ALL's education programs have benefited 630 schools and more than 400,000 people, including K–12[1] students and teachers, unemployed young people, and senior citizens.

53

Huawei's digital technologies have helped preserve biodiversity and sustainably manage and use natural resources in 53 of the world's protected areas.

42,000

Huawei has worked with seniors universities, local community organizations, and nursing homes to provide digital literacy training in 210 cities in China, benefiting more than 42,000 senior citizens.

90 million

Huawei's ICT solutions have brought connectivity to 90 million people in rural and remote areas in nearly 80 countries around the world.

Security and Trustworthiness

Taking responsibility to build trust: Cyber security and privacy protection are a top priority at Huawei, and so we are continuing to invest and remain transparent in both areas. We have worked hard to improve our software engineering capabilities and practices, build resilient networks, develop trustworthy and high-quality products, and support stable network operations.

57

Huawei was awarded 57 cyber security certificates, giving our customers internationally-recognized security assurances.

29,000

We promptly and effectively handled over 29,000 requests from personal data subjects to protect their rights.

60

We carried out over 60 inspections and audits against industry best practices, ensuring that our corporate privacy protection policies are well enforced.

300

Huawei supported stable communications during over 300 disasters and major events.

Environmental Protection

Contributing to a clean, efficient, low-carbon, and circular economy: Huawei aims to continuously explore an optimal way to build a low-carbon, circular economy and find innovative solutions that make our own value chain greener. As part of these efforts, we have integrated requirements including compliance with environmental laws and regulations, energy efficiency, and environmental benefits into our business activities, such as R&D, operation, procurement, manufacturing, and supply chain.

997.9 billion

Huawei's digital power solutions have helped customers generate 997.9 billion kWh of green power and save 46.1 billion kWh of electricity.

2.6x

The average energy efficiency of Huawei's main products has increased 2.6 times since 2019 (base year).

780,000

A total of 780,000 devices have extended their lifespan through our trade-in program.

0.5%

Only 0.5% of the e-waste from Huawei's ICT business, and zero e-waste from our smart device business, went to landfills.

[1] K–12 refers to the educational journey from kindergarten to the 12th grade.

Healthy and Harmonious Ecosystem

Collaborating for the common good: Huawei is committed to operating with integrity and complying with applicable laws and regulations. We value employee development and help employees realize their full potential. We conduct due diligence on our global supply chain to ensure its sustainability and we actively contribute to the communities we operate in. Our goal is to work with all industry partners to build a healthy and harmonious business ecosystem.

CNY18.6 billion

Huawei invested over CNY18.6 billion in employee benefits.

3.4 million

The Seeds for the Future 2.0 program has been implemented in more than 150 countries and regions, benefiting over 3.4 million people.

1,600

Huawei assessed the sustainability performance of over 1,600 major suppliers, representing over 90% of our procurement spending.

300

Huawei operated over 300 social contribution programs worldwide as part of its community responsibilities.

2023 sustainability honors and awards

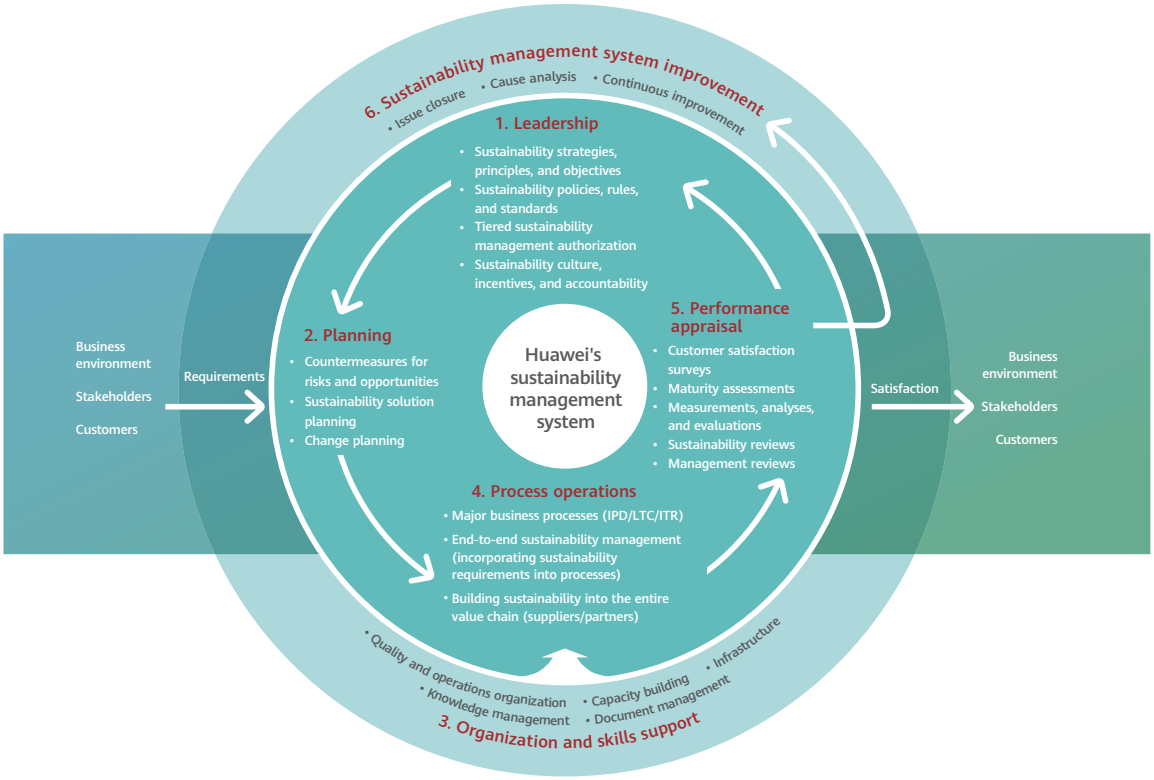
Honor/Award	Issued By
Climate A List	CDP
2023 Sustainability Champion Award	AfricaCom
GSMA GLOMO's "Best Mobile Innovation for Emerging Markets" for Huawei's RuralLink solution	GSMA
Innovative Breakthrough in Mobile Technology Award and Outstanding Award for Huawei's Green Target Network program	Global TD-LTE Initiative (GTI)
Neurons Awards Special Jury Prize for a TECH4ALL project designed to protect endangered wild Atlantic salmon in Norway	Jury of World AI Cannes Festival (WAICF) 2023
First Prize in China Outstanding ICT Case Studies for a TECH4ALL project designed to monitor biodiversity in the Yellow River Delta National Nature Reserve	China Association of Communication Enterprises
Smartphone OS/UI Elderly-friendliness Assessment – Five Stars for HarmonyOS 3	China Telecom Research Institute
Top Employer in Europe	Top Employers Institute
Climate Performance Assessment Gold Rating	Climate Choice (commissioned by Telefonica and T-Systems)
Customs Compliance Award	Jordan Customs
Best Contribution to Cyber Security	Vietnam Information Security Association (VNISA)
Best Data Privacy Governance	Association of Big Data & AI (ABDI), Indonesia
Prime Minister Award: Best of Contributor in Human Capital Development Award	National Innovation Agency (NIA), Thailand
Hong Kong Authorized Economic Operator Partnership Scheme Gold Award	Hong Kong Customs

2023 sustainability milestones

Time	Milestone
February 2023	Huawei joined the UNESCO Global Alliance for Literacy (GAL) and agreed to work with the GAL's Secretariat, the Institute for Lifelong Learning (UIL), to promote ICT-powered literacy initiatives. As per the cooperation agreement, Huawei will fund an expansion of the UIL's current initiatives to increase educators' use of technology in developing countries. Huawei is the first private company to become an associate member of the GAL.
June 2023	On the 50th anniversary of World Environment Day, Huawei and the International Union for Conservation of Nature (IUCN) held the 3rd Tech4Nature Summit, where global partners shared real-world examples of how technology has improved biodiversity conservation. Digital technologies, such as cloud computing, IoT, mobile Internet, big data, and AI, can enable smarter sensing, analysis, and management in protected areas and better support conservation efforts. At the summit, Huawei, IUCN, and the Chinese Academy of Forestry jointly launched the *Smart Protected Areas White Paper* which summarizes their own studies on how technology empowers conservation.
July 2023	Huawei held the Eco-Connect Sub-Saharan Africa 2023 in Johannesburg, South Africa. Themed "Leading Digital for New Value Together", the conference attracted nearly 3,000 partners and customers from more than 10 countries in the region. During the event, Huawei announced its plan to invest US$30 million in the region for partner capability enhancement, joint brand activities, joint solution innovation, and local talent cultivation.
August 2023	Huawei launched HarmonyOS 4, which comes with upgraded accessibility capabilities such as Smart Q&A, easy hearing aid connection, Senior mode, and Celia Call. These features help users with special needs and the elderly overcome accessibility challenges in their work and life, and give users more ways to communicate with the world.
September 2023	Huawei joined the 2nd Digital with Purpose Global Summit hosted by the Global Enabling Sustainability Initiative (GeSI), where more than 200 leaders from around the world gathered to provide insights on revolutionary digital enabling solutions that can help meet the Sustainable Development Goals (SDGs). Huawei's Autonomous Driving Storage Solution was shortlisted for the Digital with Purpose Award, which was designed to recognize digital solutions that drive sustainable development.
November 2023	Huawei held its 2023 Sustainability Forum and five regional sessions in China, Italy, Ghana, Pakistan, and Brazil. Themed "Thriving Together with Tech: Realizing Sustainable Development", the event showcased the best sustainability practices of Huawei and its partners. Attendees from all over the world explored how digital infrastructure can better drive sustainable development and contribute to a greener and more inclusive intelligent world.
December 2023	At the 28th Conference of the Parties to the UN Framework Convention on Climate Change (COP 28), Huawei released the *Twin Skills for the Twin Transition: Defining Green Digital Skills and Jobs* white paper. Developed in collaboration with the ATHENA Research Centre, the Sustainable Development Unit under AE4RIA, PwC, and EIT Digital, the white paper focuses on developing a new classification system for Green Digital Skills that can guide the reskilling and upskilling necessary to build and use the net-zero technologies required to meet the *Paris Agreement* objectives.

Sustainability management

Huawei has established a systematic sustainability management system based on standards such as ISO 26000 and the Responsible Business Alliance (RBA) Code of Conduct. We closely watch both our internal and external environments to identify sustainability risks and opportunities and drive continuous improvement in our management system. This will support the implementation of our sustainability strategies, ensure operational compliance, and continuously improve stakeholder satisfaction.



Framework of Huawei's sustainability management system

Huawei established its Corporate Sustainable Development (CSD) Committee over 10 years ago. This Committee meets each quarter and convenes special meetings as necessary to discuss and decide on sustainability issues. In 2023, major topics discussed by the Committee included sustainability-related work priorities, the sustainability management system, energy conservation and emissions reduction, business- and function-specific strategic plans and work priorities related to sustainability, digital inclusion, employee care, and the circular economy.

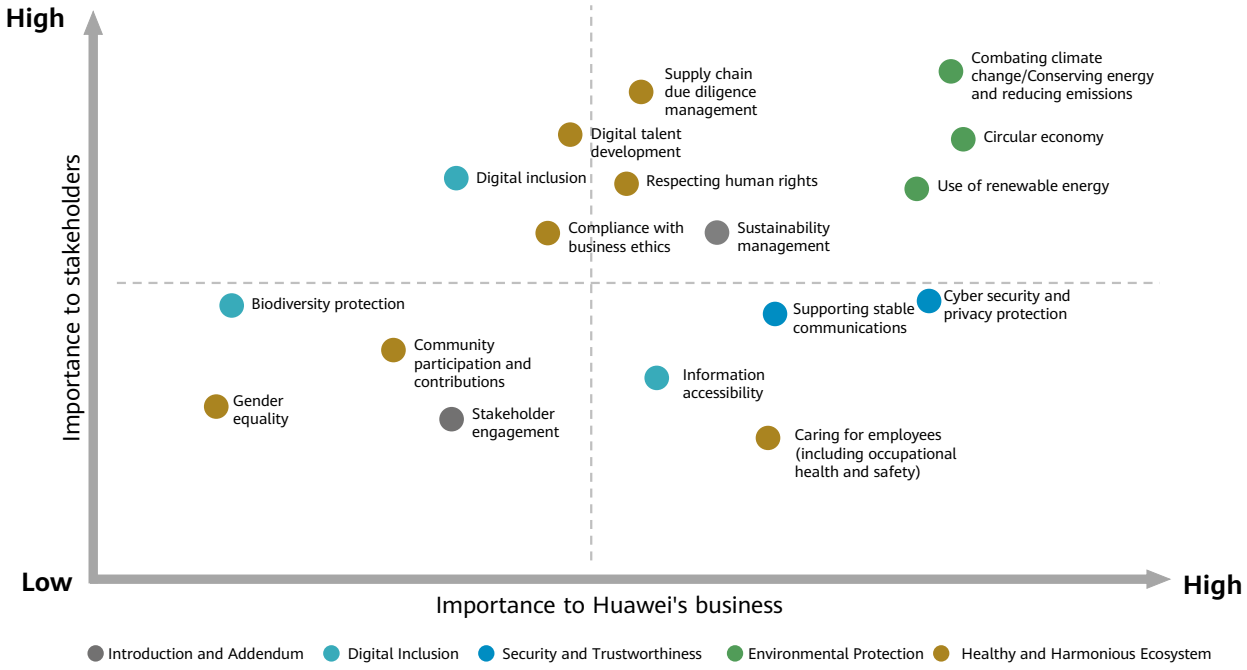
A dozen senior executives serve on the Committee, representing a wide variety of departments, including HR, manufacturing, logistics, procurement, and R&D. Four of the current committee members are also members of Huawei's Board of Directors. The CSD Committee is chaired by Tao Jingwen, a board member and the President of the Quality, Business Process & IT Department.

For more details about Huawei's sustainability management, visit:
https://www.huawei.com/en/sustainability/management

Sustainability organization memberships

Focusing on material topics

Material topics represent the most significant impacts of an organization on the economy, environment, and people. In 2023, we reviewed our material topic matrix through stakeholder surveys and interviews, external consulting and insights, engagement with the media and the public, as well as internal risk assessment and strategic alignment. Following the review, we increased the priority of "sustainability management", "digital talent development", and "circular economy" in order to better respond to stakeholder requirements.



Digital Inclusion

In 2019, Huawei launched the TECH4ALL initiative to promote digital inclusion. Over the past five years, we have worked with more than 40 partners, including UNESCO and IUCN, and made substantial progress in TECH4ALL's four areas of focus: education, environment, health, and development. We have developed innovative applications and content using digital technologies, such as broadband connectivity and IoT, which have brought long-term positive changes to rural and remote areas, underserved communities, and environmental protection efforts.

Driving equity and quality in education

At the Digital Learning Week in 2023, UNESCO acknowledged that innovative digital technologies had demonstrated their potential to enrich and transform education. They will transform how we learn, enhance the quality of learning, make education more inclusive, and improve education administration and governance. As part of our efforts to contribute to UN SDG 4 (Quality Education), Huawei is working with global partners, including education organizations, governments, universities, and carriers, and using digital technologies to make educational resources more accessible, including high-quality education for underserved communities and people in rural and remote areas. By the end of 2023, Huawei's TECH4ALL education programs had benefited 630 schools and more than 400,000 people, including K–12 teachers and students, unemployed young people, and senior citizens.

Technology-enabled Open School Systems for All

The Technology-enabled Open School Systems for All (TeOSS) project is led by UNESCO and jointly implemented by Huawei and the Egyptian, Ethiopian, and Ghanaian ministries of education. The project aims to implement and promote a new model of open learning by providing school terminal access, network connectivity, and education cloud platforms. As part of this project, we built a national training center and online platform in Egypt, allowing K–12 teachers to develop digital skills through offline training and access high-quality online teaching resources. The project has been piloted in 34 schools in Ethiopia and Ghana, benefiting 831 teachers.

In October 2023, UNESCO and Huawei jointly held the International Forum on Digital Platforms and Competencies for Teachers in Cairo, Egypt. More than 330 government representatives, education experts, and scholars from over 50 countries attended the forum and shared the progress that the TeOSS project had made over the past three years.

The TeOSS project enables K–12 teachers, students, and other educators in Egypt to use digital technology and content for teaching and learning.

DigiSchool in China: Improving scientific and technological literacy in K–12 schools

In 2021, Huawei launched the DigiSchool project in Yudu county, Jiangxi province, China. Together with universities and other partners, we have developed a series of inquiry-based and multidisciplinary science and technology courses and STEAM[1] resources for teachers and students in remote and rural areas. These have been used to build engaging and interactive spaces where students can learn about cutting-edge technologies like 5G and AI. By the end of 2023, more than 4,800 teachers and students from 29 elementary and middle schools in rural areas of Ningxia, Jiangxi, and Hebei provinces had benefited from this project. Our efforts have helped the teachers improve their digital literacy and inspired the students' curiosity about science and technology.

Huawei's DigiSchool inspires rural children's curiosity about science and technology.

[1] STEAM education is a learning approach that integrates science, technology, engineering, arts, and mathematics, aiming to guide student inquiries, discussions, and problem solving in these fields.

DigiTruck and SmartBus: Benefiting over 80,000 people from 16 countries

Since 2019, Huawei and its partners have run DigiTruck and SmartBus, two Skills on Wheels projects, to equip unemployed young people and senior citizens in remote areas with digital skills, and provide cyber security training for middle school students. By the end of 2023, over 80,000 people from 16 countries in Africa, the Middle East, and Europe had benefited from these projects.

DigiTruck and SmartBus have benefited over 80,000 people from 16 countries in Africa, the Middle East, and Europe.

Conserving nature with technology

Biological diversity resources are the pillars upon which we build civilizations. Conserving nature and biodiversity is key to slowing global warming and achieving sustainable development. Huawei believes that digital technology can help people protect nature and tackle climate crises, so we are working closely with global environmental protection organizations, carriers, and partners on projects that explore the use of ICT to protect forests and wetlands and increase the efficiency of biodiversity and natural resource conservation and management.

By the end of 2023, Huawei had harnessed the power of digital technology to implement conservation projects in 53 of the world's protected areas. These projects have helped protect many endangered species, including Hainan gibbons, jaguars, Oriental storks, Bonelli's eagles, and Atlantic salmon. Our conservation efforts have also helped protect tropical rainforests, mangrove forests, coral reefs, estuaries, and other typical ecosystems.

Tech4Nature

In 2020, Huawei and IUCN launched the Tech4Nature program. In China, Mexico, Mauritius, Switzerland, and Spain, we implemented multiple Tech4Nature pilots that explored the use of digital technology to protect ecosystems and endangered species. We also supported nearly 300 protected areas in earning the IUCN Green List certification through digital platforms.

In Mexico's Dzilam State Reserve, we have collected and analyzed more than 80,000 images and videos and over 600,000 audio recordings. This data helped identify 146 species, including seven wild jaguars.

In the Hainan Tropical Rainforest National Park, Huawei works with partners to monitor the calls of Hainan gibbons. More than 100,000 audio recordings have been collected and transmitted in real time and individual gibbons now can be automatically identified.

In Pointe aux Feuilles on the eastern coast of Mauritius, Huawei works with local NGOs to restore coral reefs using digital technology. Nearly 25,000 coral fragments have been planted underwater, which helps restore the biodiversity of these ecosystems.

Using digital technology to protect endangered birds in the Yellow River Delta Wetland

Since 2022, Huawei has partnered with the Yellow River Delta National Nature Reserve which oversees the world's youngest wetland ecosystem. This wetland is home to more than 90 endangered bird species, as well as China's largest population of Oriental storks. The use of technology has reduced the impact of human activities on the environment, and created more possibilities for biodiversity conservation. Now 47 species can be automatically identified, helping the nature reserve work more efficiently. In November 2023, the China Association of Communication Enterprises awarded this project the first prize in the China Outstanding ICT Case Studies awards.

Huawei helps the Yellow River Delta National Nature Reserve work more efficiently.

Capturing invasive salmon with intelligent automatic filtering systems

The survival of Norway's native wild salmon (Atlantic salmon) is under threat from invasive species. Since 2021, Huawei has been working with Berlevåg Jeger-og Fiskerforening (BJFF), an NGO and association of hunters and anglers in Norway, to use innovative technologies against invasive species. We have deployed a system that automatically identifies and filters different types of salmon in the Storelva and Kongsfjord Rivers in northeastern Norway, with the one in the Kongsfjord River being solar-powered. The system has so far identified and captured

more than 6,000 invasive salmon with an accuracy of over 99%. This helps Atlantic salmon and other local fish species swim upstream and complete their migratory spawning process without interference, and effectively conserves the local salmon ecosystem.

The automatic salmon identification and filtering system in the Kongsfjord River in Norway

Enabling inclusive health and well-being

Huawei believes that everyone should have equal access to technology and the benefits it can bring. We are committed to bridging the digital divide and leaving no one behind in the digital world. Through our TECH4ALL initiative, we strive to help senior citizens better adapt to the digital world, facilitate smooth communication for people with disabilities, and address the digital inequalities faced by underserved communities.

Helping senior citizens navigate the digital world through digital literacy training

Huawei has leveraged its device products and expertise in Internet applications to develop a range of courses and teach senior citizens simple and useful digital skills, so that they can adapt to the digital world. By the end of December 2023, Huawei and its partners, such as the Seniors University of China, had provided training and coaching to more than 42,000 senior citizens in seniors universities, local community organizations, and nursing homes across 210 cities in China.

Huawei's training program for senior citizens helps them adapt to the digital world.

Information accessibility

In 2023, Huawei helped partners develop a sign language model that can better understand sign language and more accurately translate between sign language and Chinese, in order to help people with hearing impairments express and communicate information more conveniently and accurately.

The sign language model helps people with hearing impairments express and communicate information more conveniently and accurately.

Driving inclusive digital development

According to ITU, 2.6 billion people around the world were still not connected to the Internet in 2023. To achieve universal and meaningful connectivity by 2030, we need to invest more in the digital development of rural and remote areas in low- and middle-income countries, including building infrastructure, formulating policies and regulations, and developing localized digital skills training courses and content. This will give local residents access to affordable devices, data, and services. By the end of 2023, Huawei's ICT solutions had brought connectivity to 90 million people in rural and remote areas in nearly 80 countries around the world.

Smart Villages project in Pakistan: Driving balanced rural development

In Pakistan, a large number of people live in rural and remote areas and lack digital infrastructure as well as the knowledge and basic digital skills needed to fully utilize the Internet. To help address the problem, Huawei, the ITU Telecommunication Development Sector (ITU-D), the Pakistani Ministry of Information Technology and Telecommunication's Universal Service Fund (USF), and the UN Development Programme (UNDP) jointly launched the Smart Villages project. In the village of Gokina where the project was piloted, Huawei deployed a 4G wireless network, providing broadband access to the village's 1,000 households. Now, villagers can more quickly and easily access quality healthcare resources through online consultation services. Thanks to the wider network coverage, more digital training projects are being rolled out. For example, teachers and students at the Islamabad Model School for Girls in Gokina can now access more online education resources.

Teachers and students at the Islamabad Model School for Girls in Gokina can now access more online education resources.

Security and Trustworthiness

Over the last year, we have come even closer to the digital world as emerging technologies like AI flourished and data volumes experienced explosive growth. An increasing number of industries are accelerating digital and intelligent transformation, driving new development within the real economy through deeper digital integration. The digital economy is growing rapidly thanks to digital and intelligent technologies.

However, the growing digital economy is also amplifying cyber security risks. The increasing popularity of open source has led to the outbreak of zero-day vulnerabilities, and there have been record numbers of data leaks and rampant ransomware attacks and telecom fraud. Mitigating security risks in cyberspace is increasingly difficult. Therefore, the question has now become: How can we build intrinsic security to support network operators and customers in responding to cyberattacks? How can we build data security and ransomware protection solutions to cope with the challenges standing in the way of digital transformation? How can we ensure stable information and communications services for people during natural disasters and emergencies?

Cyber security and privacy protection

Huawei has continued to make cyber security and privacy protection a top priority. We strive to tackle both the challenges and opportunities this new age presents through management transformation, technological innovation, and open collaboration. We are committed to fostering a better life for all in the future digital world by offering secure and trustworthy products, solutions, and services, and by taking concrete steps to manage related risks in our supply chain. We also share our experiences and capabilities with our suppliers and partners so that we can strengthen cyber security and privacy protection capabilities together.

Openness and transparency

Cyber security and privacy protection are common challenges for all as we stride towards a digital and intelligent world. These are challenges that all stakeholders – including governments, industry and standards organizations, and enterprises – have a shared responsibility to tackle. Huawei's cyber security principles are built upon integrity, trustworthiness, capability, accountability, openness, and transparency. Therefore, we welcome closer communication and collaboration with all stakeholders to jointly confront emerging risks and challenges during this world-changing transformation.

(For further information, see the Cyber Security and Privacy Protection section on pages 77 to 82 of this report.)

Supporting stable communications

The information and communications products and services that run on ICT infrastructure do more than just enrich people's day-to-day lives. They are also crucial for disaster relief and major event support. As an ICT infrastructure provider, Huawei's primary responsibility is to support the stable operations and services of customer networks.

In 2023, more than 6,000 of our professional engineers worked side by side with customers and partners to safeguard global ICT networks 24/7 and provide timely support for over 300 major events and disasters.

Restoring critical communications after a major earthquake in Türkiye

On February 6, 2023, a 7.8-magnitude earthquake struck the province of Kahramanmaras in southeastern Türkiye. The earthquake was felt in 10 neighboring provinces and was followed by over 8,000 aftershocks, resulting in a large number of casualties. The earthquake also damaged more than 3,000 communications sites, and this caused widespread disruption to local networks and affected the communications of 13 million people. Communications networks are a lifeline for disaster relief. It is incredibly difficult to make progress in disaster relief without access to networks.

Right after the earthquake struck, the Huawei team rushed to the affected areas and worked with carriers to recover communications services. We restored more than 1,900 sites within 72 hours after the earthquake, and over 2,500 within a week. Within a month, we restored more than 3,000 damaged sites and communications in 94% of the affected areas. We also deployed more than 100 shared sites for emergency use to support disaster relief.

Our team worked tirelessly to make the impossible possible. The Ministry of Communications and three major carriers in Türkiye praised Huawei for restoring communications and maintaining critical network access for disaster relief.

Huawei engineers work side by side with carriers to rapidly get networks back online in the affected areas in Türkiye.

Restoring networks in southern and northern China after typhoon Doksuri

On July 27, 2023, super typhoon Doksuri landed in Jinjiang, Fujian province, China, causing serious damage to the city of Quanzhou and surrounding areas. The typhoon continued to travel north and brought heavy rainfall to 14 provinces in northern China. The worst-affected areas included Beijing, Hebei, Heilongjiang, and Jilin. The rains caused water levels in dams to rise. Floods swept through villages and damaged a large number of houses and base stations.

Huawei was prepared to weather this storm. We promptly initiated the emergency assurance plan for flood seasons and tracked the movement of the typhoon. Before the typhoon made landfall, the Fujian Representative Office had several network assurance teams at the ready, and Huawei engineers stayed at carriers' network management centers to provide onsite support. Once the typhoon made landfall, the representative offices in Fujian and northern China contacted the carriers' local assurance teams and worked with them to coordinate resources for emergency repairs. The onsite engineers quickly transported diesel generators to the affected areas, repaired optical cables, and deployed drone base stations to restore communications as fast as possible. They also opened a green channel to ensure quick delivery of disaster relief supplies.

Huawei deployed more than 600 people to support the disaster relief. Our teams worked hard for more than 20 days and successfully helped customers repair more than 10,000 damaged sites, which minimized the duration of network interruptions and supported the government's rescue and relief efforts.

Huawei engineers restore communications after typhoon Doksuri.

Environmental Protection

Green and low-carbon development is becoming a global priority, and many countries see green industry development as an important tool for economic restructuring. Huawei believes that digital technology will be a key enabler of nature conservation, green development, and response to environmental challenges. We have already seen how digitalization and decarbonization can build upon each other to promote green development. And so, as part of our long-standing pledge of "Tech for a Better Planet", Huawei uses innovative ICT solutions to address climate and environmental challenges, protecting our shared home. Our solutions focus on three areas: advancing energy conservation and emissions reduction, promoting renewable energy, and contributing to a circular economy.

Advancing energy conservation and emissions reduction

We continue to take managerial and technical measures to drive green innovation and practices. We also engage with upstream and downstream partners to reduce environmental impacts and work together to build a greener supply chain. Our innovative ICT solutions can help other industries reduce their carbon emissions, and we take every responsible step that we can to minimize carbon emissions.

Promoting renewable energy

We use ICT to improve the efficiency of generating and utilizing electricity from renewable energy, drive the transition to renewable energy, and provide green power for the intelligent world.

Contributing to a circular economy

We are moving to a less resource-intensive and more sustainable mode of development. Our actions include selecting more eco-friendly materials, reducing the use of raw materials and single-use plastics, making products more durable and easier to disassemble, and improving our product recycling system.

Huawei's non-stop efforts in environmental protection have won recognition from the environmental non-profit organization CDP, who once again placed Huawei on its 2023 "Climate A List" and awarded our company the title "Supplier Engagement Leader 2023".

Advancing energy conservation and emissions reduction

For years, Huawei has worked hard to incorporate green development into strategic plans, processes, and product and business designs of different departments. We continue to make the most of resources in our products and solutions in order to minimize carbon emissions from the very beginning. We also use a systematic supplier management mechanism that includes multiple types of incentives to encourage our top 100 suppliers to implement their own emissions reduction projects. This mechanism also helps the suppliers respond to Huawei's environmental requirements so that we can work together to build a greener supply chain.

■ Digital technologies that enable industrial energy savings

We have been innovating non-stop to provide leading eco-friendly products and solutions to our customers, extract the maximum value from resources, and enable green development across industries.

"0 Bit 0 Watt" energy-saving solutions: Reducing mobile network energy consumption by 28% while ensuring a better user experience

Huawei is helping customers build green, highly efficient networks by leveraging our technical expertise in wireless network construction, including our multi-antenna, ultra-broadband, and energy-efficient equipment and our "0 Bit 0 Watt" energy-saving solutions. In 2023, Huawei's wireless solutions helped a carrier reduce mobile network energy consumption by nearly 28%.

Huawei's High-Quality 10 Gbps CloudCampus Solution: Cutting campus Wi-Fi energy use by 20%

With Huawei's green Wi-Fi solution for smart campuses, users can check network energy consumption and energy efficiency ratios in real time. The solution intelligently recommends time windows during which energy saving is possible based on tidal network traffic patterns, and implements energy saving policies accordingly. The solution, once deployed, can cut the average annual power consumption of a campus Wi-Fi network by 20%.

Huawei's FTTO solution: Cutting network energy consumption of commercial buildings by 30%

Huawei's FTTO solution replaces network cables with optical fiber, which reduces the need for facilities such as weak-current equipment rooms, air conditioners, and fire-fighting facilities. This solution can cut network energy consumption by 30%, and allows commercial buildings to deploy a single network for multiple services including office, merchant management, security, and broadcasting.

Shifting towards a greener supply chain

As a leading global provider of ICT infrastructure and smart devices, Huawei remains committed to reducing the environmental impact of our production and operating activities. As such, we have taken a series of measures and work with our partners to facilitate the shift towards a green and low-carbon supply chain. This includes initiatives in domains such as supplier energy saving management, production and manufacturing, and product logistics and transportation.

Building a greener supply chain with suppliers

Since 2011, Huawei has participated in the Green Choice initiative, which was launched by the Institute of Public and Environmental Affairs (IPE). We encourage suppliers to manage themselves better and require them to rectify all discovered problems within a designated timeframe, to ensure their compliance with environmental protection requirements. In June 2023, Huawei held its third Supplier Carbon Emissions Reduction Conference, themed "Green and Low-carbon Development for Shared Success", where attendees discussed plans for achieving green and low-carbon development.

Green manufacturing that saves energy and cuts carbon emissions

Huawei's manufacturing department prioritizes green development within its operations while maintaining high product quality. By taking measures such as green design, green packaging, and equipment and facility energy conservation, we are constantly making our production greener.

One area of manufacturing that has historically consumed vast amounts of energy is the burn-in testing conducted to guarantee product performance and reliability before mass production and shipment. Traditionally, this testing is conducted in a high-temperature burn-in room that consumes enough electricity in a single day to power a three-member household for a month. Huawei, however, has used its self-heating technologies to replace the burn-in rooms, which has slashed the amount of energy used during testing. In 2023, we used these advanced technologies to multiple ICT and digital power products, reducing our own electricity consumption by more than 300,000 kWh.

Promoting renewable energy

At Huawei, we increase the use of renewable energy in our own operations and help customers generate green power. By the end of 2023, our digital power solutions had helped customers generate 997.9 billion kWh of green power and save 46.1 billion kWh of electricity.

Yalong Hydro's 1-GW hydro-solar hybrid power plant

In the province of Sichuan in western China, Huawei helped Yalong Hydro build the first phase of the Kela PV Plant. This hydro-solar hybrid power plant has a total installed capacity of 1 GW. The plant was connected to the grid in June 2023 and has an annual energy yield of 2 billion kWh, enough to power one million households.

The plant fully considers the needs of the local animal husbandry industry. The PV module support pillars are raised high above the ground, leaving adequate space for vegetation and grazing. The PV modules also reduce ground water evaporation, making it easier for plants to grow. This shows that synergies can be built between the PV and animal husbandry industries.

The first phase of the Kela PV Plant supports the local animal husbandry while generating green power.

Contributing to a circular economy

Huawei is pursuing more eco-friendly materials, more durable products, greener packaging, and less waste throughout our product lifecycles so that all resources can be efficiently used, reused, and recycled. For example, our trade-in program has helped extend the lifespans of 780,000 devices.

From design to processes: Greater synergies mean greener packaging

Huawei adopts a green packaging strategy known as "6R1D": Right packaging, Reduce, Returnable, Reuse, Recovery, Recycle, and Degradable. We aim to design packaging that provides sufficient protection for our products and has a minimal impact on the environment. We use innovative designs to reduce our use of plastics, and are continuing to explore lightweight, recyclable, degradable, and reliable green packaging solutions.

In 2023, for example, Huawei continued to improve its packaging designs and processes. We now use packaging that protects hardware during transportation and can be reused in different factories. This packaging can save about 46,000 disposable cartons every year.

Healthy and Harmonious Ecosystem

Achieving the UN Sustainable Development Goals requires the joint efforts of stakeholders such as businesses, governments, NGOs, and individuals. Businesses can apply their creativity and innovation to solve sustainable development challenges. As a responsible technology company, Huawei brings in outstanding talent from around the world and provides employees with a comfortable and inclusive workplace and ample room for growth. We are also doing what we can to develop skilled ICT workforces for local communities to facilitate digital transformation. Huawei remains committed to openness and collaboration for shared success. As such, we are working with our partners along the value chain, both upstream and downstream, to build a healthy and harmonious business ecosystem. We are also applying ICT to more industries and driving sustainable social development with our digital, intelligent, and low-carbon solutions.

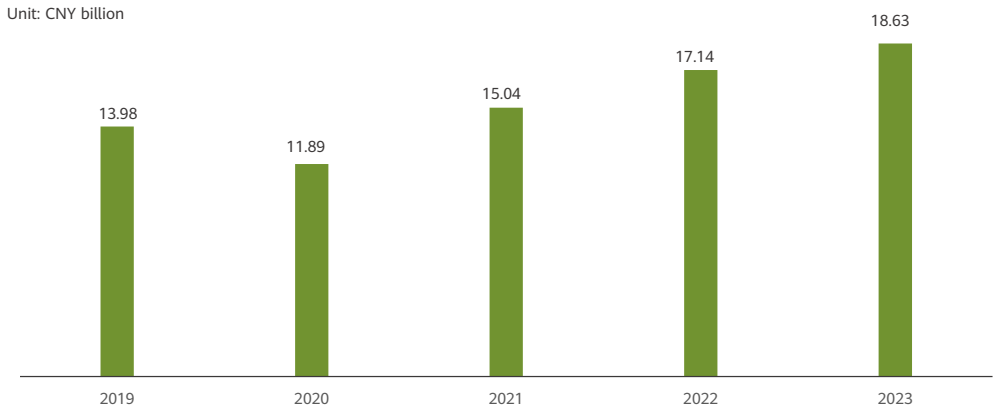
Caring for employees

Huawei takes a positive, open, and diverse approach to human resources and welcomes talent from across the globe. We provide excellent work environments and development opportunities, coupled with reasonable rewards, allowing employees to pursue meaningful and promising careers. We also publish world-class problems that help talented people unlock their potential and encourage them to explore new frontiers in a bid to drive global prosperity and social progress. In 2023, the Universum survey of the World's Most Attractive Employers ranked Huawei 22nd in the IT category, while 44 Huawei subsidiaries were recognized as a Top Employer by the Top Employers Institute.

Employee health and safety

At Huawei, it is a company policy to care for our employees and always put their safety first. We are fully committed to creating a safe, healthy workplace for all of our employees. We require all of our business domains to meet or exceed the requirements of local laws and regulations as well as those from stakeholders including governments, customers, and employees. This must be achieved in accordance with the ISO 45001 occupational health and safety management system while considering internal and external environments. We always adhere to our rules regarding occupational health and safety management, and have ensured the healthy and safe development of all business domains. We have also extended the social responsibilities associated with environment, occupational health and safety (EHS) to our supply chain. We encourage more suppliers to share the EHS responsibilities of the supply chain and drive the sustainable development of employees, the environment, and society at large.

In 2023, we continued to improve our EHS management system, which included redesigning the EHS business process architecture, making a structural update to the EHS management system manual, and driving the enforcement of EHS risk management within all business domains. In terms of safety, we provide training on the Process Safety Management (PSM) methodology to prevent risks during the design phase, which can help avoid accidents at the very source. In terms of environment, we are working to manage pollution by disposing of different types of waste in different ways and reusing waste as much as possible. For occupational health, Huawei has established a comprehensive employee health and benefits system that meets all occupational health monitoring requirements. In 2023, Huawei invested over CNY18.6 billion into employee benefits worldwide to provide employees with comprehensive social security and competitive commercial insurance.



Spending on employee benefits (2019–2023)

Huawei keeps improving working and living environments in hardship regions, with more employees moving to safe, comfortable, and beautiful accommodation.

Huawei Shanghai Representative Office won the WELL Gold rating

Huawei always strives to create comfortable and healthy workplaces that help improve employee well-being.

Huawei Shanghai Representative Office has always placed employees at the center of everything, from site selection and building design to construction and daily operations. The office has made continuous improvements based on the WELL building standard, which serves as an effective reference for improvements to workplace construction and operation standards. After one year of testing and evaluation, the office was awarded the WELL Gold rating in July 2023.

The WELL certification system is the world's first building standard to focus on enhancing people's health and wellbeing through the built environment. The WELL building standard has been developed based on scientific research across a number of disciplines such as medicine and architecture, and it focuses on ten concepts: air, water, nourishment, light, movement, thermal comfort, sound, materials, mind, and community. It serves as a guide for design, construction, and property management, and aims to improve users' health, well-being, and productivity.

Huawei Shanghai Representative Office awarded the WELL Gold rating

EHS management: Safeguarding global service delivery

In October 2023, Huawei held the Global Service Delivery EHS Conference in Dongguan, China. Over 100 EHS managers from more than 40 countries attended the conference, where they discussed EHS management and career development. During the event, recent achievements such as scenario-based EHS management methodologies and tools were released, and regional representatives shared their best practices in EHS management.

In 2023, Huawei organized more than 20 EHS training sessions for service delivery projects, including on-site training, golden seed training, lectures, and regional training, through which a total of 410 EHS professionals were certified. We have also developed and applied new tools such as a mobile applet built based on WeLink—Huawei's internal office platform—that supports onsite delivery project management and a smart helmet for safety inspection. These tools can monitor issues online, automatically generate reports, and conduct inspections by scanning codes, boosting EHS management efficiency in service delivery projects.

Huawei has won the "Zero Accident" Award from the Indonesian Ministry of Labour for nine consecutive years.

Employee training and development

Huawei offers two distinct career paths for employees: the manager path and the expert path. Employees can advance while switching between these two paths. All employees receive regular performance and career development reviews, and are given plenty of training and mobility opportunities during career development. We have implemented a mechanism for department-initiated talent transfers and an internal talent market for free mobility. Both are intended to drive employee mobility and help our employees become more versatile in multiple fields. Talented people are not confined to one domain and are instead given the opportunity to work in different professions and domains. This helps them reskill and upskill, giving them more room for growth. They also have the chance to work in different locations. At Huawei, we offer employees a global platform, exposing them to many new experiences and new insights that will help them grow quickly.

To support these two career development paths, Huawei provides comprehensive, systematic training resources and platforms to empower our employees at different stages of their careers. Our digital learning platform, iLearning, now offers over 20,000 online courses, helping our employees pursue personalized learning anytime from anywhere and supporting their reskilling and upskilling. We also have over 20,000 online knowledge communities, through which peers and experts from different domains share their experience and insights.

Our smart classroom solution supports hybrid teaching to boost efficiency. The solution offers a rich array of tools and migrates teaching resources to the cloud, aiming to bring digital to every classroom and deliver an immersive learning experience. At Huawei, we believe that the brightest minds should develop even brighter minds, so we constantly attract and cultivate excellent trainers from both inside and outside the company. In 2023, we offered employees a wide range of training activities, and employees spent an average of 63 hours in training.

New employee development

Huawei's new employee development programs take various forms, such as training, self-study, exams, certifications, mentorship, and hands-on practices. The programs include new employee orientation (NEO), delivery practice camps, learning of position-specific essential knowledge and skills, position-specific hands-on practices and mentoring, as well as assessments and tests.

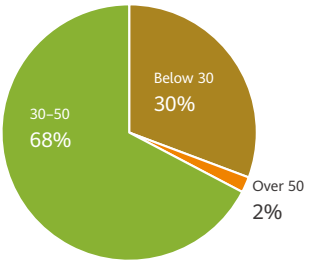
To help new employees quickly settle into their positions, we have prepared a learning syllabus and established a mentorship program. The syllabus lists the learning objectives, courses, learning instructions, and completion criteria for each new employee and each position group. This ensures that each new employee's development plan is effectively implemented and that they receive proper guidance during self-study. After years of practice and improvement, we have basically hit all the targets we set for new employee development.

A diverse and inclusive workforce

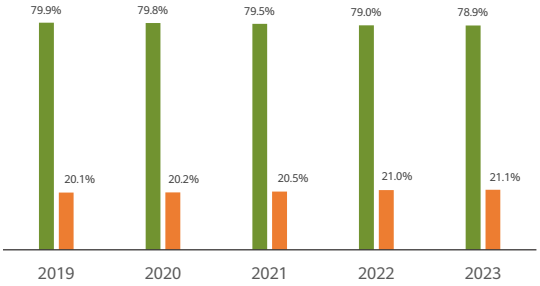
Huawei values diversity and inclusion in its workforce and is committed to creating a workplace in which all employees enjoy equal opportunities. By the end of 2023, Huawei had about 207,000 employees from 162 different countries and regions.

Huawei is committed to complying with applicable regulations such as the *Universal Declaration of Human Rights,* and our *Caring for Employees Policy* lays out the principles and requirements that we believe a good employer must meet to ensure employee care. These principles and requirements cover child labor, forced or involuntary labor, health and safety, diversity, non-discrimination, humane treatment, working hours, compensation and benefits, freedom of association, privacy protection, and learning and development. We have put in place processes, systems, and baselines to ensure that our employee care policy is effectively implemented. When it comes to hiring, remuneration, access to training,

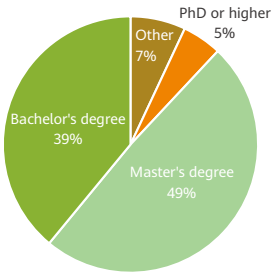
promotion, and termination or retirement, we never engage in or support any form of discrimination based on race, national or social origin, caste, birth, religion, disability, gender, sexual orientation, marital status, union membership, political opinions, age, or any other condition that could give rise to discrimination. We prohibit the use of child labor and forced labor, and have effective measures in place to prevent the recruitment and use of such labor.



Employee age (2023)



Male and female employees (2019–2023)



Level of education in 2023

We have released the *Employee Business Conduct Guidelines* (BCGs), and require every employee to sign, study, and know every detail of the BCGs. These *Guidelines* describe the legal and ethical requirements that employees must comply with when engaging in business activities. This means that Huawei employees must have a strong sense of social responsibility while complying with all applicable laws and regulations. Anyone who is found to have violated the BCGs will be subject to disciplinary action (including termination of employment and legal action if necessary).

We value diversity in our workforce and respect the lifestyles of all of our employees. We encourage our employees from different regions and departments to interact and communicate with each other in a way that suits their particular needs. We aim to create an environment that makes it easy for everyone to practice and follow their beliefs and customs, whatever they may be. For example, we have prayer rooms on our campuses, and halal food is available in our cafeterias. For nursing mothers, we provide lactation rooms. We also provide facilities like cafes, gyms, and libraries. All of these facilities help us provide quality services that meet the diverse needs of our employees.

Huawei selects its Top 10 Cafeterias and Best Offices every year and organizes a wide range of team activities to offer employees a comfortable, inclusive workplace.

We have also established employee communication mechanisms as part of our efforts to create an open, inclusive workplace that encourages mutual respect and diversity. For example, we gather our employees' opinions and suggestions through our organizational climate survey, Manager Feedback Program (MFP), the manager open day program, and more. Employees can also report violations, file complaints, and seek assistance through multiple channels such as the dedicated complaint mailbox of our Committee of Ethics and Compliance (CEC) and our HR service hotline. Huawei keeps all reporters' information strictly confidential and prohibits any attempts to threaten or retaliate against reporters.

Xinsheng Community – Huawei employees' Roman Forum

The Xinsheng Community, launched on June 29, 2008, is one of our employees' favorite internal communication platforms. It consists of several sections, including corporate files, technical exchanges, management improvement, Huawei People, and Hall of Fame.

In 2023, about 110,000 users visited the Xinsheng Community every day, including 90,000 Huawei employees and 20,000 external visitors. Everyone is encouraged to speak their mind as long as they follow the *Xinsheng Community Regulations*. Users are free to share their experiences and thoughts, and we do everything we can to protect their privacy. This helps foster a climate in which all voices are encouraged and valued.

Moving towards a diverse and inclusive world

Huawei has always valued diversity and inclusion. In 2023, we promoted the course *Cognitive Diversity Theory: Why We Emphasize Diversity and Inclusion* for HR professionals through an internal website, and pushed it to HR teams at all levels and related domains.

With this course, we want more HR professionals and managers to realize how a diverse workforce can generate greater synergy and better benefit the organization as a whole. This can encourage them to work harder to develop a more diverse, inclusive team.

Business ethics

Huawei works hard to conduct its business with integrity and conform to business ethics standards and all applicable laws and regulations. This key principle is upheld by our highest levels of management. We have worked for years to build a compliance management system that aligns with industry best practices and embed compliance management into every aspect of our business activities and processes, and these efforts continue to this day. Huawei emphasizes a culture of integrity and invests heavily to make it a reality. As such, every Huawei employee is required to strictly adhere to our *Business Conduct Guidelines*.

(For further information, see the Regulatory Compliance section on pages 70 to 72 of this report.)

Supply chain responsibilities

Huawei endorses the *UN Guiding Principles on Business and Human Rights* and is serious about the societal and environmental impact of our global procurement and supply chain. We have teamed up with customers and suppliers to further the sustainable development of our global supply chain. We have incorporated corporate social responsibility (CSR) requirements into both our Quality First strategy and activities that take place across all of our value chain. We offer premium prices to suppliers that offer higher quality in a bid to encourage them to improve their CSR performance. We have also integrated CSR requirements into our global procurement processes, from material and supplier qualification, selection, and appraisal to performance management and procurement fulfillment.

Procurement CSR management system

Huawei has established its procurement CSR management system based on the *OECD Due Diligence Guidance for Responsible Business Conduct* and the IPC-1401 *Corporate Social Responsibility Management System Standard*, and incorporated CSR requirements into our procurement strategy and business processes. We require all of our suppliers to comply with all applicable laws and regulations, and encourage them to promote diversity and improve their own CSR management by adopting globally recognized industry standards. The CSR agreements that we sign with suppliers are prepared according to the *Responsible Business Alliance (RBA) Code of Conduct* and the *Joint Audit Cooperation (JAC) Supply Chain Sustainability Guidelines*. These agreements cover labor standards, health and safety, environmental protection, business ethics, and management systems. Huawei requires that all suppliers abide by the CSR agreements and convey the same requirements to their own suppliers.

Huawei's CSR **red lines** in procurement

1. Use of child labor
2. Use of prison labor (including using prisons as suppliers or subcontractors) or forced labor (including restricting personal freedom or detaining personal identity documents)
3. Violence, physical punishment, sexual harassment, illegal body searches, cross-gender body searches, and other similar behavior
4. Salary payments below the local minimum wage
5. Negligence that leads to major fires or explosions
6. Working conditions that seriously endanger personal health and safety or lead to fatal field incidents
7. Illegal emissions of any hazardous or toxic wastes, including waste water, gas, and residue.
8. Negligence that leads to media crises or serious mass disturbances, such as collective labor disputes, mass brawls, mass poisoning, unnatural deaths, or other incidents causing casualties.
9. Unsafe and unhealthy working environments that lack effective measures to prevent potential health and safety accidents, or diseases that may be caused due to exposure in workplaces (e.g., collective infections).
10. Corruption or dishonest acts that violate the requirements of "no bribery, no gifts, no conflicts of interest, no falsification, no cutting corners, no fraud, and keeping promises".

We consider the use of child labor or forced labor to be red-line issues, and we have zero tolerance for any behavior that crosses CSR red lines. In 2023, none of our suppliers were found to have crossed any CSR red lines.

To support the strategic goal of sustainable procurement, we regularly deliver CSR training to all members of the procurement team. This training covers CSR agreements, red lines, processes, and audit practices related to CSR in procurement. CSR requirements are incorporated into the performance indicators of all teams in our procurement department.

Supplier risk rating and auditing

Huawei conducts supply chain due diligence using a risk-based approach. We work with suppliers to identify CSR risks and opportunities, and take actions to prevent and mitigate CSR risks. Every year, we assess all major suppliers, which represent 90% or more of our procurement spending, and assign each supplier one of three risk ratings (high, medium, or low). We develop an annual sustainability audit plan to deal with suppliers that are assessed as posing medium or high risk. In addition, we perform onsite assessments on all potential suppliers to examine their sustainability systems. No company that fails the assessment is eligible for consideration to become a Huawei supplier.

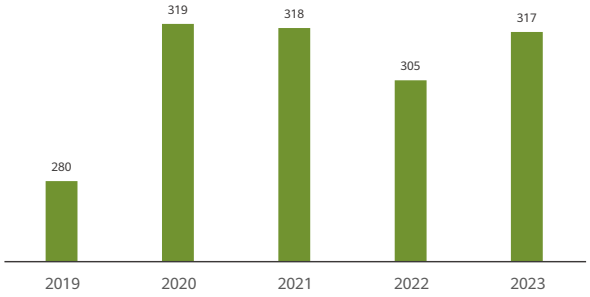
In 2023, we further refined our supplier CSR risk rating methodology. We now evaluate each supplier's CSR performance and the effectiveness of their risk prevention and management system by focusing on five criteria: CSR performance rating, health and safety risk, environmental risk, labor risk, and audit results. We pay special attention to the improvements made by suppliers posing medium and high risks.

To better meet customer requirements, we have prepared and continued to update our *Supplier CSR Audit Checklist* in accordance with industry best practices. We conduct supplier CSR audits using internationally recognized methods such as onsite inspections, employee interviews, management interviews, documentation reviews, and online searches. We also use the Blue Map database developed by the Institute of Public and Environmental Affairs (IPE) to assess supplier compliance with environmental requirements. In 2023, seven suppliers resolved identified issues within a specified timeframe with the support of Huawei.

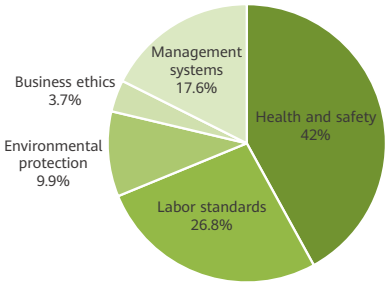
Criteria of supplier CSR risk assessment

In 2023, we assigned CSR risk ratings to over 1,600 major suppliers using the new methodology. We also conducted 317 onsite CSR audits and more than 900 onsite EHS reviews on engineering subcontractors.

If we find an issue during an onsite audit, we help the supplier resolve the issue using the CRCPE methodology (check, root cause analysis, correct, prevent, and evaluate). This methodology helps suppliers identify common problems and develop targeted solutions.



Number of suppliers on which Huawei conducted CSR audits onsite (2019–2023)



Supplier CSR risks identified in 2023 audits

Supplier performance management

Every year, Huawei appraises suppliers' sustainability performance as part of their overall performance appraisals. During this process, we also consider how they manage the sustainability of their own suppliers. Suppliers are classified into four grades (A, B, C, or D) based on their sustainability performance. In 2023, we improved our supplier sustainability performance appraisal methodology, which now looks at five criteria: environmental protection, carbon emissions reduction, labor management, EHS accidents, and management systems. In the past year, we appraised the sustainability performance of over 1,600 major suppliers.

The amount of business we do with each supplier depends partly on their sustainability performance, which is also a factor considered in our tendering, supplier selection, portfolio management, and other processes. When suppliers are equally matched in other factors, those that perform better in sustainability are given priority in terms of the share of business or business opportunities. The reverse is true for low-performing suppliers. Depending on the situation, we may instruct suppliers with poor sustainability performance to resolve existing issues within a specified timeframe. Alternatively, we may reduce their share of business or offer them fewer business opportunities. We may even terminate our business relationships with those that display exceptionally poor sustainability performance.

Supplier capability improvement

As part of our efforts to help suppliers perform more sustainably, we regularly provide them with sustainability training and coaching. We also encourage our suppliers to adopt industry best practices and embed sustainability requirements into their business strategies to reduce operating risks and boost efficiency. Furthermore, we invite leading suppliers from different industries to share their experience in dealing with risky items and scenarios such as printed circuit boards (PCBs), lithium batteries, and hazardous chemicals.

In 2023, we invited 15 industry-leading suppliers to share their best practices in EHS, and more than 500 suppliers participated in these sessions. In addition, over 600 of our suppliers' safety managers passed Huawei's online exam on production safety and red lines.

Stakeholder engagement and cooperation

Huawei maintains close engagement and collaboration with industry stakeholders. Together with the upstream and downstream partners in our supply chain, we drive CSR standardization, perform CSR-related due diligence, and make continued efforts to improve CSR management and supply resilience. We work hand-in-hand with our partners to build a responsible supply chain.

In 2023, Huawei shared information on supply chain due diligence with more than 50 customers, including that related to supply chain traceability, forced labor, and due diligence on conflict minerals. Huawei also recommended suppliers for joint audits organized by the telecom carrier association JAC. We actively participated in industry exchanges on sustainability organized by customers. Through these exchanges, we learned from the advanced management experience of customers and other vendors, and shared Huawei's best practices in supplier sustainability management. Together, we aim to develop a more sustainable value chain.

Huawei shares supplier sustainability management practices at the 5th Telecom Industry Climate Change and Circular Economy Forum hosted by a customer.

Forum on Environmental Protection and Factory Safety for PCB Companies: Improving industry awareness of production safety and environmental protection

In December 2023, Huawei and several PCB industry associations held the Forum on Environmental Protection and Factory Safety for PCB Companies, providing a platform through which industry stakeholders could share their experience in sustainability. At the event, many companies, including Huawei, shared their best practices in relation to production safety and environmental protection. These included the use of innovative technologies to achieve safe and green manufacturing and help the industry achieve sustainable development. Additionally, eight upstream suppliers shared their experience at the forum upon Huawei's recommendation.

Responsible management of minerals

Huawei is committed to and works to drive the responsible procurement of products containing raw materials, including tin, tantalum, tungsten, gold (3TG), cobalt, and mica. We have established a risk-based responsible mineral management system in accordance with the *OECD Due Diligence Guidance for Responsible Business Conduct* and the *Chinese Due Diligence Guidelines for Mineral Supply Chain*. The responsible management of minerals is an integral part of our procurement CSR management system, and has been embedded to supplier qualification, supervision, and auditing processes. As a downstream company in the mineral supply chain, Huawei does not directly purchase any

minerals, and there are at least seven tiers between Huawei and mining companies. We require that our suppliers do not purchase conflict minerals, and ask them to cascade this requirement to their own suppliers, in order to prevent or reduce the risk that minerals contained in their products may directly or indirectly support human rights abuses, harm the environment or personal health and safety, or breed corruption. Huawei also actively works with global industry peers through industry initiatives like the Responsible Minerals Initiative (RMI) and the Responsible Critical Mineral Initiative (RCI). Together with partners up and down the supply chain, we conduct supply chain surveys, create a complete list of all related smelters, and push these smelters to apply for or maintain the Responsible Minerals Assurance Process (RMAP) certification.

In 2023, in response to the RMI's call, Huawei added mica to its list of due diligence on responsible mineral management. This means that we now identify suppliers of six minerals: tin, tantalum, tungsten, gold (3TG), cobalt, and mica. According to the *Conflict Minerals Reporting Template* (CMRT) and the *Extended Mineral Report Template* (EMRT), we urge suppliers to identify and investigate all smelters within their supply chains, and our suppliers must require that no identified smelters purchase minerals from conflict-affected and high-risk areas (CAHRAs), and urge smelters that have not obtained the RMAP certification to get the certification within a specified timeframe when necessary.

For more details, visit:

Huawei Responsible Management of Minerals:
https://www.huawei.com/en/sustainability/the-latest/stories/responsible-management-of-minerals

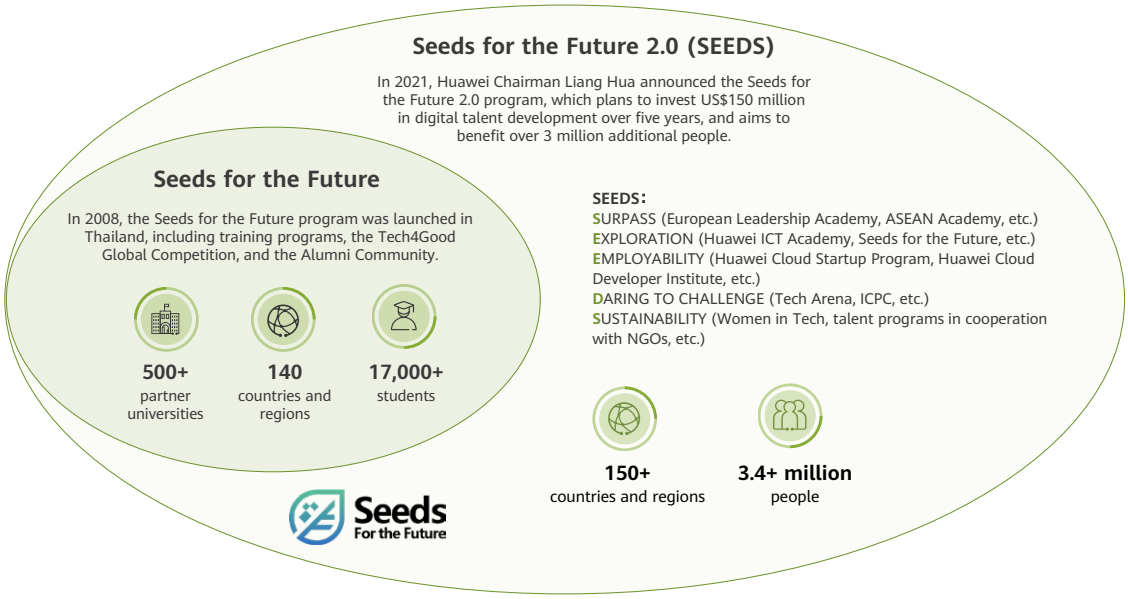
Huawei Statement on Responsible Mineral Supply Chain Due Diligence Management:
https://www.huawei.com/en/declarations/huawei-statement-on-responsible-mineral-supply-chain

Community responsibilities

Huawei actively fulfills its responsibilities to local communities. We are committed to helping local communities benefit from the digital world by providing basic connectivity and digital technologies such as cloud and AI. We work with governments, partners, and international organizations around the world to organize a variety of activities that contribute to sustainable development goals, such as innovation and infrastructure construction, ICT talent cultivation, gender equality, and environmental protection. These activities will inject vitality into local digital economies and help create fertile soil for the ICT industry in the countries and regions where Huawei operates. In 2023, Huawei operated over 300 social contribution programs worldwide.

Seeds for the Future 2.0: Cultivating ICT talent to stimulate innovation

In the digital economy, ICT talent plays an instrumental role in driving digital transformation and unleashing productivity. In 2008, Huawei launched its flagship talent development program – Seeds for the Future. In July 2021, we integrated various talent development projects across the company and officially launched the Seeds for the Future 2.0 program, which is also known as SEEDS. The program includes a range of digital talent development projects related to basic digital skills training, talent leadership, intergovernmental talent cooperation, technology competitions, and vocational skills certifications that help increase employability. The program aims to develop ICT talent in the countries and regions in which we operate and improve their abilities to use new technologies and platforms to innovate and create. The ultimate goal is to advance science and technology and drive global digital inclusion. In 2023, we held more diverse activities through the Huawei Cloud Developer Institute and ICT Academy than the previous year, benefiting developers and industry professionals around the world. By the end of December 2023, the Seeds for the Future 2.0 program had been implemented in more than 150 countries and regions, benefiting over 3.4 million people.



Tech4Good Global Competition

The Tech4Good Global Competition, which was launched in 2021 as part of the Seeds for the Future program, encourages participants to propose innovative digital solutions that address sustainability issues and create both business and social value.

At the 2023 Tech4Good Startup Sprint in China, the previous year's winning teams from Algeria, Italy, and Ireland went on field trips to see some commercial applications of digital technologies, and received guidance on their projects from startup entrepreneurs and technical experts. Following a careful review by the Tech4Good startup investment committee, the Algerian team was awarded a US$100,000 startup fund for their farm hazard warning and monitoring system. This fund created more possibilities for the team to implement their ideas and achieve business success.

At the 2023 competition, Team Namibia won the First Prize with their AI-powered teaching solution that caters to the needs of every student. The Second and Third Prizes went to Team Uzbekistan's farm irrigation optimization solution and Team Germany's drinking water purification solution, respectively. Team Brazil and Team Uzbekistan won the People's Choice Award based on public voting. The winning teams will be invited to participate in a digital tour in China in 2024.

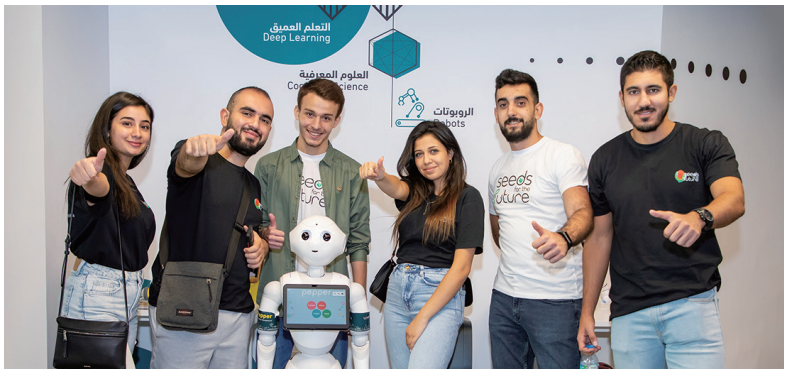
The winning teams of the Tech4Good Global Competition on their tour in China in 2023

First Seeds for the Future Global Ambassador Election

In 2023, Huawei held the first Seeds for the Future Global Ambassador Election. Voting was done online and open to the public, and the 10 alumni with the most votes became ambassadors of the program. As representatives of global Seeds for the Future alumni, the ambassadors participated in a range of activities throughout the year, including online workshops and offline industry events, as well as Huawei's flagship events and international multilateral conferences.

The ambassador from Ecuador attended MWC Barcelona to learn about the latest developments in the communications industry. The ambassador from Ireland chaired the Talent & Green Summit at COP 28 and highlighted the importance of green and sustainable development for the digital economy. The ambassador from the Philippines spoke at the Asia Pacific Digital Talent Summit, as part of Huawei's annual flagship event HUAWEI CONNECT, and discussed new ways to shape future leaders with the Executive Director of ASEAN Foundation. On behalf of global Seeds for the Future alumni, the ambassadors have promised to demonstrate their passion and skills during their year-long term to make sure that the voices of young people are heard by more people.

An online workshop with global Seeds for the Future ambassadors



In August 2023, 160-plus students from 15 countries in the Middle East and Central Asia participated in a two-week Seeds for the Future project in Qatar and the UAE. The students experienced some of the high-tech applications first-hand at Qatar's World Cup stadiums and the UAE's Sharjah Research Technology and Innovation Park. They also had the opportunity to talk with local government officials, representatives of carriers and international organizations, and startup entrepreneurs during several workshops, which gave them a better understanding of the importance of science and technology for sustainable social development.

In 2023, which marked the 10th anniversary of Seeds for the Future in Latin America and the Caribbean (LAC), outstanding Seeds for the Future alumni in the region attended the LAC ICT Talent Summit and the LAC Seeds for the Future Alumni Reunion in Colombia. They discussed the roles that youth and different organizations play in driving sustainable development and ways to fulfill their responsibilities with stakeholders from UNESCO, UN-Habitat, Huawei, and local tech firms, as well as government representatives.

Helping young talent upskill through tech competitions to advance basic sciences and the ICT industry

Huawei continues to share resources and build platforms by participating in, supporting, and sponsoring top international technology competitions, such as the International Collegiate Programming Contest (ICPC). In addition to helping young people improve their skills, we team up with academia to work on problems in basic research and industry development. Together, we share knowledge, promote innovation, and advance science and technology.

In 2023, Huawei and its partners held various competitions and training activities, such as the ICPC Training Camps, the ICPC Challenge Championship, and bootcamps. More than 50 experts from Huawei and the industry gave lectures and guided participants to hone their skills and acquire new knowledge. Within just a year, Huawei published over 50 problems for participants to work on, shared its industry expertise in multiple fields, such as software algorithms, math, physics, and materials chemistry, and maintained engagement with academia.

Huawei also collaborates with academia to build and improve research and experiment platforms and cultivate urgently-needed new talent to drive the development of new technologies in fields like devices, computing, and connectivity.

Students from around the world compete at the ICPC Challenge Championship powered by Huawei.

Making continued investment to build a thriving talent ecosystem

At Huawei, we believe that it is important to integrate industry transformation requirements into every part of talent cultivation. This includes training for teachers, students, industry professionals, and lifelong learners. We aim to cultivate high-caliber, inter-disciplinary talent with digital and intelligent skills who will promote enterprise innovation and push the industry forward. This will in turn drive greater efforts into talent cultivation, creating a positive circle.

With this goal in mind, we have worked with 2,700 colleges and universities in over 100 countries and regions to train more than one million students through the Huawei ICT Academy. We also hold the annual Huawei ICT Competition that provides an international platform for university students to compete and share ideas. The seventh Huawei ICT Competition in 2023 attracted 120,000 university students from 74 countries and regions. The Huawei ICT Academy and Huawei ICT Competition have both been listed as key partner flagship programs by UNESCO's Global Skills Academy.

In addition, Huawei continues to optimize its certification system, which covers both career and specialist certifications. By the end of 2023, we had presented over 850,000 certifications worldwide, including more than 27,000 Huawei Certified ICT Expert (HCIE) certifications. Engineers who hold our certifications are valuable resources for the digital and intelligent transformation of industries worldwide.

Huawei ICT Competition 2022–2023 Global Final Closing & Awarding Ceremony

Promoting gender equality and helping women improve digital skills

In the digital age, increasing women's visibility and engagement in tech opens up new possibilities for technological advancement and brings new value to the world.

Since 2020, Huawei has been running its Women in Tech flagship initiative, which focuses on three themes: Tech for Her, Tech by Her, and Tech with Her.

A range of Women in Tech programs have been rolled out around the world, and have already benefited many women. Through these programs, Huawei works with governments, partners, and third-party organizations to help more women improve their digital skills, provide platforms on which women can showcase their talents and capabilities, and drive a more equitable and inclusive digital world.

April 2023

Huawei and the ITU Regional Office for Asia and the Pacific organized Girls in ICT activities, including tours, field trips, discussions with experts, and training sessions on cloud, AI, and other digital skills. These activities benefited more than 60 female students aged between 18 and 25, and aimed to encourage more women to join the ICT industry.

Huawei, alongside the ITU and the National Innovation Agency of Thailand, launched a Digital Bus roadshow on International Women in Engineering Day, hoping to encourage more women to join the ICT industry.

June 2023

Huawei held the fourth session of the School for Female Leadership in the Digital Age in Spain. A total of 29 female trainees from 29 European countries participated in this training session. The program is designed to empower young female leaders and contribute to an inclusive and sustainable digital future in Europe.

September 2023

Huawei, the Greek Public Employment Service (DYPA), and local partner INTERLEI jointly delivered online training on ICT knowledge and skills for unemployed women aged 25 to 49, in order to increase their employability. The first phase of the program benefited 500 female trainees.

Huawei signed an MoU with MaMa Doing Good, a local non-profit organization in Kenya, to provide digital skills training for more than 10,000 women. Huawei also donated electronic devices needed for training, such as computers, to the organization.

Huawei partnered with Egypt's National Council for Women (NCW) to launch a Women in Tech program. The program plans to provide online digital training to 2,000 women over the course of two years to help them improve digital skills and play bigger roles in the ICT industry.

December 2023

Huawei, together with Peru's Ministry of Women, TV Peru, and a third-party non-profit organization, held the country's first awards ceremony celebrating outstanding women, where they presented awards to 21 outstanding local women working in seven different fields, and signed an MoU to continue supporting this program.

Female intern awards were presented for the first time at the Closing Ceremony of the Middle East & Central Asia Finals of the Huawei ICT Competition. A total of 31 female ICT students received certificates and earned internships at Huawei, and these internships often lead to an offer for employment.

Respecting Human Rights

Huawei believes that connectivity is a basic right for every human being. We want to build better network connectivity and provide convenient and affordable information and communications services to billions of people around the world using our innovative technologies. Ubiquitous broadband and connectivity will create jobs, promote development, decrease poverty, and improve quality of life. In addition, connectivity will help us respond to global challenges, reduce the human impact on the environment, and provide essential communications services to support rescue and relief efforts during natural disasters.

Huawei is committed to adhering to all applicable international conventions and national laws and policies, and respects all basic human rights as promoted by the *Universal Declaration of Human Rights*. We develop products and services in compliance with international standards and certifications. We strive to prevent our business activities from causing or contributing to any adverse impacts on human rights. Huawei has been a member of the United Nations Global Compact (UNGC) since 2004, and a member of the Responsible Business Alliance (RBA) since 2018. In addition, Huawei is committed to the *UN Guiding Principles on Business and Human Rights* (UNGPs) and standards released by the International Labour Organization.

Huawei's Corporate Sustainable Development Committee is responsible for overseeing any human rights risks that may exist within our business activities or supply chain, and strengthening our management of key areas that may impact human rights.

- Ensuring that technology is used to benefit humanity: Technology should be used to enhance human, social, and environmental well-being. Huawei firmly opposes any use of technology that has an adverse impact on human rights. We carefully evaluate the long-term and potential impact of our new technologies on society, based on widely recognized industry standards, throughout the design, development, and use of our products, and work hard to ensure that our products and services are used in accordance with their intended commercial purpose. To address the unknown risks that may arise from the widespread use of new technologies, Huawei has expanded its existing processes and governance programs, and we are committed to working with our suppliers, partners, and customers to manage any potential adverse impact of technology development.

- Protecting privacy: Huawei attaches great importance to privacy protection, and we take our responsibilities seriously. We are committed to complying with all applicable privacy laws worldwide, including China's *Personal Information Protection Law* and the EU's *General Data Protection Regulation* (GDPR). Huawei has embedded privacy protection requirements into our corporate governance and every phase of our personal data processing lifecycle. We follow the principles of privacy and security by design and by default and conduct privacy impact assessments before the release of any product or service, paying careful attention to sensitive personal data and sensitive usage. Huawei also requires its suppliers to comply with requirements for personal data protection. In addition, Huawei requires all of its employees to receive privacy training to enhance their understanding of the domain, and we encourage our employees to participate in professional privacy certification programs. More than 500 Huawei employees have been certified by the International Association of Privacy Professionals, placing Huawei among the top companies globally in this regard.

- Safeguarding labor rights: Huawei supports and protects the rights of its employees through detailed, equitable regulations that cover all stages of an employee's relationship with the company, including recruitment, employment, and exit. We are committed to providing equal opportunities to all employees. When it comes to employee recruitment, promotion, and compensation, we do not discriminate against anyone on the basis of race, religion, gender, sexual orientation, nationality, age, or disability. We prohibit all use of forced labor, whether overt or covert, and all use of child labor.

- Maintaining a responsible supply chain: Huawei has established a CSR management system for procurement in accordance with the UN's *Guiding Principles on Business and Human Rights* and the *OECD Due Diligence Guidance for Responsible Business Conduct*. The CSR agreements that we sign with suppliers are prepared according to internationally recognized industry standards such as the *Responsible Business Alliance Code of Conduct*, the *Joint Audit Cooperation Supply Chain Sustainability Guidelines*, and the *IPC-1401 Corporate Social Responsibility Management System Standard*. During this process, Huawei also works closely with its supply chain partners, both upstream and downstream. In addition, we comply with our customers' sustainability requirements and conduct joint audits with them. We also require our direct suppliers to cascade our requirements to their sub-tier suppliers, asking them to respect the rights of

their employees and comply with all legal requirements regarding environmental protection, health and safety, privacy, and anti-bribery compliance. Together, our goal is to create a responsible supply chain. Huawei has a comprehensive qualification process for all new suppliers, and carries out risk-informed annual audits on current suppliers. All suppliers are evaluated based on their sustainability performance, the results of audits, and the completion of any corrective actions. Huawei has a zero-tolerance policy towards the use of forced labor. If a supplier is found to have violated this policy, we will take disciplinary action against them, such as terminating our business relationship. To date, no use of forced labor has been discovered among our suppliers.

Respecting human rights has been a long-standing focus for Huawei. While remaining committed to observing applicable laws, regulations, and standards, we actively communicate with international organizations, governments, and industry institutions to develop human rights standards and guidelines for the use of new technologies. At the same time, we will continue to optimize management mechanisms and work with our suppliers, partners, and customers to promptly identify, manage, and mitigate any human rights risks or adverse impacts.

For more details about sustainability at Huawei, visit: https://www.huawei.com/en/sustainability/sustainability-report

Abbreviations, Financial Terminology, and Exchange Rates

Abbreviation	Full Name
3GPP	3rd Generation Partnership Project
AC	Audit Committee
ACM	Association for Computing Machinery
ADN	Autonomous Driving Network
AI	Artificial Intelligence
AII	Alliance of Industrial Internet
aPaaS	Application Platform as a Service
API	Application Programming Interface
AR	Augmented Reality
ARPU	Average Revenue Per User
BCGs	Business Conduct Guidelines
BG	Business Group
BOD	Board of Directors
CAGR	Compound Annual Growth Rate
CC	Common Criteria for Information Technology Security Evaluation
CCSA	China Communications Standards Association
CFO	Chief Financial Officer
CPU	Central Processing Unit
CSR	Corporate Social Responsibility
DC	Data Center
DOU	Dataflow of Usage
EAL	Evaluation Assurance Level
ECC	Electronic Communications Committee
EHS	Environment, Occupational Health and Safety
EMEA	Europe, the Middle East and Africa
ESS	Energy Storage System
ETSI	European Telecommunications Standards Institute
EV	Electric Vehicle
FBB	Fixed Broadband
FTTH	Fiber to the Home
FTTO	Fiber to the Office
FTTR	Fiber to the Room
FVOCI	Fair Value Through Other Comprehensive Income
FVPL	Fair Value Through Profit or Loss

Abbreviation	Full Name
FWA	Fixed Wireless Access
GIO	Global Industry Organizations
GPO	Global Process Owner
GSMA	Global System for Mobile Communications Association
HD	High Definition
HDR	High Dynamic Range
HIMA	Harmony Intelligent Mobility Alliance
HMS	HUAWEI Mobile Services
IaaS	Infrastructure as a Service
ICPC	International Collegiate Programming Contest
ICT	Information and Communications Technology
IETF	Internet Engineering Task Force
IFRS	International Financial Reporting Standards
IoT	Internet of Things
IP	Internet Protocol
ISP	Internet Service Provider
IT	Information Technology
IUCN	International Union for Conservation of Nature
LAN	Local Area Network
MIMO	Multiple-Input Multiple-Output
MWC	Mobile World Congress
NAS	Network-Attached Storage
NGO	Non-Governmental Organization
O&M	Operations and Maintenance
OECD	Organisation for Economic Co-operation and Development
OPEX	Operating Expenditure
OS	Operating System
OXC	Optical Cross-Connect
PaaS	Platform as a Service
PC	Personal Computer
PCB	Printed Circuit Board
POB	Performance Obligation
PON	Passive Optical Network

Abbreviation	Full Name
PUE	Power Usage Effectiveness
PV	Photovoltaics
R&D	Research and Development
SaaS	Software as a Service
SDG	Sustainable Development Goal
SME	Small- and Medium-sized Enterprise
SSP	Stand-alone Selling Price
SUV	Sport Utility Vehicle

Abbreviation	Full Name
TCO	Total Cost of Ownership
TWS	True Wireless Stereo
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGP	UN Guiding Principles on Business and Human Rights
VR	Virtual Reality
WAN	Wide Area Network

Financial Terminology

Operating profit

Gross profit less research and development expenses, selling and administrative expenses, plus other (expenses)/ income, net

Cash and short-term investments

Cash and cash equivalents plus other current investments

Working capital

Current assets less current liabilities

Liability ratio

Total liabilities expressed as a percentage of total assets

Cash flow before change in operating assets and liabilities

Net profit plus depreciation, amortization, impairment, exchange loss, interest expense, loss on disposal of property, plant and equipment and intangible assets, and other non-operating expense, less exchange gain, investment income, gain on disposal of property, plant and equipment and intangible assets, and other non-operating income

Exchange Rates

CNY/USD	2023	2022
Average rate	**7.0884**	6.7643
Closing rate	**7.0808**	6.9533

HUAWEI INVESTMENT & HOLDING CO., LTD.
Huawei Industrial Base
Shenzhen, PRC
518129
Tel: +86-755-28780808

www.huawei.com

Download:

Printed on environmentally friendly paper.