Huawei Investment & Holding Co., Ltd.

2022 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 207,000 employees and 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.

Together, we're building for tomorrow

Together, we're laying the foundations for the digital economy and helping all industries go digital. As countries around the world buckle down for post-pandemic recovery, many have turned to digitalization and the digital economy to address socioeconomic challenges. And the results are clear: Throughout 2022, we have seen a marked increase in the adoption of digital technology and services among governments, industry organizations, enterprises, and consumers.

The world is going digital more rapidly than ever before. And as this trend gains steam, we're innovating nonstop to bring the best of digital technology and services to organizations of all shapes and sizes, helping drive the digital transformation of all industries.

Together, we're enabling green development and building a better planet with technology. Climate change has become a formidable roadblock to long-term development and well-being. Now more than ever, we need to reassess our relationship with nature and move faster towards low-carbon and green development models. Carbon neutrality has become a globally recognized mission.

We believe that technology can help make our planet a better place. Huawei is doing its part to contribute to a greener and more sustainable digital world. Together with our customers and partners, we use innovative technology to expand the carbon handprint of the ICT industry, reduce carbon emissions, promote renewable energy, and foster a more circular economy.

Together, we're strengthening cyber security and privacy protection for enhanced security and trustworthiness. Network infrastructure is growing and improving every day, laying the foundations for a booming digital economy. While this opens up new possibilities in the digital world, challenges in cyber security and privacy protection are also on the rise. Addressing these challenges is an ongoing process, one that requires concerted effort from all stakeholders.

Cyber security and privacy protection are Huawei's top priorities, commitments that are above and beyond any commercial interests. We continue to maintain a solid track record in cyber security, and

our efforts have earned widespread recognition in over 170 markets around the world, where we serve more than three billion people. Customer trust is the most solid testament to the security and quality of Huawei's products and services.

On the industry front, Huawei firmly believes that openness and collaboration lead to shared success. We actively engage with the ICT industry, working with our peers and industry stakeholders to share best practices in cyber security and privacy protection. In 2022, we submitted nearly 300 cyber security standards proposals to 3GPP and GSMA. Working side-by-side with stakeholders all along the value chain, we are innovating together to bolster the industry's cyber security and privacy protection capabilities. Together, we are building a more secure digital world.

Together, we are cultivating digital talent to bridge the digital divide. Digital talent plays an instrumental role in driving digital transformation and unleashing digital productivity. We're working hard to build digital skills in the countries and regions where we operate. Back in 2008, Huawei launched a program called Seeds for the Future to help universities foster the next generation of digital talent. Through this program, we're also helping upskill industry and public sector professionals and nurture new tech leadership, working with local communities to build basic digital skills, and inspiring people to tackle real-world challenges in tech competitions. To date, this program has benefited more than 2.43 million people from over 150 countries.

We're working together to explore the future. We firmly support free trade, open markets, and fair competition. We're doing everything we can to drive the healthy development of global supply chains, especially in ICT. The world is changing, but our ideals and aspirations remain firm. Global integration and economies of scale make the whole world more efficient. To benefit from this, we need to work together more openly, sharing both the risks and value created by our efforts. This is the only path to shared progress and prosperity.

As a tech company, one of our greatest social responsibilities is exploring the future. We will spare no effort as we probe the endless frontiers of science and technology. We will join forces with people from around the world to break through engineering bottlenecks and limits in fundamental theories. We are committed to bringing ICT technology to each and every industry, to creating new value by helping them go digital, intelligent, and green, and to helping organizations cut their energy consumption and go low-carbon. Our ultimate goal is to bring the benefits of technology to everyone.

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Message from the Rotating Chairman

Plum blossoms tend to grow sweeter from a harsh winter's freeze. Today, Huawei is like a plum blossom. While it's true that we have considerable pressure ahead of us, we have what it takes to come out the other end – with opportunities to grow, a resilient business portfolio, a unique competitive edge, the enduring trust of our customers and partners, and the courage to invest heavily in R&D. We are confident in our ability to rise above any challenge that comes our way, laying a solid foundation for sustainable survival and development.

A challenging external environment and non-market factors continue to take a toll on Huawei's operations. In the midst of this storm, we have kept racing ahead, doing everything in our power to maintain business continuity and serve our customers. We have also gone to great lengths to grow the harvest – generating a steady stream of revenue to sustain our survival and lay the groundwork for future development.

The strength of pines is most pronounced in the depths of winter, as are the ties that bind us. Huawei would not have been able to weather such extreme difficulties without the tremendous trust and support of our customers and partners. For this, we are forever grateful.

We are also immensely proud of the Huawei team: We've managed to keep our heads above the water because we fought together, united as one. This is especially true of our frontline staff outside of China – those who have held the fort to serve our customers despite the adverse impacts of COVID-19 and external restrictions. And of course, we wouldn't be where we are today without the unfailing support of our families and loved ones as well. They're our rocks, and we are fortunate to have them at our back.

On behalf of the company, I'd like to express our sincere gratitude to all of you.

The macro environment may be rife with uncertainty, but what we can be certain about is that digitalization and decarbonization are the way forward, and they are where future opportunities lie. Faced with external volatility, we need to remain focused and stay true to our vision and mission. We need to double down on our commitment to building the foundations of the digital economy and to driving green and sustainable

development. By doing this, we can create greater value for our customers, partners, and society at large.

2023 will be crucial to Huawei's sustainable survival and development. We need to actively drive progress, keep inspiring passion across the organization, and further hone our capabilities. We need to be proactive about improving the business environment and more effectively managing risks. This is the only way we can lay a solid foundation for Huawei's future.

Helping industries go digital, intelligent, and green to unlock new growth opportunities

Countries around the world have turned to developing their digital economy as a key counterweight against economic downturn. By 2027, a growing digital economy will open up trillion-dollar addressable markets for our company. Naturally, countries at different stages of development will choose different paths as they build up their digital economy, just as different industries and organizations will choose the path that works best for their digital journey. In some cases, opting for the most advanced technology is not necessarily the best solution.

At Huawei, we put customers' needs front and center, providing them with the right technology for the right scenario, at the right time and with the right model, following the shortest route to market. For this purpose, we have established multiple integrated teams for specific industries, including finance, mining, government public services, transportation (airports, rails, roads, waterway, and ports), and electric power. We aim to become the preferred partner for industries as they go digital, intelligent, and green – and in doing so, we can pave the way for our own long-term growth, too.

Optimizing our business portfolio to enhance resilience

We continue to optimize our business portfolio, which now covers a mix of ICT infrastructure, smart devices, Huawei Cloud, digital power, and intelligent automotive solutions, backed by technological support platforms like our 2012 Laboratories and HiSilicon. This portfolio includes a mix of our well-established business domains and a handful of more pioneering domains. Some are developing stably while others are growing rapidly. Some rely on advanced process technology and others don't. Some are hardware-centric while others are software-centric. Together, they constitute a resilient business portfolio in terms of both structure and potential, forming a solid basis for Huawei's sustainable survival and development.

Strengthening synergy between chips, software, hardware, devices, networks, and clouds to hone our unique competitive edge

Through years of concerted effort, we have built relatively strong competitiveness in our business domains, and we have good reason to believe we'll maintain this edge for the foreseeable future. But given our inability to access advanced process technology, we need to keep exploring ways to further enhance the long-term competitiveness of our products and services.

Huawei has the most comprehensive set of technologies in ICT, and this is our unique advantage. Moving forward, we will step up integrated innovation across tech domains – namely chips, software, hardware, devices, networks, and clouds – to ensure every bit of data can be collected, transmitted, processed, and presented in an optimal way. Delivering the simplest possible architecture, highest possible quality, lowest possible costs, and a superior experience is our goal.

We are working hard to optimize network performance, energy consumption, cloud resource utilization, cloud application performance, O&M efficiency, and service capabilities. And we will continue to optimize user experience for devices and intelligent vehicles. In these ways and more, we are creating new value for our customers. And it's through these efforts that we will keep honing our competitive edge, bolstering the leadership of our products and solutions well into the future.

Succeeding through quality and making Huawei synonymous with high quality in the ICT industry

With external restrictions as our new normal, it's more important than ever that we commit ourselves to making Huawei synonymous with high quality in the ICT industry. Quality is our path to victory. To continuously create value for customers, we need to further strengthen total quality management based on ISO 9000 standards, and implement strategy-driven, all-hands, and full-process quality management across our entire value chain in alignment with our customers' needs.

To build a truly end-to-end quality management system, we need to progress along two end-to-end tracks, with one being customer-driven (from customer needs to customer satisfaction) and the other being strategy-driven (from strategy development to strategy execution). Essentially, we need to tightly incorporate quality requirements into all business processes, and provide our customers with high-quality products and services. This will help us build and maintain trust, and ultimately become their partner of choice.

These quality requirements don't stop at products, services, and contracts, but also cover cyber security, safety, and operational compliance. In addition, we need to extend our quality management mechanisms and requirements to every part of the supply chain that we've restructured over the past few years. We need to invest more, and improve quality together with our suppliers in order to deliver high quality to our customers.

Investing heavily in R&D to ensure a high level of business continuity and enhance product competitiveness

Our business continuity touches on multiple aspects, including the continuity of our supply, product development, manufacturing, and IT systems. Through years of hard work, we have made significant progress in component replacement and board redesign, as well as in operating systems, databases, product development tools, CRM, ERP, PDM, and MES. In these areas, we have what's needed to keep going, but there are still gaps in terms of leadership, ease of use, and long-term sustainability.

Going forward, sustaining – even increasing – R&D investment in these areas will be crucial for us to ensure a high level of business continuity and fuel nonstop innovation. Our efforts to reshape architecture, strengthen systems engineering, and optimize design will take the competitiveness of our products to new heights. As long as we maintain a high level of business continuity and continue to deliver competitive products, we can ensure Huawei's sustainable survival and development.

Plum blossoms tend to grow sweeter from a harsh winter's freeze. Today, Huawei is like a plum blossom. While it's true that we have considerable pressure ahead of us, we have what it takes to come out the other end – with opportunities to grow, a resilient business portfolio, a unique competitive edge, the enduring trust of our customers and partners, and the courage to invest heavily in R&D. We are confident in our ability to rise above any challenge that comes our way, laying a solid foundation for sustainable survival and development.

Xu Zhijun
Rotating Chairman

Business Highlights in 2022

Driving Ubiquitous Connectivity

- We have worked with carriers and partners worldwide to accelerate digital transformation and facilitate customers' business success in the 5G era. At the end of 2022, the number of 5G users across the globe exceeded one billion. 5G networks built by Huawei continue to deliver leading experiences. Huawei has also worked with industry partners to define 5.5G and drive the connectivity industry forward.
- We help carriers build cutting-edge all-optical networks that offer ultra-high bandwidth, ultra-low latency, and high reliability, realizing fiber to everywhere and OTN to every site. At the 2022 Broadband World Forum, Huawei's SingleFAN Pro solution won the Outstanding FTTH Solution Award.
- In remote rural areas, Huawei's RuralLink solution simplifies network deployment by eliminating the need for equipment rooms, fiber cables, and mains power. We are committed to collaborating with carriers and industry partners to connect the unconnected and bring the benefits of mobile broadband to everyone.

Enabling Pervasive Intelligence

- We are committed to accelerating the digital and intelligent transformation of industries by developing the computing industry around Kunpeng and Ascend. Kunpeng features general-purpose computing capabilities while Ascend targets AI computing capabilities. We work with our partners to drive the computing industry forward and foster a vibrant ecosystem. To date, more than 5,200 partners and 3.1 million developers have joined the Kunpeng and Ascend ecosystems, and more than 14,000 solutions have been certified.
- Huawei Cloud has launched DevCloud, which integrates the capabilities of the ModelArts AI development pipeline, the MetaStudio digital content production pipeline, the DataArts data governance pipeline, and the CodeArts software development pipeline. Together, these pipelines support collaborative development and on-demand orchestration of AI models, data, digital content, and applications. They facilitate more efficient collaboration between teams and enable agile development of intelligent applications.
- As part of Huawei's broader "Platform + Ecosystem" strategy, we are creating a digital foundation and development tools that can be used in the development of intelligent vehicles. We have brought together more than 300 partners from across the automotive industry through three ecosystem platforms: intelligent digital vehicle platform (iDVP), intelligent driving computing platform, and HarmonyOS Intelligent Cockpit platform.

Delivering a Personalized Experience

- HarmonyOS has already been deployed on 330 million Huawei devices. HarmonyOS 3 was officially launched in 2022, representing a full expansion of the Super Device feature, which is now available on 12 different device types, including smartphones, tablets, PCs, HUAWEI Vision products, earphones, smart watches, and head units, facilitating effortless cross-device interactions.

- The HarmonyOS ecosystem continues to grow by leaps and bounds. HarmonyOS Connect, the technology brand that supports the HarmonyOS ecosystem, has attracted more than 2,300 ecosystem partners and continues to add more product categories. In 2022 alone, over 181 million new devices in the HarmonyOS Connect ecosystem were shipped, covering numerous types of smart home appliances. By the end of 2022, the number of feature abilities (FAs) running on HarmonyOS-powered devices exceeded 50,000.

- Our intelligent cockpit and intelligent driving solutions have won multiple prestigious industry awards and set new industry benchmarks. Our intelligent cockpit solution, for example, won two awards at the World Intelligent Driving Challenge: Top Intelligent Cockpit Award and Extreme Challenge Award. All AITO models come equipped with HarmonyOS Intelligent Cockpit, which has been deemed one of the best head units on the market by the industry and consumers for its intuitive, intelligent, and convenient cockpit experience.

Building a Digital Platform

- We have worked with customers and partners worldwide in a bid to deeply integrate ICT technology into industries and accelerate industry digitalization. To date, we have developed more than 100 scenario-based solutions. We have also established business units (BUs) that focus on specific industries, such as the Mine BU, Smart Road, Waterway & Port BU, Government Public Services Digitalization BU, Electric Power Digitalization BU, Digital Finance BU, and Aviation & Rail BU, to rapidly respond to customer needs together with partner products and capabilities.

- Huawei Cloud continues working to provide Everything as a Service, including Infrastructure as a Service, Technology as a Service, and Expertise as a Service, aiming to help our customers unleash the power of digital faster. Huawei Cloud was recognized in Gartner's 2022 Magic Quadrant for Cloud Infrastructure & Platform Services (CIPS). The number of Huawei Cloud developers globally now exceeds 4 million.

- We have launched multiple programs like the Huawei Cloud Partner Competency Program, the Kunpeng Partner Program, and the openEuler Partner Program to encourage innovation among partners. We have also worked with more than 43,000 ecosystem partners and released over 10,000 products on KooGallery, in addition to certifying more than 12,000 Kunpeng application software solutions and over 2,000 innovative Ascend solutions. These solutions and services are currently deployed in a number of core industries including government, finance, energy, transportation, manufacturing, healthcare, and education.

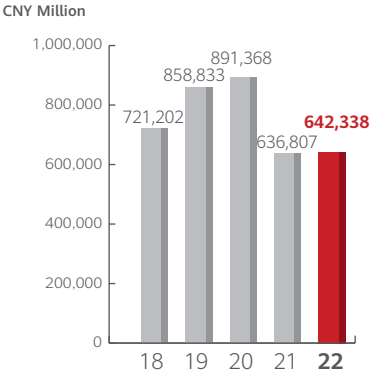
Five-Year Financial Highlights

	2022		2021	2020	2019	2018
	(USD Million)	(CNY Million)	(CNY Million)			
Revenue	**92,379**	**642,338**	636,807	891,368	858,833	721,202
Operating profit	**6,071**	**42,216**	121,412	72,501	77,835	73,287
Operating margin	**6.6%**	**6.6%**	19.1%	8.1%	9.1%	10.2%
Net profit	**5,114**	**35,562**	113,718	64,649	62,656	59,345
Cash flow from operating activities	**2,560**	**17,797**	59,670	35,218	91,384	74,659
Cash and short-term investments	**53,709**	**373,452**	416,334	357,366	371,040	265,857
Working capital	**49,608**	**344,938**	376,923	299,062	257,638	170,864
Total assets	**152,993**	**1,063,804**	982,971	876,854	858,661	665,792
Total borrowings	**28,353**	**197,144**	175,100	141,811	112,162	69,941
Equity	**62,859**	**437,076**	414,652	330,408	295,537	233,065
Liability ratio	**58.9%**	**58.9%**	57.8%	62.3%	65.6%	65.0%

Note: Converted into United States dollars ("USD") using the closing rate at the end of 2022 of USD1.00 = CNY6.9533

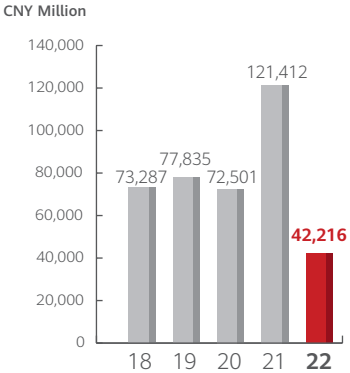
Revenue

CAGR: (3)%



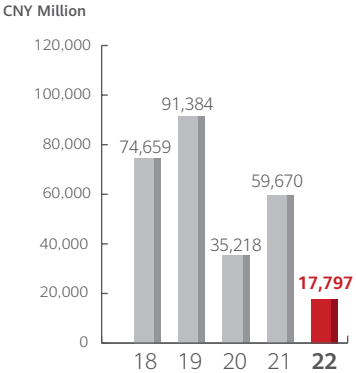
Operating profit

CAGR: (13)%



Cash flow from operating activities

CAGR: (30)%



Message from the Chairman

In 2023, we will continue to maintain strategic focus and strengthen R&D investment. Working with our global partners, we will focus on creating greater value for our customers, partners, and society as we continue to prime the pump for sustainable survival.

Forging ahead together to ensure sustainable survival

In 2022, it was all hands on deck as we rose to meet all kinds of challenges. Working together, we managed to achieve our business goals, and our overall business performance was in line with forecast.

I would like to take a moment to thank our customers, partners, and other stakeholders from all over the world for your ongoing trust and support.

Over the past year, we have maintained focus on our core businesses, strengthened investment, and buckled down to address key challenges. We also worked to enhance our competitiveness through architectural innovation and systems engineering. Our ICT infrastructure business maintained steady growth, and we achieved rapid growth in new business domains like digital power and Huawei Cloud. We also improved consumer experience and took the competitiveness of our intelligent automotive components to new heights. All the while, we have worked hard to promote digital inclusion and drive green and sustainable development.

In 2023, we will continue to maintain strategic focus and strengthen R&D investment. Working with our global partners, we will focus on creating greater value for our customers, partners, and society as we continue to prime the pump for sustainable survival.

Building an intelligent world together to drive social progress

As an intelligent world fast approaches, digitalization, intelligent transformation, and decarbonization are key pathways to sustainable development.

We predict that, by 2030, the world will be crisscrossed with hundreds of billions of connections and demand for 10 Gbit/s home broadband will be commonplace. Intelligent electric vehicles will go mainstream in the automotive industry, and renewables will account for more than 50% of global power capacity. By 2030, AI will be adopted at scale, driving increased demand for computing power and network capacity.

As this transformation unfolds, digital infrastructure for individual users, homes, and industries will face an unprecedented set of new demands. At Huawei, we will keep delivering on customer needs while pushing the limits of science and technology as we work to better serve the world.

Enabling industry digitalization to speed up the arrival of an intelligent world. The fast-growing digital economy – underpinned by digital and intelligent technologies – has become a key driver of socioeconomic development. 5G, cloud computing, and AI are seeing broader, more rapid deployment. And they are converging fast, driving the digital transformation of industries like energy, transportation, and manufacturing. This can create business value through huge gains in productivity and efficiency, while also creating social value by enabling safer working environments.

2022 saw the rapid adoption of 5G in vertical industries, with more than 20,000 innovative 5G applications put into use.

In coal mines, 5G is enabling remotely controlled operations, allowing miners to step out of the pits and work in offices above ground. This has greatly improved working conditions and mining safety.

In ports, 5G and autonomous driving are enabling automatic and intelligent loading, unloading, stacking, and more. This is making ports safer and more efficient.

In manufacturing, 5G and AI are used to identify product defects during quality inspection, which helps significantly reduce demand for manpower and make the manufacturing process more efficient.

As for sustainability, green and low-carbon development has become a globally recognized mission. 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.

We are actively building sustainability into corporate governance and the entire lifecycle of our products. We are also using innovative technology to help industries reduce their energy consumption and carbon footprint, ultimately paving the way to a more circular economy.

In 2022, we continued efforts to build a greener supply chain. In particular, we worked with our top 100 suppliers to collect statistics on carbon emissions and implement emissions reduction projects. In addition, we worked closely with our customers and partners in transportation, energy, construction, and other industries to explore how digital technology can be used to accelerate the shift towards a green and low-carbon world.

Deeper integration of the digital economy and the real economy will further enable digital transformation and low-carbon development across industries. This, in turn, will promote global economic stability, fuel green and sustainable development, and speed up the arrival of an intelligent world.

Promoting digital inclusion for a better world. Digital technology plays an important role in every aspect of our lives. It can be used to promote health, drive social development, and protect the environment. Our goal is to create a positive impact with innovative technology and bring the benefits to everyone.

For more than 30 years, Huawei has committed itself to pushing the boundaries of ICT and promoting its global adoption. By working closely with carriers around the world, we have built over 1,500 networks

that connect over three billion people in more than 170 countries and regions.

In China, we have helped carriers expand the coverage of high-speed mobile networks, making 4G and even 5G networks accessible in every village.

In Indonesia, we have worked with carriers to connect the archipelago, bringing remote island communities into the digital fold.

In Nigeria, we have helped save lives by building a digital health platform that facilitates the delivery of emergency medical supplies like blood and oxygen to people in urgent need.

In Bangladesh, we are helping make mobile payments more accessible to drive financial inclusion, bringing a broad range of banking services to the previously unbanked.

In Italy, our AI- and cloud-based acoustic monitoring systems are protecting a wetland in Grosseto, an oasis that is home to more than 300 species of birds.

In 2022, Huawei announced its pledge to the ITU's Partner2Connect alliance, under which Huawei's ICT products and solutions will help bring connectivity to about 120 million people in remote areas in over 80 countries by 2025.

In addition to connectivity, we are working to drive broader digital inclusion through our TECH4ALL program. As of the end of 2022, our TECH4ALL education programs have helped over 220,000 people build new digital skills, including unemployed youth as well as students and teachers from over 600 schools. Each month, the accessibility features on Huawei devices allow more than 4.4 million users with visual impairments and over 800,000 users with hearing impairments to use digital technology more seamlessly.

Growing together with partners through ongoing innovation

With an unwavering focus on research and innovation, we are working with our partners worldwide to probe the frontiers of science and technology. Together, we want to drive innovation and create greater value for all industries and society.

In 2022, our R&D spend was about CNY161.5 billion, about 25.1% of the company's annual revenue. Our total R&D investment over the past decade amounts to more than CNY977.3 billion.

We have set up 86 tech labs around the world that dive deep into fundamental theories and core technology systems. In the wireless network domain, we are working with the industry to define the vision and roadmap for 5.5G and promote its adoption, further advancing evolution of ICT infrastructure. In AI, we have launched the OptVerse AI Solver that helps solve complex high-dimensional optimization problems across a wide range of scenarios.

In software, we are working with partners to create thriving open source ecosystems around openEuler and OpenHarmony, with the aim of better adapting to future computing scenarios while offering the world more options for operating systems.

As part of our broader collaboration efforts, we actively engage with universities and research institutes around the world, where we work together to address our industry's toughest challenges and drive scientific and technological progress.

In 2022, we officially launched the Chaspark website, an open platform for academic exchange. This website has attracted more than 120,000 users, including many professors and experts in their fields. Huawei has distilled a number of real-world industry problems into scientific challenges, and has made them publicly available for joint exploration. Through this platform, we want to explore new models for collaboration in science and technology.

We first released *Communications of Huawei Research* in June 2022, a journal that shares views and findings in various domains of scientific exploration. To date, this journal has covered research results from more than 170 Huawei scientists and non-Huawei researchers.

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 around the world will help forge a secure, reliable, competitive, and healthy value chain.

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

A robust corporate governance system is the cornerstone of sustainable development. In 2022, we continued to build up and optimize our corporate governance system. Our Board of Directors held 11 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.

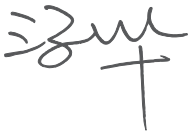
In March 2023, the Representatives' Commission elected a new Board of Directors, which will lead the company forward, focus on corporate strategies, development directions, and value creation, and support the company's sustainable survival and development.

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. These efforts continue to this day.

In 2022, Huawei continued investing resources to enhance our compliance programs across multiple business domains, including trade, finance, intellectual property, cyber security, and data and privacy protection. We value and 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 strengthen mutual understanding and trust.

The road ahead is long and hard. But no matter how bumpy that road may be, we are confident that things will gradually get back on track. We are confident in our ability to navigate challenges and improve the quality of our operations to ensure sustainable survival and development. We will stay the course and stick 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

An Intelligent World Is Fast Approaching

Decarbonization, digitalization, and intelligent transformation: Key pathways to sustainable development

Population demographics and energy trends have a direct impact on where the world is heading. Needless to say, they represent two of the most serious issues of our time. The United Nations reports that the world's population is aging, and virtually every country in the world is experiencing labor storage to varying degrees. At the same time, global energy consumption is on the rise, and fossil fuels continue to dominate the energy mix. Accelerating the transition towards renewable energy is a pressing challenge – one that is crucial for sustainable development.

At Huawei, we believe that decarbonization, digitalization, and intelligent transformation are key pathways to sustainable development. In our Intelligent World 2030 Report, we laid out our predictions for what the world will look like in 2030:

- Renewables will account for more than 50% of global power capacity.
- Electric vehicles will become predominant in the automotive industry, accounting for over 50% of new vehicles sold.
- Information and communications technology (ICT) will play a greater role in helping industries boost their energy efficiency, with the potential to cut global carbon emissions by 20%.
- Over 90% of infrastructure will run on the cloud, and more than 85% of all software will be offered as a service.
- Intelligent robots will serve more than 18% of homes.

Moving forward, technology will continue to evolve at lightning speed, ushering us into an intelligent world.

New demands for digital infrastructure

In an intelligent world, immersive communications services like extended reality (XR) and holographic communications will become the norm for individuals, paving the way for multi-sensory connectivity that defies the confines of time and space.

Households will require 10 Gbit/s all-optical networks that underpin a wide range of new services, including holographic education, holographic conferencing, 24K video, 3D media, and VR gaming.

Industries will reinvent their production models with digital technology and harness the power of AI to support all production processes.

New trends will surface on other fronts too. Citizen development will become more prevalent. Cloud application ecosystems will flourish, especially those centering on 3D media, robots, Web3, and non-fungible tokens (NFTs). Repetitive or even dangerous tasks will be relegated to intelligent machines. Vehicles will become a mobile third space outside the home and workplace, providing new options for leisure, relaxation, and private time. Renewables will also come into wider use.

The pursuit of a better experience knows no bounds. At Huawei, we are working to push the boundaries of what's possible and lay the foundations for a better future. Specifically, we want to help people exceed their biological limits and further enhance perception. We aim to break through the efficiency bottlenecks of general-purpose computing and develop new models of computing. We are working to transcend physical limits to provide a truly immersive experience.

A magnificent intelligent world is fast approaching, and it will benefit every individual, vehicle, home, and organization.

Theoretical and Technological Breakthroughs for the Intelligent World

Our world is built on three pillars: matter, energy, and information. Together, they determine how the world works. From them, we can extrapolate what theoretical and technological breakthroughs will be needed to help build the intelligent world. Matter is the origin of existence. Energy drives motion, and information allows for connectivity. We need to keep evolving technologies that enable the generation, transmission, processing, and use of both information and energy.

We predict that, in the intelligent world of 2030, there will be hundreds of billions of connections, 10 Gbit/s broadband, a 100-fold increase in demand for computing power and storage capacity, and a more diverse energy mix with renewables accounting for more than 50%.

Based on these predictions and hypotheses, Huawei has proposed ten major theoretical and technological breakthroughs that will be crucial to building the intelligent world.

Breakthrough #1: Defining 5.5G to support hundreds of billions of diverse connections

The first breakthrough relates to connectivity. In addition to connecting people, we will also need to connect a massive number of things. The demands on these connections will be extremely diverse.

Right now, the three main use cases for 5G – namely eMBB, mMTC, and URLLC – are not sufficient for a full range of diverse IoT scenarios. For example, industrial IoT applications require both massive numbers of connections and large uplink bandwidth. That's why Uplink Centric Broadband Communication (UCBC), a use case that falls between eMBB and mMTC, is needed. There are also telemedicine applications that need ultrabroadband, low latency, and high reliability. These require Real-Time Broadband Communication (RTBC), a use case that falls between eMBB and URLLC. Vehicle-road collaboration for connected vehicles necessitates both communications and sensing capabilities, so we need another new use case as well: Harmonized Communication and Sensing (HCS).

The next evolution of 5G, known as 5.5G, will need to cover these three new use cases – UCBC, RTBC, and HCS – in addition to the current three defined for 5G. 5.5G will enable the shift from connecting everything to the intelligent connectivity of everything.

Breakthrough #2: Delivering nanoscale optics for an exponential increase in fiber capacity

Equipping 5G networks to address skyrocketing growth in connections has been a key challenge, whereas the challenge with optical networks is increasing fiber capacity. Today, a single fiber can simultaneously handle one million 4K video streams. In 2030, that same fiber will need to be able to support one million people interacting in mixed reality. This means that the capacity of a single fiber will need to exceed 100 Tbit/s, which is 10 times the current level.

To address these needs, we need to drive advancement in three areas.

- Improve optical transceiver lasers and use high-modulation components to double or triple baud rates; and create new modulation coding and algorithms to multiply capacity
- Develop new broad-frequency and low-noise optical amplifiers that support manual control for reliable, ultra-long-haul transmission
- Study dynamic controls for optical networks and transform WDM networks into synchronous systems, to improve anti-interference capabilities; and leverage computing to optimize optical resource use

Longer term, we will also need to research new fiber and optical systems, like space division multiplexing (SDM), to expand the capacity of a single fiber by 100-fold.

Breakthrough #3: Optimizing network protocols for industrial connections

Today, our networks can support tens of billions of consumer connections. By 2030, networks will need to support hundreds of billions of industrial connections. This introduces three major requirements for network protocols.

- Deterministic latency: The industry will need new network calculus theories and protocols to transform the best-effort network latency we use today into a deterministic latency that can be calculated in advance.

- Security: When all things are connected, security systems will face a barrage of new challenges. Large numbers of devices like drones, cameras, edge computing devices, and sensors will all present new security risks, and the industry will rely on intrinsic, end-to-end security frameworks and protocols to mitigate them.

- Flexibility: Some sectors will require longer IP addresses, while others will require shorter ones. In response, we need to expand IP addresses with fixed lengths and develop new Internet protocols that feature sematic and syntax flexibility.

Breakthrough #4: Developing advanced computing power strong enough for the intelligent world

If connectivity determines the breadth of the intelligent world, computing will determine its depth.

In 2030, the demand for computing power will increase 100-fold. Single-core CPU performance used to grow by roughly 50% every year, but that rate has now dropped to around 10%. It's also becoming more and more apparent that general-purpose computing is inefficient in certain domains.

Advanced computing power will be the next step, and we will see development along two distinct tracks.

- Digital computing: The transition from general-purpose computing to special-purpose computing, and then to heterogeneous computing will allow for the coexistence of multiple computing architectures like CPUs, GPUs, and xPUs.

- Analog computing: Analog computing will experience a resurgence in certain domains. For example, photonic computing will have practical application in domains like signal processing, combinatorial optimization, and machine learning. In particular, photonic computing will have huge application potential in Massive MIMO and optical communications.

Breakthrough #5: Efficiently extracting knowledge from massive multi-modal data to inform breakthroughs in industrial AI

AI will be the mainstay of the intelligent world. As it becomes more prevalent, trustworthiness and the fragmentation of AI applications are two major issues that have to be resolved.

Developing general-purpose AI models is key to addressing fragmentation. General-purpose AI systems can be trained with greater amounts of unlabeled data and larger models, and by shifting from supervised to self-supervised learning. These are prime targets for future breakthroughs.

When AI and scientific computing come together, they provide a new means of facilitating scientific research. In molecular mechanics, AI modeling can enable large-scale molecular simulation. In physics, neural networks can drive the resolution of the Schrödinger equation. In electromagnetic field simulation, neural networks can support efforts to solve Maxwell's equations. AI will underpin the new approaches, methods, and tools for scientific computing, while a rigorous scientific computing system will help make AI more explainable.

AI trustworthiness is our long-term goal. This trustworthiness is particularly important in areas involving matters of life and death, such as autonomous driving, where we must have the ability to resolve issues from relevance to causality.

Breakthrough #6: Going beyond von Neumann architecture for 100x denser storage systems

Storage capacity and performance will be the main considerations for future storage systems.

The world will need much greater storage capacity. Storage density per unit of space and energy use will need to be 100 times higher than what it is now. At the moment, existing storage media can't achieve this level of density due to limits on process technology and power consumption. To meet future demand for storage capacity, we need breakthroughs in a number of new technologies, including high-capacity and low-latency memory, ultra-large-capacity media like DNA storage and high-dimensional optical storage, and ultra-large storage space modeling and coding.

We will also need significant improvements in storage performance. In future storage systems, data access bandwidth will increase from terabits per second to petabits per second, access latency will drop from milliseconds to microseconds, and performance density will increase 100 times beyond what's currently available. But these won't be possible with traditional von Neumann architecture, where data has to be sent back and forth between CPUs, memory, and storage media.

Another obstacle relates to the bandwidth of PCIe and DDR-based busses, which won't be able to keep up with growth in network performance. To break through this performance wall, we need to move past von Neumann architecture and shift away from CPU-centric systems, exploring architectures that center on data itself.

Breakthrough #7: Merging computing and sensing to provide a hyperreal experience with multi-modal interaction

Delivering a premium user experience will be an integral part of the intelligent world. Hyperreality, or a state where the physical and virtual worlds are fully converged, will become *true reality* by 2030.

For this to happen, the virtual world will need to be integrated seamlessly with the physical world – that is, have the ability to sense and reflect what's happening in the physical world while perceiving user intent in mixed reality.

Another imperative will be to fully enable multi-sensory connectivity (hearing, sight, touch, and smell) as well as multi-modal, real-time interaction between users and hundreds of smart devices, edge computing, and cloud applications. To this end, the environment surrounding the user has to work like a super computer that combines several core elements: multi-modal sensors that collect and transmit language, touch, light perception, neural activity, and other types of information; smart applications, powered by edge and cloud computing, that accurately identify user intent; and display devices such as naked-eye 3D, holographic projection, AR contact lenses, digital smell, and digital touch.

Breakthrough #8: Creating Cloud Native 2.0 architecture to bridge digital gaps more rapidly

To achieve full-scale digital transformation, established industries need a cloud platform that supports the development, deployment, and operation of large numbers of cloud-native applications in an efficient, secure, and stable manner. Underlying this platform will need to be Cloud Native 2.0 architecture with the following features:

- Regionless and serverless architecture: Powered by distributed cloud native, this architecture will help tackle thorny issues like complex control planes, hybrid deployment across all scenarios, and unified scheduling. An architecture like this will lay the foundation for Cloud Native 2.0 platforms with unparalleled price performance.

- Grid-based fault isolation: A grid-based approach to serving cloud customers, where faults are isolated in smaller, more granular units, will be ideal for cloud regions with more than a million servers. This approach will provide 99.99% runtime availability.

- More robust support for cloud services targeting different industries: This will rely on a storage-compute decoupling architecture for full-stack converged solutions covering databases, data warehouses, data lakes, and data intelligence. Another crucial technology is AI-generated content (AIGC), which will empower innovation in domains like intelligent hubs, AI development platforms, application modernization, digital native engines, and Web3 applications.

Breakthrough #9: Enabling continuous self-monitoring for more proactive health management

As the world's population ages, there will be growing demand for chronic illness diagnosis and monitoring. Roughly 85% of deaths are currently attributed to chronic illness, and the ability to effectively treat chronic illness depends on real-time monitoring. Moving forward, medical-grade wearables will become mainstream, enabling personal health tracking functionality like non-invasive blood glucose monitoring, as well as continuous blood pressure and ECG monitoring. Compared to photoplethysmography (PPG) sensors, fiber-optic sensors can capture more accurate waveforms, generating higher-quality data for blood pressure modeling and algorithms.

Medical-grade wearables can also work with big data platforms powered by cloud and AI technologies to enable more proactive health management. And with the support of brain-computer interfaces, sEMG interfaces, and wearable robots, senior citizens will be able to more proactively manage their own health and lead happier lives.

Breakthrough #10: Creating an intelligent Internet of Energy for the generation, storage, and consumption of greener electricity

Achieving carbon neutrality has become a global imperative. And as the transition towards clean energy gains momentum around the world, it poses new challenges to traditional methods of electricity generation, energy storage, and consumption.

Building a safe, efficient, low-carbon, and eco-friendly energy system necessitates innovations in the following areas:

- Management: By integrating ICT technologies like big data, AI, and cloud with the Internet of Energy, we can build an energy cloud and energy network that enables bit-based watt management.
- Control: Using energy routers supported by power electronics technology, we can build intelligent energy network controllers that allow for bidirectional energy flow and intelligent power allocation.
- Energy storage: New storage technologies, including new electrochemical and hydrogen energy storage, will be needed to address requirements across a broad range of scenarios.
- Power electronics: New compound semiconductors – including those based on silicon carbide (SiC) and diamond for medium- and high-voltage applications, as well as semiconductors based on gallium nitride (GaN) for medium- and low-voltage applications – will be vital for more efficient and compact energy components.

An Open, Inclusive, and Collaborative Approach to Innovation: Building the Intelligent World Together

Since the dawn of time, people have always imagined what the future might hold. But with technology, we can actually get there. Driving social progress and tackling global challenges requires the wisdom of the crowd, propped up by an open, inclusive, and collaborative approach to innovation. So as an industry, we need to work more closely with universities and research institutions, informing and supporting scientific research, and presenting world-class challenges that not only confront our industry, but humanity as a whole. A collaborative approach to innovation – informed by industrial challenges and academic insight, and supported by a venture capital mindset – will pave the way for the intelligent world of 2030.

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

Building a Fully Connected, Intelligent World

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 production. 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 through gigabit 5G, optical, and Wi-Fi networks.

For governments and enterprises, Huawei works with our partners to enable digital transformation. We provide intelligent connectivity solutions, 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 5G, simplified sites, 5G core (one core and cloud-native architecture), best-in-class Wi-Fi 6, intelligent and lossless data center networks, optical cross-connect (OXC), intelligent optical network terminals (ONTs), and green data centers. We are actively collaborating with the industry to define 5.5G and drive connectivity forward. And as more industries go digital, 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.

Pursuing green development has become a global mission, and carriers are doing their part by transitioning from being simple consumers of energy to highly efficient energy consumers, producers, and enablers. At Huawei, we are committed to promoting the sustainable development of the world. We advocate the use of green ICT to enable green development, and making ubiquitous connectivity a greener possibility. To this end, we work closely with carriers to support their transition.

As energy consumers, carriers will be able to maximize energy efficiency and reduce energy consumption by enabling each watt to power the transmission of more bits.

As energy producers, carriers can take part in the energy generation and coordination process to maximize the value of their infrastructure. Specifically, they will be able to power their telecom sites, data centers, and campuses with green energy, more effectively stagger electricity usage, and build virtual power plants.

To become energy enablers amid the global transition to carbon neutrality, carriers will need to use digital technology to enable both conventional and renewable energy systems, making energy supply safer, more stable, and efficient.

Pervasive Intelligence

Data has become a valuable raw material these days, 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 many 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 by making pervasive intelligence possible. Together we will build a fully intelligent world.

In data storage, Huawei's converged, intelligent, and open data infrastructure is helping break down silos between storage, databases, and big data systems. Huawei's data management engine enables customers to integrate and optimize every step of the data lifecycle, from storage and computing to management and utilization. This helps maximize value per bit and reduce cost per bit to unlock the full potential of data.

In computing, Huawei is constantly innovating in computing systems and architectures, pushing the boundaries of engineering, and driving synergies between foundational software and hardware. Sticking to our strategy of "open hardware, open source software, partner enablement, and talent cultivation", we develop the Kunpeng, Ascend, and openEuler ecosystems as part of our efforts to bring more diversified computing power to the whole world.

In cloud services, Huawei Cloud is working to offer Everything as a Service. We are translating the company's 30 plus years of ICT know-how into a wide variety of cloud services, including Infrastructure as a Service, Technology as a Service, and Expertise as a Service. These services aim to make computing power as easily accessible as water and electricity.

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, 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, entertainment, 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 anytime, anywhere.

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 main scenarios: Smart Office, Fitness & Health, Smart Home, Easy Travel, and Entertainment. Through HarmonyOS and Huawei Mobile Services (HMS), we empower our ecosystem partners to provide consumers with a superior, intelligent experience across all scenarios.

Digital Platform

Many industries are embracing intelligent upgrade now that digital transformation has reached new levels. 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 multi-dimensional 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 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 transformation and intelligent upgrade. 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.

2022 Business Review

In 2022, Huawei stuck to its strategy of focus, remained committed to building leading solutions that help industries go digital, intelligent, and low-carbon, as well as industrial Internet platforms that support them, and ramped up investment in these domains. We continued to create value for customers, improve consumer experiences, grow with our partners, and improve the quality of our operations. In 2022, Huawei's annual revenue reached CNY642,338 million, a YoY increase of 0.9%. Our overall performance was in line with forecast.

- In the Chinese market, our carrier business maintained steady operations thanks to the continued upgrade of the nation's ICT infrastructure, including its 5G and gigabit optical networks. Our enterprise business saw healthy growth with industries going digital, intelligent, and low-carbon, and moving to the cloud at a faster rate than ever before. Our consumer business stuck to its premium quality and ecosystem-centric strategy, and provided superior experiences to consumers. Huawei's revenue from the Chinese market amounted to CNY403,999 million in 2022.
- In Europe, the Middle East, and Africa (EMEA), demand for data traffic continued to grow in emerging markets while in mature markets, ICT infrastructure (e.g., 5G and optical networks) rollout accelerated and customers increased investment. As a result of these factors, our carrier business grew steadily. Our enterprise business also grew rapidly as industries began moving faster towards digital, intelligent, and low-carbon development. Our consumer business remained focused on building out the HMS ecosystem around the world and developing converged products. Huawei's revenue from this region reached CNY149,206 million in 2022.

By customer group

(CNY Million)	2022	2021	YoY
Carrier Business	**283,978**	281,469	0.9%
Enterprise Business	**133,151**	102,444	30.0%
Consumer Business	**214,463**	243,431	(11.9)%
Other	**10,746**	9,463	13.6%
Total	**642,338**	636,807	0.9%

By industry

(CNY Million)	2022
ICT Infrastructure	**353,978**
Consumer	**214,463**
Cloud Computing	**45,342**
Digital Power	**50,806**
Intelligent Automotive Solutions	**2,077**
Other	**3,978**
Elimination	**(28,306)**
Total	**642,338**

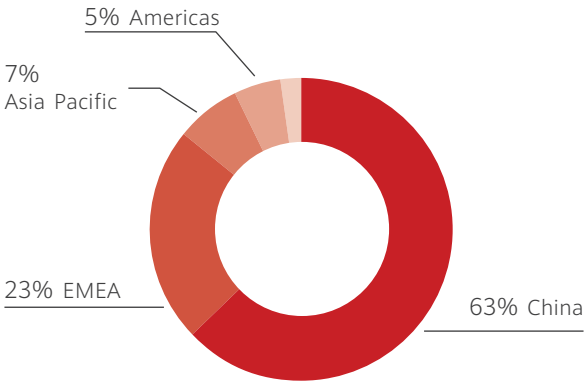
Note: In line with the changes of the corporate business management architecture, we disclosed the revenue breakdown by industry in 2022.

By region

(CNY Million)	2022	2021	YoY
China	**403,999**	413,299	(2.3)%
EMEA	**149,206**	131,467	13.5%
Asia Pacific	**48,048**	53,675	(10.5)%
Americas	**31,898**	29,225	9.1%
Other	**9,187**	9,141	0.5%
Total	**642,338**	636,807	0.9%

- In the Asia-Pacific Region, our carrier business maintained steady performance thanks to the accelerated build-out of local ICT infrastructure, including 5G and optical networks. Our enterprise business enjoyed healthy growth as companies stepped up efforts to go digital, intelligent, and low-carbon. Our consumer business continued to innovate and saw rapid growth in the HMS ecosystem, and further improved the market presence of our converged products. All of these factors resulted in a revenue of CNY48,048 million from this region in 2022.

- In the Americas, our carrier business saw steady growth as data traffic increased and customers accelerated 5G and optical network rollout and invested more into these domains. Our enterprise business grew steadily by leading digital, intelligent, and low-carbon development in multiple industries. Our consumer business continued to build out its HMS ecosystem, which saw healthy growth, and stepped up efforts in developing converged products that offer an intelligent experience across all consumer scenarios. In 2022, our revenue from this region was CNY31,898 million.



ICT Infrastructure Business

In the ICT infrastructure business, Huawei focuses on information distribution, interaction, transmission, processing, and storage to develop innovative products and solutions.

ICT technologies are at the very core of the digital economy. They are what drive industrial upgrades and the business development of enterprises. Digitalization, intelligent transformation, and green development are the way forward. With technological advances and wider application, ICT infrastructure is on course to witness greater innovation and development.

We mainly serve two markets: the carrier market and the government and enterprise market. In the carrier market, we have proposed the GUIDE business blueprint to help carriers stride faster towards an intelligent world. In the government and enterprise market, we provide digital and intelligent solutions to accelerate digital transformation across industries and create new value alongside customers and partners.

We continue to invest in two major business domains: connectivity and computing. In 2022, we proposed to the ICT industry that 5.5G is a key milestone on the path to an intelligent world, and released a series of white papers titled *Striving Towards the Intelligent World*. We also called upon the industry to coordinate efforts centered on eight facets of this vision in order to move ever faster towards the 5.5G era and the intelligent world.

For **connectivity**, our work focuses on four domains:

- Wireless network: We strive to build high-performance 5G networks and drive industry evolution to 5.5G.
- Cloud core network: We continue to build reliable network infrastructure and help carriers expand their innovative services through connectivity and service enablement.
- Optical: We focus on continuous innovation in optical transmission, optical access, and optical applications in order to drive the sustainable development of a green all-optical industry.
- Data communications: We continue to upgrade the Intelligent Cloud-Network Solution to enable digital transformation across numerous industries.

For **computing**, we focus on diversified computing and data storage and strive to build a solid computing foundation:

- Computing: We strive to develop the computing industry around Kunpeng and Ascend. Kunpeng features general-purpose computing capabilities while Ascend targets AI computing capabilities. We use an open approach and an open source strategy to create a flourishing and robust computing ecosystem.
- Storage: We continue to innovate and provide 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.

We 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 service and software domain, we build upon our more than 30 years of experience in providing ICT services and continue to innovate across the entire lifecycle of a network, from network planning, construction, O&M, and optimization to service operations. We also provide digital and intelligent services and software, develop required processes, cultivate experts, and work with ecosystem partners to build green, efficient, and robust ICT infrastructure that can deliver the ultimate experience and enable digital and intelligent transformation across industries.

Carrier Market

Over the past year, Huawei has placed customers at the heart of everything it does and worked with global carriers and partners to build simplified, green, and intelligent ICT infrastructure, all the while accelerating digital transformation and facilitating business success in the 5G era.

By the end of 2022, 5G had entered a stage of rapid development, with over 1 billion 5G users worldwide. 5G user penetration had exceeded 30% for leading carriers in a number of countries, including China, South Korea, Switzerland, Finland, and Kuwait, and over 30% of mobile traffic came from 5G networks. In addition, more than 40% of the world's 5G carriers were providing innovative 5G applications.

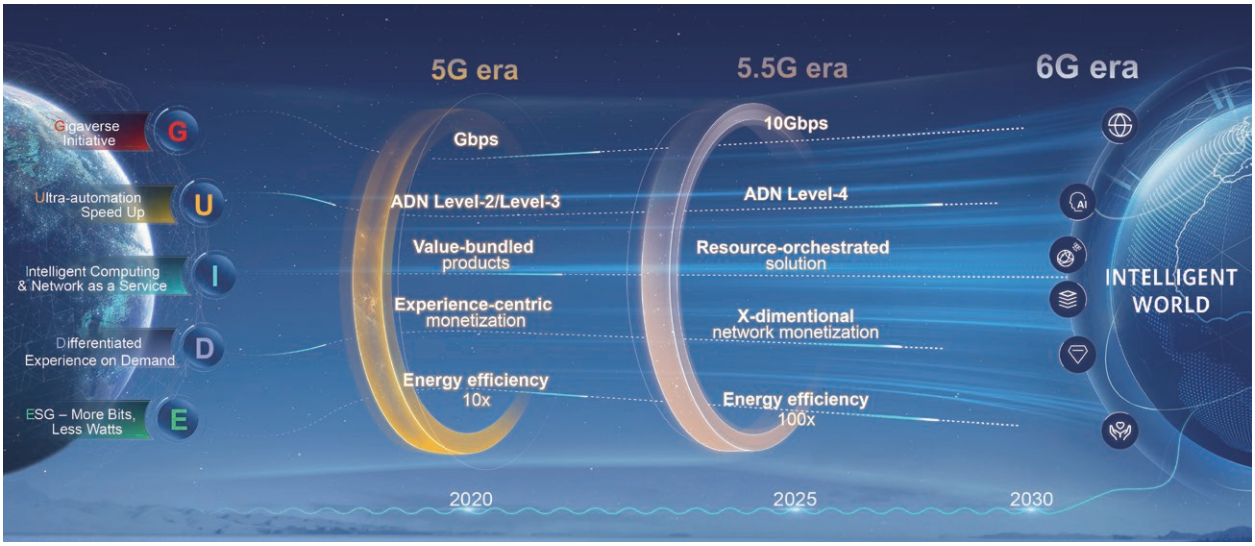
According to the latest 5G city benchmark report by Ookla, which surveyed 40 representative cities across the globe, Huawei has helped build the 5G networks of the top 10 cities ranked by 5G speed. According to comparisons of 5G performance between the carriers in these 10 cities, Huawei's 5G networks delivered the best experience.

In 2022, Huawei continued to develop a green indicator system and a systematic, innovative solution featuring a three-layer architecture (green sites, green networks, and green operations) to help carriers improve network energy efficiency on all fronts. Huawei actively participated in developing the Network Carbon Intensity Energy (NCIe) system. In October 2022, the NCIe specifications were approved by the International Telecommunication Union-Telecommunication Standardization Sector (ITU-T) as the ITU-T L.1333 standard, helping the industry more clearly and accurately evaluate the energy consumption of network services.

In 2022, Huawei and multiple leading global carriers initiated technical verification and network deployment of 5.5G and F5.5G. Huawei worked with industry partners to drive the commercial use of 5G-Advanced.

Moving forward, Huawei will work alongside global carriers to stride from the 5G era towards an even more thriving 5.5G era.

GUIDE Business Blueprint: Charting the Path to an Intelligent World



Drawing on the best practices of global carriers, Huawei developed the GUIDE business blueprint for evolving to the intelligent world. Up to now, Huawei and the majority of carriers worldwide have reached a consensus on the GUIDE business blueprint. The five dimensions of business capabilities proposed in GUIDE have been proven to be essential for carrier evolution.

- G stands for Gigaverse Initiative, meaning ubiquitous gigabit, which is extending from hotspots to every corner of the globe, creating a new level of experience and helping carriers create new paths to connectivity.
- U stands for Ultra-automation Speed Up. Ultra-automation is progressing rapidly from standardization to practical application, creating new operation models for carriers.
- I stands for Intelligent Computing and Network as a Service, which is enabling the digital transformation of factories, ports, mines, and more.
- D stands for Differentiated Experience on Demand, which is being realized for users as carriers build differentiated networks, services, and ecosystems, unleashing new potential in terms of business monetization.
- E stands for Environmental, Social, and Governance (ESG) - More Bits, Less Watts. ESG is high on global carriers' agenda and Huawei helps carriers build advanced, green, and low-carbon ICT infrastructure for sustainable development.

With tomorrow's intelligent world on the horizon, the GUIDE business blueprint maps a path for carriers to stride from the 5G era to an even more thriving 5.5G era.

Gigaverse Initiative: Ubiquitous Gigabit Accelerates Digitalization Across Industries

In 2022, ubiquitous gigabit extended from cities to countryside, from outdoor to indoor, and from living rooms to bedrooms, delivering an experience with services readily accessible anytime, anywhere. Huawei continues to help carriers build ubiquitous gigabit networks through leading 5G/F5G technologies and solutions.

Premium 5G Experience

Huawei constantly innovates in solutions that are converged, intelligent, simplified, and green, as well as applicable to all scenarios, and maximizes site and spectrum value. This helps carriers deliver a ubiquitous gigabit network experience and continuously create business value.

Long inter-site distances stand as a challenge to delivering a premium 5G experience. Huawei has deployed MetaAAU in the Asia-Pacific region, which integrates innovative technologies, such as ultra-wideband, multi-channel, and extremely large antenna array (ELAA), in order to significantly improve spectral and energy efficiency, addressing the challenges that arise in scenarios with long inter-site distances. After MetaAAU was deployed, both the download and upload speeds of users increased by around 35%, while the coverage area expanded by about 30%. More users are also choosing to use 5G networks, increasing average traffic by about 37%, and improving intergenerational performance and investment efficiency.

In Europe, Huawei coordinates the deployment of frequency division duplexing (FDD) and time division duplexing (TDD) to help carriers deliver a premium 5G experience that is consistent across both urban and suburban areas, maximizing carriers' spectrum value. Huawei pioneered the long-reach E-band microwave backhaul solution. The transmission distance increased by about 50% compared with the industry average, meeting the requirement of one-hop full coverage in urban areas and reducing the total cost of ownership (TCO) of microwave network construction in urban areas by 30% to 70%.

F5G All-Optical Network

Huawei helps carriers build cutting-edge, all-optical networks that offer ultra-high bandwidth, ultra-low latency, and high reliability, realizing fiber to everywhere and OTN to every site.

- In Europe, Huawei's 400G optical transport network (OTN) large-capacity solution helped carriers build congestion-free backbone wavelength division multiplexing (WDM) networks, which anticipate the capacity requirements of the next 10 years, with one-off investments. Huawei and carriers continuously collaborate in optical transport technology innovation, and have set an industry capacity record of 157 Tbit/s per fiber. By the end of 2022, Huawei's 400G solution had been deployed by more than 60 carriers around the world.

- In China, Huawei helped carriers build more than 30 all-optical cities using the optical cross-connect (OXC) and OTN optical-electrical converged solution, improving user experience on dual-gigabit networks and meeting enterprise customers' requirements for digital transformation.

- In Latin America, Huawei's Digital Quick ODN (DQ ODN) solution enabled carriers to quickly and efficiently build an FTTH network of 15 million lines. By the end of 2022, the solution had been deployed on a large scale in more than 120 countries and regions around the world.

- Huawei's FTTR solution helped carriers build gigabit Wi-Fi home networks. This solution offers 100% home coverage, 2 Gbit/s uplink and downlink rates, a roaming handover time of less than 20 ms, and the simultaneous intelligent connection of up to 128 devices. This solution reimagined the quality of a digital lifestyle for home users, and won the Access Innovation Award at the 24th World Communication Awards (WCA) ceremony in 2022. By the end of 2022, carriers in China, Western Europe, the Middle East, Asia-Pacific, and Latin America all began to put FTTR into commercial use.

Huawei MetaAAU has been widely used in many countries around the world, helping carriers build future-ready simplified, green, and high-performance 5G networks.

Ultra-Automation Speed Up: Laying the Groundwork for Intelligent Networks

Digitalization has reached a critical stage in industries globally. With the expansion of network scale, digitalization is now pervasive, and automation and intelligence will help carriers improve network efficiency, boost user experience, and continuously innovate their businesses. Over 90% of carriers worldwide plan to improve their network automation capabilities to L3 and L4 in the next three to five years. The proportion of investment into automation is set to increase from about 15% to about 23%. In 2022, Huawei worked with carriers to carry out automated and intelligent network operations in 13 scenarios, including wireless network, core network, optical transmission, optical access, and IP. Nearly 100 solutions have been incubated to help global carriers transform digitally.

Autonomous Driving Network (ADN)

On the road to an intelligent world, digital, automation, and intelligence are important strategic directions for carriers. This echoes Huawei's direction of key innovation for carrier networks: the autonomous driving network (ADN).

In 2022, Huawei worked with Chinese carriers to fully implement autonomous networks. To provide the ultimate customer experience, cloud-network services were automatically provisioned in minutes, and home broadband and individual services were optimized in an end-to-end, closed-loop manner. Intelligent and automatic network O&M functions, such as quick fault demarcation and location, and precise ticket dispatching, were implemented, greatly improving O&M efficiency.

In 2022, Huawei helped carriers carry out innovative ADN practices. In Europe, four applications, including efficiency improvement and energy reduction, and intelligent fault handling, were commercially deployed. In Africa, 14 applications, such as intelligent cloud-network express and premium all-optical networks, were commercially deployed, improving carriers' network O&M efficiency and core competitiveness. In Asia, 25 applications have entered trial commercial use, targeting three directions: O&M efficiency improvement, customer experience boosting, and service agility.

Digital Operations Transformation

Drawing upon the successful transformation of Huawei and its customers, Huawei launched the Digital Operations Transformation 2.0 solution and jointly released the Digital Operations Transformation Framework (DOTF) alongside industry organizations to further unleash the business value of digital transformation.

The AUTIN™ intelligent O&M solution brings digital technologies into every aspect of the O&M process and all related scenarios, and transforms O&M from being network-centric to service-centric. The solution helps carriers achieve zero perception of disruption on the user side in the case of service interruption, zero intervention, and zero code development, enabling efficient quality improvement and accelerating the transformation of O&M personnel. By the end of 2022, AUTIN™ had been applied to more than 180 projects around the world. It has been used to develop capabilities such as closed-loop event management and intelligent risk prediction, and to build an orchestration platform, improving O&M efficiency by more than 10 times.

HUAWEI SmartCare® customer experience management solution helps carriers achieve leadership in network, experience, and business through a data-driven approach. By the end of 2022, HUAWEI SmartCare® had been used in more than 200 projects worldwide. In Asia-Pacific, through the application of business intelligence (BI), revenue per site increased by about 20%. In addition, the use of data intelligence (DI) in the region increased 5G average revenue per user (ARPU) by about 10%.

Huawei's Agile Digital Operations (ADO) solution helps carriers identify issues related to home broadband user experience and service quality and implements proactive optimization, enhancing user satisfaction, continuously tapping into customer requirements, and improving marketing success rate to increase revenue through high quality. By the end of 2022, ADO had entered commercial use in more than 40 projects around the world. In China, ADO increased the average FTTR marketing success rate from 1.5% to nearly 4%.

Intelligent Computing and Network as a Service: Synergizing Cloud Computing Power and Network Capacity for the Digital Intelligence Era

Ubiquitous connectivity is the prerequisite for giving full play to ubiquitous computing power. Synergizing computing power and network capacity and maximizing resource utilization are set to become the key to carriers' new business growth in the future.

In 2022, Huawei worked extensively with global carriers on joint innovation for enterprises' cloud migration and "5G + edge computing", helping carriers develop a competitive advantage in industry digitalization.

Intelligent Cloud-Network

In the face of the digital transformation of numerous industries in the 5G and cloud era, Huawei's intelligent cloud-network is a synergy that maximizes the value of carriers' network resources and accelerates the digital, network-based, and intelligent transformation.

- In Europe, Huawei deployed the full series of universal-service NetEngine 8000 routers, and employed innovative technologies such as 400GE, SRv6, slicing, and In-situ Flow Information Telemetry (IFIT), helping carriers build integrated service bearer networks positioned for the next 5 to 10 years with the best user experience, meeting the service requirements of fast-growing traffic. In addition, the solution dynamically visualizes services, optimizes latency paths, and ensures service level agreements (SLAs), thereby improving user experience.

- In China, Huawei used the ultra-broadband ultra-stable converged backbone network architecture to help carriers build the world's largest end-to-end 400GE IP backbone network, which boasts 99.9999% reliability and smooth evolution over the next 10 years.

- In Asia-Pacific, Huawei's 1 + X solution for enterprise customers has helped carriers unify WANs and LANs. The solution consists of slicing, converged management of WANs and LANs, cloud security, and automated management. It provides end-to-end differentiated services for enterprises, protects SLA experience for mission-critical services, and doubles O&M efficiency.

+IT: Grow Together

IT infrastructure is crucial for digital transformation. Huawei provides an intelligent, reliable, efficient, and collaborative IT infrastructure foundation that allows carriers to accelerate their digital and intelligent transformation and Huawei to grow alongside carriers.

- Cloud-based transformation has become a common choice for global carriers. Drawing on over 30 years of experience in the telecom industry and extensive practices in cloud transformation, Huawei leverages its advantages in cloud-network synergy to maximize network asset monetization capabilities. "Connectivity + cloud" expands the scope of connectivity monetization, "services + cloud" accelerates service innovation, and "operations + cloud" improves operational efficiency. By the end of 2022, Huawei has worked closely on cloud-based transformation with more than 140 carriers around the world.

  - In China, carriers used Huawei's cloud-network solution to enable one-click provisioning of cloud and network services. The service rollout time of enterprise branches was shortened from over 20 days to about 3 days. In addition, carriers used the cloud-network commercial solution to expand the scope of traditional private line services, increasing the market space of business-facing services by about 20%.

  - In Asia-Pacific, carriers used the Huawei Cloud Stack one-stop solution to shorten the service rollout time of customer experience management (CEM) by more than 30%, and TCO by more than 20%.

  - In Europe, carriers used the distributed cloud pre-integrated with Huawei's telecom experience to transform their video platform to cloud native for video service development. This shortened the service development iteration cycle from two months to about two weeks, and increased the number of video service subscribers by about 10%.

  - In Africa, carriers deployed the mobile wallet platform on Huawei Cloud, shortening the service rollout time. In addition, carriers could access the Huawei Cloud ecosystem, which helped shorten the time of releasing offerings to the ecosystem from several months to about one week.

- Data is the key factor and the core asset for digital and intelligent transformation. It is vital that carriers build secure, efficient, and intelligent data infrastructure to support the evolution of data storage. Huawei launched OneStorage, a next-generation solution that is multi-cloud, secure and reliable at the system level, and energy-efficient, building a foundation for carriers' data infrastructure. By the end of 2022, Huawei had provided intelligent and efficient data storage products and solutions to more than 400 carriers worldwide.

  - In China, carriers used Huawei's separated storage-compute solution for big data services, reducing storage equipment footprint by about 85% and IT infrastructure power consumption by about 64%.

  - In Asia-Pacific, Huawei supported carriers in adopting the high-reliability, geo-redundant, core service disaster recovery (DR) solution and the industry's unique active-active data centers, which support simultaneous storage area network (SAN) and network-attached storage (NAS), achieving zero service interruption.

  - In Europe, carriers used Huawei's distributed storage solutions to meet exabyte-level data storage requirements while complying with local laws and regulations on data security.

  - In Africa, carriers deployed Huawei's end-to-end backup and anti-ransomware data storage solution. The attack detection rate reached 99.9%, with zero data loss.

MEC Innovation: Creating New Value Together with Industries

Huawei's MEC to X solution supports local-area, wide-area, and cross-domain private networks, and helps carriers enable services in all scenarios, such as education, healthcare, manufacturing, coal mining, and electric power. The solution enables the comprehensive digital transformation of industries and helps carriers achieve new revenue growth. In cross-domain scenarios, Huawei's Mobile VPN solution enables users to access public networks and campus intranets anytime, anywhere, in a secure and convenient manner. It supported a Chinese carrier in carrying out the "1,000 smart schools in 100 cities" campaign, implementing more than 200 5G projects for smart education. The solution also helped global carriers deliver a new 5G mobile office experience to over 1,000 enterprise customers. At Mobile World Congress 2022, the smart healthcare case, jointly created by Huawei and a Chinese carrier, won the Best Mobile Innovation for the Connected Human Award.

Differentiated Experience on Demand Helps Carriers Expand into New Business Spaces

In a thriving 5G era, digitalization requires personalized and differentiated connections and services such as intelligent interactive 5G New Calling, home connectivity with guaranteed experience, and private lines and private networks for industry applications. To support this, the telecom industry must build networks that are not only capable of providing a differentiated experience, but also of providing deterministic and on-demand connectivity experiences. In 2022, Huawei supported global carriers in continuous innovation, providing diversified connectivity experiences that meet the requirements of individuals, homes, and enterprise users, and realized multi-dimensional monetization.

5G Multi-Dimensional Monetization Accelerates Business Success

Since the large-scale commercial use of 5G worldwide, Huawei has helped carriers explore network potential, continuously explore the monetization of differentiated experience, and accelerate 5G business success.

- In terms of individuals, Huawei helped carriers continuously improve user experience in fields such as livestreaming, short videos, and New Calling, and stimulate user demand. Huawei's scenario-based B.E.S.T. network solution helped carriers provide a high-quality, 1080p experience anytime, anywhere and deliver leading performance, experience, and business results.
  - In Hubei, China, Huawei joined hands with carriers to provide a better 5G experience, increasing the proportion of mobile short HD videos from 77% to 83%, and stimulating the growth of 5G traffic by about 12%.
  - In Latin America, OTT experience improvement increased traffic by over 20% for carriers, boosting both market share and revenue and accelerating the positive business cycle.
- Regarding home users, Huawei supported global carriers in deploying 5G fixed wireless access (FWA) services. The combination of eMBB and FWA effectively increased the revenue per site and improved the network experience of home users. In areas where optical fibers were not available, Huawei helped carriers rapidly upgrade old copper lines in order to create a wireless home broadband experience capable of delivering over 300 Mbit/s.
  - In the Middle East, by combining FWA with dual-band time division duplexing (TDD), carriers delivered a large-bandwidth experience comparable to that of optical fibers. By bundling the broadband service with OTT TV, cloud gaming, and smart home services, carriers enjoyed an ARPU increase of 30% to 60%.
  - In Southern Africa, by combining FWA with Huawei's advantages in wireless coverage, carriers provided affordable high-speed broadband services for households. 5G FWA became the preferred access mode for 100 Mbit/s home broadband, helping carriers drastically shorten the return on investment (ROI) cycle.
- In terms of industries, 5G applications have entered a golden period. 5G has been successfully deployed across 50% of 97 major industries, including manufacturing, mining, iron and steel, port, chemical, cement, power grid, and healthcare. The total number of 5G use cases across industries has exceeded 20,000, and carriers' 5G private network service revenue increased by more than 100% year on year. 5G has become a new engine for service growth.

OTN for Premium Private Line Monetization

Huawei's OTN premium private line solution has continuously helped carriers build a competitive advantage and increase revenue. By the end of 2022, Huawei had deployed almost 100 OTN premium private line networks worldwide with carriers.

In the Middle East, Huawei helped carriers provide 4K/8K HD video private networks for audiences through OTN premium private lines, assuring highly reliable, low-latency livestreaming for multiple major international sports events.

In Asia-Pacific, Huawei worked with carriers to build a pan-Asia Pacific ultra-broadband, all-optical, high-speed network for the next 10 years. The multi-tenant portal facilitated the rapid deployment of enterprise private line services and empowered digital economy growth across the Asia-Pacific region.

XtoB: Tapping into the Blue Ocean of New Business

As digital transformation has gained momentum, Huawei has been helping carriers incubate multiple scenario-based product portfolio solutions in multiple fields, such as finance, industrial, education, healthcare, and small– and medium-sized enterprises, over the last year. This helped carriers extend their service from carrier networks to enterprises' intranets and application services, opening up new space for carrier growth in business-facing scenarios.

In the financial industry, networks are critical to ensuring transaction speed, data protection, and reliability. Huawei and Chinese carriers jointly launched a fixed-mobile convergence private line product, which increased network reliability to 99.99% and offered networks of reliable connectivity, excellent service experience, and high data security for the financial industry.

Industrial digital transformation relies on networks that are capable of multi-party collaboration, meaning higher requirements for reliability, O&M, and evolution. Huawei and Chinese carriers jointly built an F5G+5G reliable production network, which is a service-oriented converged product for small– and medium-sized manufacturing enterprises. The product leverages the mutually complementary advantages of 5G+optical fiber, delivering the dual reliability of wireless and fixed networks and ensuring zero packet loss for mission-critical services. The method of renting instead of building allows enterprises to flexibly use integrated service solutions.

Regarding campuses related to public services, such as education and healthcare, Huawei worked with Asia-Pacific carriers to launch the "5G+Wi-Fi+IoT converged campus network" solution, which focuses on converged IoT and a single network both on campus and off campus. The solution allows various IoT devices to quickly go online, giving enterprise employees quick and smooth access to services both on campus and off campus. This solution has greatly improved hospital management efficiency and the service experience of doctors and patients, helping carriers increase their revenue from smart healthcare by about 20% year on year. The solution has also ensured cloud-based teaching service experience and secure access, and doubled carriers' O&M efficiency.

For small– and medium-sized businesses, such as office buildings, roadside shops, and hotels, Huawei and carriers jointly launched a simplified and convenient one-stop ICT service. This service integrates networking and cloud services, addressing the problems presented by complex network construction and inefficient maintenance of traditional services.

Core Network: Enabling Differentiated Service Experiences and Accelerating Business Monetization

The development of mobile networks has transformed people's lifestyles. Network traffic has increased hundreds of times, new applications have emerged, and people have higher requirements on voice, data, and video experience.

Huawei worked with carriers to incubate the world's first intelligent, core-network-based dynamic experience assurance solution. This solution has implemented closed-loop assurance management, with perceivable effects, helping carriers increase ARPU, accelerate business monetization, and generate more network traffic.

5G New Calling is an upgrade for carriers' basic call services. Huawei and carriers have leveraged the real-time, multimedia communication platform to offer ultra-HD, intelligent, and interactive calling capabilities, in order to incubate new services such as visualized voice calling, real-time translation, fun calling, and AR identification. These services are applicable to numerous scenarios such as cross-language communication, assistance for those with disabilities, family interactions, and remote collaboration. Carriers have transformed their business model from voice service provisioning to video and content operation monetization, making communication more accessible and inclusive and better fulfilling social responsibilities.

Digital Service Monetization for New Business Growth

Huawei continues to innovate in digital services, enabling carriers to increase revenues and making monetization more agile. In the B2C inclusive financial market, Huawei's Mobile Money solution had served more than 20 countries by 2022. The Mobile Money solution provides one-stop mobile wallet, payment, and micro-finance services to help promote the development of the digital economy in emerging markets and make people's lives easier. Facing new business opportunities in the B2B market, the Artificial Intelligence Contact Center (AICC) improves customer service efficiency and user experience through E2E intelligence and converged HD video, upgrading the traditional customer service model. In addition, Huawei's cloud native converged billing solution (CBS) helps carriers implement service convergence and improve operation efficiency. By 2022, the new-generation cloud native CBS solution had facilitated the cloud migration of more than 20 carriers worldwide, and supported the agile monetization of their business.

ESG: More Bits, Less Watts

Moving towards an intelligent world, carriers not only provide ubiquitous connectivity and the ultimate experience for all of society, but also improve the energy efficiency of ICT infrastructure. This will drive energy conservation and emission reduction, and enable green and sustainable development across all industries through ICT technologies.

Jointly Building a Green Indicator System and Promoting Industry Consensus

In 2022, Huawei actively participated in the formulation of the Network Carbon Intensity Energy (NCIe) system and joined with Chinese industry partners to release the *Proposal for Building a Green and Low-Carbon Indicator System for Information and Communications Networks*. The parties involved jointly built end-to-end indicators for all scenarios based on network infrastructure energy efficiency.

Huawei supported a Chinese carrier in assessing the NCIe and setting energy efficiency improvement targets. Huawei also helped improve network energy efficiency in all scenarios through simplified site reconstruction, all-optical network upgrade, and MetaAAU deployment in wireless network.

Additionally, Huawei actively promoted indicator innovation. Huawei worked with European carriers to conduct the refined evaluation of wireless network energy efficiency (NEE 2.0) based on the multi-dimensional factors of energy efficiency and user experience, and deployed energy-saving solutions by different scenarios. This improved the energy efficiency of the entire network by more than 20%.

Green Site

Huawei helped carriers improve equipment energy efficiency through simplified site reconstruction, introduced photovoltaic (PV) deployment solutions to increase the proportion of clean energy and reduce carbon emissions, and built green data centers to meet the requirements of hyperscale green computing.

Huawei uses the green site solution to help carriers improve network energy efficiency, save energy, and reduce emissions.

- Highly integrated modules support simplified and efficient site reconstruction.

  In the Asia-Pacific region, Huawei's leading 8T8R solution was employed by wireless sites. Compared with traditional solutions, Huawei's solution reduced the energy consumption of a single site by about 26%, enhancing both performance and energy efficiency.

- Diversified new energy improves the utilization of green power.

  In Central Asia, Huawei helped carriers deploy more than 500 solar sites. New technologies, such as shading loss reduction and energy storage self-optimization, were used to generate an annual power volume of about 1.5 GWh, drastically reducing the carbon emissions of networks.

- Green data centers greatly reduce the carbon emissions of buildings.

  In Africa, prefabricated steel-structure modules allowed carriers to quickly build data centers, with a time to market (TTM) of less than 14 months, while the carbon emissions produced by construction were reduced by more than 60%. Furthermore, environment handling units (EHUs) were used for cooling, reducing the energy consumption of the data center by more than 20%.

Green Network

Huawei leverages all-optical for all scenarios, simplified network architecture, and network-wide intelligent energy saving to help carriers build high-quality networks that offer optimal energy efficiency and user experience.

- All-optical for all scenarios unleashes the green potential of optical fibers.

  In Latin America, synchronous digital hierarchy (SDH) networks with high energy consumption and high idle rates were retired in batches and services

were migrated to new OTN networks. Following this reconstruction, carbon emissions were reduced by 37%.

- Simplified network architecture brings ultimate energy efficiency.

  In Europe, carriers used Huawei's converged backbone solution to carry multiple services on one network, improving network energy efficiency by over 30%.

- Networkwide, intelligent energy saving helps achieve Zero Bits, Zero Watts.

  In China, the four-level OLT energy-saving solution was deployed on home broadband networks, and network energy efficiency was improved by about 59% when ultimate energy-saving mode was used.

Green Operations

Through user operations, Huawei helped carriers migrate users to networks powered by more advanced technologies. Through energy conservation policies, Huawei helped build visualized and manageable energy efficiency indicators, optimizing energy saving across entire networks.

- In terms of user operations, more energy-efficient technologies were used to support both business and user development.

  In the Middle East, Huawei helped carriers implement the 5G user migration policy, which reduced the energy consumption of a single site with a high proportion of 5G traffic by about 30%.

- In terms of energy-saving policies, network resource scheduling was intelligently optimized to reduce energy consumption.

  In Europe, Huawei provided an integrated 4G/5G energy-saving solution, reducing the energy used by equipment by around 11%. The PowerStar intelligent energy-saving solution enabled carriers to continuously reduce equipment energy consumption and has been applied to more than 50 networks around the world.

Towards the 5.5G Era

In the future, we expect that individuals, homes, and industries will pose higher requirements on ICT infrastructure. As demand for immersive services grows exponentially, carriers will need to provide users with 10 Gbit/s connection experiences. In addition, carriers need to offer highly-reliable, low-latency networks in order to meet industry requirements for digital and intelligent transformation.

In July 2022, in a bid to drive the continuous evolution of ICT infrastructure, Huawei launched the "Lighting up the 5.5G Era" initiative, joining hands with industries to move from the 5G era to an even more thriving 5.5G era. The ICT network infrastructure of the 5.5G era includes 5.5G, 5.5G Core, F5.5G, and Net5.5G. There is no doubt that 5.5G is the path towards the intelligent world of 2030.

As the 5.5G era unfolds, the network capabilities and business value it offers are becoming increasingly clear. 5.5G will improve network capabilities by 10 times and help carriers seize even more business opportunities. The number of online users of immersive services is expected to increase from 10 million to 1 billion. The global penetration rate of gigabit and higher-bandwidth home broadband will reach about 55%. The number of 5G private networks deployed by global carriers is expected to increase from 10,000 in the 5G era to more than 1 million in the 5.5G era. Furthermore, 5.5G is set to open up new business scenarios, and 5.5G passive IoT technologies will be employed by numerous industries such as warehousing, logistics, and animal husbandry, achieving 100 billion connections or more. The harmonized communications and sensing network can also be applied to road traffic and urban pipeline corridor inspection, making urban infrastructure more efficient and secure.

In 2022, Huawei worked with leading carriers and industry partners in Europe, the Middle East, and Asia Pacific to carry out joint innovation on 5.5G, F5.5G, and Net5.5G, together exploring business scenarios and verifying key technologies. Huawei joins with carriers and industry partners in working towards the 5.5G era and creating new value together.

Enterprise Market

Digital transformation is now in full swing. Huawei consistently invests in R&D and innovates in digital infrastructure, and works with customers and partners worldwide in a bid to deeply integrate ICT technology into industries. Our goal is to accelerate industry digitalization, boost the digital economy, and create new value together for all industries.

We believe that a key approach to deepening digital transformation and helping customers create value is finding the right technology for the right scenario, which also acts as a driving force behind our continuous innovation in various business domains:

- From a business domain perspective, we continue to pursue technological innovation in domains such as connectivity, computing, and cloud.
- For cross-technology synergy, we have developed 26 portfolio solutions to meet the diverse requirements of customers at different stages.
- Regarding scenario-based solutions, we work with partners to help customers overcome challenges encountered during the last mile of "finding the right technology for the right scenario". To date, we have developed more than 100 scenario-based solutions that have been adopted by numerous industries.

We have established business units (BUs) that focus on specific industries, such as the Mine BU, Smart Road, Waterway & Port BU, Government Public Services Digitalization BU, Electric Power Digitalization BU, Digital Finance BU, and Aviation & Rail BU, bringing specialized groups of experts closer to customers' business challenges and more heavily incorporating resources, including products and capabilities from partners. This aims to provide targeted solutions for each industry and allow for more rapid responses to customer needs.

Globally, we are bringing partners together and working diligently alongside partners to build a customer-centric culture and mechanism. We openly collaborate and share value with our partners to build a robust, win-win partner system that is interest-bonded, integrity-centric, and rule-based. Through these actions, we are growing together with partners and helping customers achieve business success.

A Wealth of Experience in Helping Governments and Enterprises Go Digital

Driven by business needs, and always starting out with top-level design, Huawei focuses on creating value for customers, and works with governments and leading enterprises worldwide to constantly explore and implement the best practices for industry digitalization and help customers go digital. These efforts cover numerous sectors such as smart cities, finance, transportation, energy, manufacturing, education, healthcare, Internet, and SMEs.

Smart Cities

Huawei works to help governments around the world go digital, supporting the construction of national digital infrastructure and accelerating the digital transformation of public services.

In 2022, we released the *Public Services Digital Infrastructure White Paper*, in which we proposed a "One Cloud, One Network" approach to public services to accelerate government digitalization and create social value. We have unveiled portfolio solutions targeting eight key scenarios to help customers build efficient, green, secure, and reliable digital infrastructure. We currently serve over 700 cities across more than 100 countries and regions.

In Northern Africa, we have deepened our partnership with a public service customer. By employing our portfolio solutions for the private cloud, microwave networks, data centers, and campus networks to modernize ICT infrastructure, we have helped the customer provide high-quality, sustainable social security services for citizens.

With the "City Intelligent Twins" universal reference architecture as a foundation, we coordinate multiple technologies (e.g., 5G/F5G, cloud, AI, big data, and IoT) to build new infrastructure that can act as the digital foundation of cities. Horizontally, we enable service innovation and work alongside partners to develop targeted solutions, significantly expanding adoption of digital technology for public services. In 2022, we continued to optimize Huawei's Intelligent City Governance Solution to improve service handling efficiency. The solution significantly lowered the number of complaints from citizens and reduced the burden on grassroots government workers.

Huawei helped an airport build a world-leading centralized operations and control center based on Total Airport Management (TAM). The center ensures seamless air-ground collaboration, apron collaboration, terminal collaboration, and traffic collaboration during real-time information sharing, on-site operations, and flight support, making the airport a new benchmark for smart airports.

In China, Huawei has helped 30 cities and city districts, including the cities of Changsha, Dongguan, and Wuhan, as well as Futian District in Shenzhen, win 34 prestigious smart city awards.

Finance

Building on its innovative technologies and expertise, Huawei jointly innovates and openly collaborates with financial institutions and partners. By the end of 2022, the company had served over 2,500 financial institutions from more than 60 countries and regions. Huawei also continued to promote and expand its Financial Partner Go Global Program (FPGGP), which aims to help the global finance industry go digital.

Through collaborative innovation in storage, computing, network, and cloud technologies, we help financial institutions build digital infrastructure that offers high performance, availability, security, O&M efficiency, and sustainability. In 2022, the *Asian Banker* presented a leading bank and Huawei with the Best Bank Infrastructure Technology Implementation in China award in the category of Financial Technology Awards.

We have delved deep into banks' transition to distributed systems and data intelligence upgrade. Our Cloud Native Banking Solution helped a leading bank modernize its core transaction system into a distributed system, which now serves 650 million users.

Our Financial Data Intelligence Solution helped a major bank upgrade its real-time marketing decision-making platform. This solution also helped commercial banks build a data mid-end, enabling their unified marketing, risk control, and operations, thus supercharging the digital transformation of regional banks.

Using AI decision making powered by device-edge-cloud synergy, the financial warehouse solution for inventory financing enables industry-finance innovation and boosts the real economy.

In the securities and insurance domains, we serve more than 10 stock exchanges and 100 securities traders and work with partners to build digital foundations.

Transportation

Aviation and rail: Huawei has established the Aviation & Rail BU that constantly explores industry digitalization and technological innovation by focusing on industry scenarios. We currently serve over 130 airports and airlines worldwide, more than 300 urban rail lines across over 70 cities, and more than 150,000 km of railways.

In the aviation domain, we worked with a partner to launch the Perimeter Security with Fiber Sensing Solution for smart airports. This solution covers long distances and guarantees full coverage, preventing missed alarms, minimizing false alarms, and ensuring the operational safety of airports 24/7. We have successfully combined innovative ICT technologies with a number of industry scenarios to build a solid digital foundation, and helped many airports advance their digitalization and build smart airports.

In the urban rail domain, Huawei's Urban Rail Cloud Solution has maintained its leadership position in the industry, and helped customers build smart urban rail showcases. We have also continued to innovate in the areas of urban rail big data, smart stations, and smart hubs, become deeply involved in the development of related industry standards, and worked with customers and partners to drive the industry ecosystem forward.

In the railway domain, 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, while also meeting the digitalization requirements of railways. The Trouble of Moving Freight Car Detection System (TFDS) solution

Huawei jointly innovates with a customer in the urban rail domain on building 5G-powered smart urban rail to explore 5GtoB showcases.

for smart railways, jointly developed by Huawei and a partner, has passed the acceptance test by a railway customer, marking the first time this solution has passed any acceptance in the industry. The solution can significantly improve TFDS efficiency and accelerate the intelligent development of railways.

Roads, waterways, and ports: Huawei currently serves over 200,000 km of roads and more than 50 waterway and port customers across over 30 countries and regions. We adhere to a "Platform + Ecosystem" strategy, always strive to find the right technology for the right scenario, and facilitate smooth mobility and logistics. Specifically, our work covers the following:

In the highway domain, we worked with a customer to build an all-round dynamic sensing system for a smart tunnel and its major junctions. We also worked with a customer to build a joint innovation center on smart highways and explore best practices in smart tunnel construction. Furthermore, we helped another major group customer continue to consolidate its big data center digitalization platform.

In the urban transportation domain, we worked with a customer to develop a new transportation management and service model that integrates sensing, regulation, and service. This model can serve as a benchmark for comprehensive, safe, and convenient urban transportation.

In the waterway domain, we teamed up with 20 partners to establish the Smart Port Global Innovation Lab. We also helped a port customer roll out 5G-powered L4 autonomous driving as it transformed into a safe and efficient smart port.

In the land port domain, we have worked with a port customer to develop a smart land port solution that supports the display of all operation status on a single

Smart container terminal of a port customer supported by Huawei's smart port solution

Huawei's digital converter station solution helps UHV converter stations pursue digital transformation in the areas of production, operations, management, and collaboration, offering a showcase for the digitalization of power grids worldwide.

screen, integrates smart inspections and customs clearance, and enables remote command. The solution has created a new smart port model that helps ports become more open, simplify management processes, and facilitate faster customs clearance to increase trade.

Energy

Electric power: Huawei has combined ICT technologies with industry best practices and digital platforms for electric power, to build end-to-end electric power solutions based on our Spark architecture that help power companies move towards secure, efficient, and green operations. We also published the *Electric Power Digitalization 2030* white paper, which draws a digital twin blueprint of the future electric power system featuring deep integration between digital and electric power technologies. To date, Huawei has established extensive partnerships with more than 190 power companies worldwide.

The power communication network we built for a power company meets both optical service unit (OSU) and automatically switched optical network (ASON) standards, creating a solid communications foundation upon which the company can build a new electric power system. For power grids, our digital converter station solution has helped ultra-high voltage (UHV) converter stations constantly improve operating efficiency. The solution has also been essential to the creation of a thriving application system. In addition, we have worked with partners to develop an intelligent substation inspection solution, which has been successfully deployed in the Middle East. A power grid company partnered with Huawei to innovate and pilot cloud orchestration on software in order to support the display of the entire power distribution network on a single screen (including the status of equipment and services), and overcome challenges encountered during the last mile of power supply services.

In the service domain, we have continued to work extensively with customers to explore new methods of electric power bandwidth operations and maximize the value of power assets. Huawei's intelligent net-zero carbon campus solution won the Champion Award (E-Environment Category) at the World Summit on the Information Society Forum 2022.

Oil and gas: Huawei currently serves more than 20 world-leading oil and gas companies.

Regarding oil and gas production, Huawei has launched the Intelligent Oil & Gas Fields Solution, which covers intelligent wellsites, intelligent stations, and an integrated oil and gas field network. We have worked alongside oilfield customers to innovate and develop leading digital and intelligent technologies. The goal is to build an intelligent, industry-leading oil and gas field by enabling full network coverage during on-site oil and gas production of the oil and gas field, collection of all relevant data, and comprehensive on-site sensing.

For oil and gas storage and transportation, we have worked alongside a number of customers to explore how to achieve visualization, manageability, and controllability of the operation process based on Huawei's security operations management platform, intelligent pipeline monitoring and warning solution, and other solutions. Together, we have also examined how to build intrinsic safety into on-site operations. Ultimately, these efforts aim to monitor pipeline security and provide alarms around the clock, and guarantee the security of energy transmission.

Huawei partnered with a gas customer to build smart natural gas stations, apply digital and intelligent technologies to traditional business scenarios at gas stations, and build intrinsic safety into pipelines and facilities.

Regarding refined oil sales, we launched the Smart Gas Station Solution, which creates a converged platform based on edge intelligence and aggregates necessary ecosystem capabilities. In this way, the solution helps oil retailers realize precise marketing, agile services, simplified operations, and smart decision making.

Mining: Our Mine BU has teamed up with both partners and mining companies to accelerate the implementation of our intelligent mining solutions that adopt the industrial Internet architecture. We provide digital services for many Chinese mining companies, including major coal groups and metal and non-metal mining groups:

- Our MineHarmony smart mining OS has been successfully operating on more than 3,300 sets of equipment for over a year.
- Our AI mining model was commercially deployed by a mining company for the first time, and is set to facilitate the future large-scale adoption of AI during mining.
- We helped mining customers make their entire coal mines intelligent and deploy a digital twin that covers every aspect of a coal mine to enable the manageability and visualization of personnel, mechanical, and environmental data. As a result, the number of workers who need to work underground has been reduced and the productivity of each shift has significantly increased.

Our innovative solutions, such as intrinsically safe IP and F5G products and remotely controlled coal mining based on video splicing and 5G, have received high industry acclaim. These solutions have helped mining companies usher in a new intelligent era.

Huawei partners with mining customers worldwide to make mines smarter, safer, and more efficient through the application of 5G, AI, and Industrial Internet technologies.

Manufacturing

As a manufacturing company itself, Huawei leverages its own digitalization experience and ICT products and technologies, and works with industry partners, to support the digitalization of other manufacturing companies and help the industry shift towards intelligent manufacturing.

In the R&D domain, we provide solutions like the engineering simulation platform and high-performance desktop cloud to help automakers, electronics companies, pharmaceutical companies, and many others improve their operating efficiency and accelerate product innovation.

In the production domain, we have helped manufacturing companies build fully-connected factories powered by Wi-Fi 6 and F5G, thus connecting more production line equipment to the network and making scheduling more flexible. We help manufacturing companies optimize their production technologies and processes and improve quality through the acquisition and analysis of key production data.

In the infrastructure domain, we helped many manufacturing companies build all-flash data centers. Our active-active solution ensured zero data loss and supported the reliable operations of customers' core R&D systems.

Education

Huawei applies connectivity, cloud, and other ICT technologies to education to help universities and vocational schools cultivate innovative talent, accelerate innovation related to teaching and scientific research, and bridge the digital divide. We also actively work to drive equity in basic education. To date, we have served more than 2,800 education ministries, universities, and research institutes in over 120 countries and regions.

In **higher education**, more than 30 of the QS World University Rankings' top 100 universities have chosen Huawei as their partner for digital transformation.

In **basic education**, Huawei's Smart Education Solution developed based on cloud, network, and device capabilities features one screen, one network, one platform, one cloud, and one portal. China's Ministry of Education has decided to pilot a project on the digital transformation of education in Shanghai. In support of this project, we have provided cloud, big data, and other key technologies to accelerate the digitalization of education in Shanghai.

Healthcare

Huawei's ICT solutions currently serve more than 2,800 medical institutions in over 90 countries and regions.

In China, we support the development of smart hospitals to help ensure safe and more efficient hospital operations and increase the quality of hospital services. We have helped multiple grade A tertiary hospitals go digital and currently serve more than 1,800 tertiary hospitals. Huawei has served 97 of the top 100 hospitals on the *2021 China Hospital Rankings* list released by the Hospital Management Institute of Fudan University.

In Europe, Huawei's all-flash storage system supports the efficient and stable operations of core service systems in hospitals and protects medical data throughout its lifecycle. A provider of senior care services used Huawei's converged campus network solution to provide green, sustainable, stable, and high-quality network services for its clients.

Internet Services

Huawei has provided connectivity, data center infrastructure, and public cloud solutions to more than 2,600 Internet service providers (ISPs) across the globe, while working with partners to accelerate the Internet service industry's shift to an all-optical, intelligent, and service-based industry.

Regarding **Internet access and enterprise connectivity**, we provide a full portfolio of products and solutions that cover access networks, metropolitan area networks, and backbone networks to help ISPs build ultra-broadband networks capable of supporting intelligent operations and delivering superior service experiences.

In **Internet data center services**, our green, low-carbon data center solutions can be employed to build efficient, green, and secure data centers. We also help managed service providers provide cloud-based network services and storage hosting services.

For **Internet content services**, we develop innovative Internet data center infrastructure and Internet public clouds that can work together to help customers across various industries, such as e-commerce, audio and video, and gaming, make the most of their resources and achieve service agility. In China, we currently serve 90% of the top 50 e-commerce companies, 85% of the top 50 gaming service providers, and 75% of the top 50 culture and entertainment companies.

SMEs

As the digital economy gains traction, an increasing number of SMEs find themselves in urgent need of digital technologies so that they can boost their operating efficiency and revenue. For the global commercial and distribution market, Huawei has established business teams that work alongside partners to help SMEs go digital faster.

Based on the business processes of our customers and integrators, we focus on five areas (i.e., R&D, marketing, sales, supply, and services) as we look to develop more marketable products and solutions and optimize our business processes, organizational structure, and IT systems. This is intended to offer our partners comprehensive support when they sell and deliver Huawei products and solutions and serve customers.

For partners, we have developed a one-stop digital operations platform through which more than 500 marketable products and 70 scenario-based solutions for the commercial market have been launched. Covering over 10 industries, these products and solutions help partners improve their efficiency in marketing, customer expansion, sales order distribution, order management, and service support.

To better serve SMEs, Huawei has launched the transformation of its distribution business, which entails the systematic optimization of the business. We have established six distribution product R&D teams and invested dedicated R&D resources into these teams in a bid to develop competitive, marketable products with a focus on distributors and engineering contractors. Our comprehensive channel system, healthy market, practical marketing, and efficient digital operations platform for the distribution business come together to boost transaction efficiency, help distribution partners develop engineering contractors and installation service providers, and effectively support the SME market.

Intelligent Campuses

Huawei's portfolio solutions for intelligent campuses pre-integrate ICT technologies, targeting high-value scenarios, and constantly build competitiveness in multi-product convergence to support industry digitalization. Together with our partners, we have used these solutions to serve more than 850 customers across various sectors, including government, education, healthcare, manufacturing, and port, helping them create intelligent campuses that are efficient, green, and convenient. Two examples are as follows:

- In China, we worked with partners to help a customer build a demonstration system for integrated security and fire safety in warehouses. We also helped the customer explore the best models for building standardized and integrated campus IoT platforms and campus management business platforms that could enable the process-based and digital management of people, equipment, and incidents. Our solutions now cover 23 warehouses and 1 office building of the customer, connecting over 10,000 sets of security and fire safety equipment.

- In Asia Pacific, we worked with partners to build a global flagship intelligent campus that covers office, hotel, residential building, and commercial scenarios. The unified business management platforms and ICT infrastructure we built for this campus support smooth evolution and echo the customer's vision for sustainable development.

Data Centers

Huawei fully leverages its strong business portfolios to drive the development of new data centers that are intelligent, intensive, and green. We have launched 14 portfolio solutions that make it easier for customers and partners to design and select products. These solutions accelerate the launch of services through pre-integration and pre-verification, and have already been adopted by more than 160 customers in numerous sectors like finance and government. For example:

- In the finance sector, we launched the industry's first unified disaster recovery portfolio solution based on Storage & Optical Connection Coordination (SOCC) to help customers build highly stable and reliable active-active data centers.

- In the government sector, our multi-level DC solution enables data center consolidation and upgrade, ensures efficient business collaboration between head offices and branches, and reduces O&M costs.

- The *Research Report on the Green and High-Quality Development of Data Centers* we published in 2022 provides reference standards for the development of data centers in China, particularly regarding the implementation of the "Eastern Data, Western Computing" project.

WANs

Industry digitalization is accelerating service migration to the cloud. WANs, which serve as the foundation for extensively connecting campuses, sites, data centers, and other types of production sites, are undergoing a transformation from connecting support systems to connecting production systems. Industries continue to ramp up investment in WANs.

Building upon Huawei's strengths in IP and optical technologies, we have developed six portfolio solutions that target business scenarios such as production, office automation (OA), and public services. These solutions have been adopted by customers across a range of sectors including government, energy, transportation, finance, and ISPs, helping all of them build intelligent WANs with committed SLAs and optimal service experience, unleash the potential of data, and accelerate digital transformation.

WANs are shifting from siloed network construction towards intensive network construction and then onto service-oriented unified operations. Huawei is pioneering the development of service-oriented WANs and has proposed the innovative Network Smart-cockpit Solution, which facilitates the service-oriented operations of government extranets.

Digital Sites

Huawei has launched a series of portfolio solutions for digital sites by focusing on the digitalization of outfield infrastructure in three key areas: digital pole sites, digital pipelines, and digital stations. We employ the latest ICT technologies, such as those related to sensing, connectivity, and computing, to outfields, and work closely with customers and partners to deploy open and intelligent sensing networks, enable industry digitalization, and drive society forward.

- Our Radar- and Video-based Management Pole Site Portfolio Solution enables "intelligent highways" that support accurate, long-distance sensing and are easy to build, operate, and maintain. This fulfills customer requirements for rapid deployment, accurate sensing, and refined management and control.
- Our Perimeter Protection Site Portfolio Solution applies digital technology to perimeter protection, significantly reducing the manpower required for inspections and simplifying equipment O&M.
- Our Integrated Digital Station Portfolio Solution streamlines systems within a station, centrally manages equipment, and slashes or even eliminates the manpower required for operations, significantly improving overall operating efficiency.

A Thriving Enterprise Ecosystem and Global Service Capabilities

Huawei is constantly teaming up with more and more partners, and continues to invest in and optimize the talent ecosystem. We will continue working with our partners to provide consistent, high-quality services to customers.

Partner Strategy

In the enterprise market, Huawei is absolutely committed to its Being Integrated strategy in the long term. We consistently implement fair, just, transparent, and simple partner policies, and openly collaborate and share value with our partners. Our goal is to build a robust, win-win partner system that is interest-bonded, integrity-centric, and rule-based.

By the end of 2022, we had over 35,000 partners worldwide, including more than 25,000 sales partners, 8,000 solution development and service partners, and 2,400 talent alliance partners.

Moving forward, we will continue helping partners increase profits, simplifying our partner policies, improving partners' capabilities, developing digital toolkits, and building healthy ecosystems. Throughout this process, we will also increase our investment in partners, further our efforts regarding partner development and engagement, and build the cornerstone for our long-term survival and rapid development.

Talent Ecosystem

Huawei works to build talent ecosystems for teachers and students, lifelong learners, and industry practitioners by establishing talent alliances, contributing to talent standards, improving talent capabilities, and communicating the value of talent in order to improve digital skills throughout society.

The Huawei ICT Academy program is a partnership between Huawei and universities that aims to share Huawei's cutting-edge ICT technologies with universities worldwide and cultivate new ICT talent. By the end of 2022, we had established Huawei ICT Academies with more than 2,200 universities across the globe. Through this program, we train an average of more than 200,000 students each year. Furthermore, the Huawei ICT Competition provides an international platform through which university students from around the world can compete and share ideas with each other. The sixth Huawei ICT Competition, held in 2022, attracted 150,000 university students from 85 countries and regions.

Huawei continuously optimizes its certification system, which covers both career certifications and specialist certifications. By the end of 2022, we had presented over 750,000 certifications worldwide, including more than 21,000 Huawei Certified ICT Expert (HCIE) certifications. Engineers who hold our certifications are valuable resources for industry digitalization worldwide.

Enterprise Services

Huawei always remains customer-centric when providing services to enterprise customers, and constantly works to improve their service experience. We collaborate with over 6,000 service and operation partners to provide consistent, high-quality services to more than 56,000 customers worldwide. In 2022, we supported the secure and stable operations of more than 120,000 customer networks, and customer satisfaction with our services constantly improved. Huawei was positioned by IDC MarketScape as a Major Player of enterprise services, showing that our service capabilities have received wide acclaim.

We have continuously increased our investment into industry digitalization services, and developed a series of service and delivery tools to enhance service automation and intelligence, providing industry customers with services at every stage of the solution lifecycle, from consulting, design, and implementation to O&M support. Our training and certification programs serve as a major source of high-quality talent for industry digitalization.

Connectivity

As we stride towards an intelligent world, unprecedented new requirements for connectivity will be raised by individual users, homes, and industries. Individual users will need ubiquitous 10 Gbit/s connections for extended reality (XR), new calling, and other emerging services. Homes will need 10 Gbit/s experience for a range of smart services backed by all-optical networks. As industries go digital, they will develop diverse requirements for both the quantity and quality of connections and sensing capabilities, as well as new requirements for the intelligent scheduling of computing power. To address these needs, Huawei has worked with industry partners to define 5.5G and drive the connectivity industry forward.

Wireless Network

- **Robust and coordinated development across the wireless industry**
  - 5G has progressed by leaps and bounds, thanks to the concerted efforts of the entire industry. At present, more than three million 5G sites are in operation, serving over one billion 5G users globally, an increase of over 100% YoY.
  - 5G plays a vital role in the digital transformation of industries. Huawei has developed insights into the needs of vertical industry users, and collaborated with carriers and industry partners to accelerate 5G adoption in verticals. So far, more than 20,000 5G industry applications have been launched.
  - 5G-Advanced has been defined as the next evolution of 5G, and Huawei and its partners are working to drive the 5G-Advanced industry forward. Together, we will press ahead with the work of Releases 18, 19, and 20 in an orderly manner, defining technical specifications and enriching the connotations of the technology. Our efforts will further boost 5G network performance, enrich 5G system capabilities, and drive wider adoption of 5G applications.

- **Continuously improving solutions for all scenarios to help carriers build green 5G networks with superior experience**
  - 5G is already in large-scale commercial use across the globe. Thanks to its ability to support Massive MIMO and large bandwidths, 5G has delivered a 10-fold improvement in user-experienced rates, enabling a gigabit experience everywhere. Based on its ongoing innovation in software and hardware, Huawei has launched a full series of MetaAAU products for all scenarios, in order to increase uplink and downlink coverage, optimize user experience, and slash energy consumption. As part of our goal to drive all bands to 5G, we have leveraged ultra-wideband and multi-antenna technologies to efficiently integrate discrete spectrums. By doing this, we help carriers simplify multi-band deployment, improve spectral efficiency, and ensure the experience of both 5G and 4G networks.
  - In indoor scenarios that require large network capacity (e.g., shopping malls, airports, and stadiums), Huawei's LampSite series solutions – supported by distributed Massive MIMO – provide users with a ubiquitous gigabit experience comparable to what's available in outdoor settings. Our solutions are building momentum for indoor digitalization with 5G.
  - In remote rural areas, Huawei's RuralLink solution simplifies network deployment by eliminating the need for equipment rooms, fiber cables, and mains power. Huawei is committed to collaborating with carriers and industry partners to connect the unconnected and bring the benefits of mobile broadband to everyone.
  - In addition, Huawei brings intelligence to wireless networks and enables in-depth collaboration between all bands and all scenarios. Our intelligent solutions help carriers meet a diverse range of service requirements while boosting O&M efficiency and user experience and reducing energy consumption.
- **Driving industry evolution towards 5.5G to embrace an intelligent world**
  - An intelligent world is fast approaching. During digital transformation, industries face a growing array of new requirements, which in turn raises the bar for their wireless networks. Huawei and its industry partners have jointly defined the 5.5G industry vision and reached a consensus on the characteristics of 5.5G networks. We believe that 5.5G will provide a 10-fold improvement in network capabilities, offering 10 Gbit/s experience, 100 billion connections, and native intelligence. 5.5G will be a key milestone on the path to the intelligent world.
  - The wireless industry is making meaningful efforts in 5.5G technological research and standardization. The verification of key 5.5G technologies, including flexible spectrum access, ultra-large uplink, and low-power high-accuracy positioning, has been completed. These technologies have gained enormous recognition within 3GPP.
  - Advances in standardization, spectrum, industry chain, and ecosystem development will turn 5.5G from an agreed idea into a true reality. Together with its industry partners, Huawei aims to contribute to a mature 5.5G industry and lay the groundwork for 5.5G commercialization, thus paving the way for the intelligent world.

Cloud Core Network

5G is now in the fast lane. New services and scenarios targeting individuals, homes, and businesses are continuing to emerge, and demand for video and interactive calling is soaring. Immersive video technology is reaching maturity. As industries go digital, their networks will face a growing array of new requirements in different scenarios. All of these developments raise the bar for networks. The industry has reached a consensus on the evolution direction of 5.5G Core and relevant key technologies. Comprehensively enhancing connectivity and achieving full-service enablement will be key to unleashing the potential of networks and creating value across the industry.

Huawei's Single Packet Core (SPC) and Single Voice Core (SVC) solutions are built on a dual-engine Telco Converged Cloud to support 2G, 3G, 4G, NSA 5G, and SA 5G, helping carriers rapidly launch 5G services and deliver differentiated experiences. Huawei's autonomous driving network (ADN) solution props up core networks with agile delivery, high reliability, and optimized experience, enabling automated delivery and proactive fault prevention. Huawei has been recognized by consulting company GlobalData as the sole leader in both 5G Core and IP Multimedia Subsystem (IMS).

In the voice domain, voice and video calling will transform into intelligent and interactive calling. Huawei's New Calling solution is based on a "1 + 3 + N" architecture. Specifically, this solution leverages a New Calling Service Enabling Platform ("1") to create UHD, intelligent, and interactive calling capabilities ("3"), which carriers can use to develop a great variety of innovative services ("N") such as visualized voice calling, real-time translation, and fun calling. Our solution will contribute to a new future of calling.

In the video domain, multi-screen interaction and social video are gaining traction. The Huawei Envision Video solution supports the hybrid deployment of both IPTV and OTT. The Huawei Vivision solution automatically converts video content, both on-demand video and live streams, into 3D video streams. These solutions put carriers in a better position to turn video into their new source of growth.

5G industry private networks based on multi-access edge computing (MEC) have become essential ICT infrastructure of enterprises. Through MEC to X, Huawei provides scenario-based solutions for manufacturing, mining, power grids, and other industries, accelerating their digital transformation. At the 2022 5G World Summit, Huawei was presented with the Enterprise 5G Leadership Award.

Optical

Huawei continuously innovates in optical transmission, optical access, and optical applications. Through cooperation with our customers, partners, and industry organizations, we are supporting the sustainable development of a green all-optical industry and turbocharging digital transformation.

Collaborating with industry partners to support the sustainable development of a green all-optical industry

The European Telecommunications Standards Institute (ETSI) has developed the definition for the fifth-generation fixed network (F5G), and, in September 2022, released the *F5G Advanced and Beyond* white paper. The industry has reached a preliminary consensus on F5G's enhanced capabilities and the three new directions of F5G Advanced (F5.5G). Huawei will keep innovating on F5.5G and developing more application scenarios alongside carrier, enterprise, and government customers, as well as industry partners to build a flourishing ecosystem.

Innovating nonstop to stride towards the intelligent world

- **Optical transmission**

  Large bandwidth, low latency, and high reliability are basic carrier requirements for both 5G and F5G gigabit optical networks. Huawei has released a full range of 400G solutions that carriers can use to build gigabit networks for all of their services and scenarios. By the end of 2022, our 400G solutions had served more than 60 carriers worldwide. Our OptiX Alps-WDM solution brings optical switching into aggregation and access network sites, and creates a dynamic bandwidth resource pool to provide 100G access to every site, offering an optimal experience and enabling carriers to achieve the high-quality development of all their services.

  GlobalData 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. GlobalData also named our OptiX OSN 1800 as the leader in its *Packet-Optical Access: Competitive Landscape Assessment* report.

- **Optical access**

  Home broadband networks will evolve into F5G gigabit networks that provide 10 times larger bandwidth, 100 times more connections, a millisecond-level latency, and seamless Wi-Fi roaming. To support this evolution, Huawei has launched FTTR OptiXstar F30, an all-optical FTTR networking product that offers 2 Gbit/s bandwidth, in order to bring digital lifestyles to the next level. Huawei has also worked with over 20 leading carriers on next-generation PON innovation. Through these efforts, we aim to help carriers navigate their evolution to F5.5G 10 Gbit/s networks.

  At the 2022 Broadband World Forum, Huawei received the Outstanding FTTH Solution Award for its SingleFAN Pro solution, which leads the way in next-generation optical access evolution.

- **Enterprise optical network**

  Huawei's FTTO solution has helped more than 6,000 industry customers from over 50 countries efficiently build green, simplified smart campus networks. In addition, we have launched the MiniFTTO solution for micro and small campuses,

helping small and micro businesses go digital faster. We have also released the industry's first Storage-Optical Connection Coordination (SOCC) solution for the finance sector to support stable and reliable financial transactions; and perimeter detection solutions that leverage optical-visual linkage to realize high-precision, all-weather, and full-coverage protection and detection for airports, railways, and other sectors.

- **Optical applications**

  Huawei is bringing its innovations in optical communications to power optical applications to create tangible value for a growing number of industries.

Data Communications

As digital transformation continues to advance and commercial intelligent applications become more commonplace, the data communications industry is moving faster towards Net5.5G. Huawei Datacom is committed to making IP on Everything a reality. With this in mind, we have continuously upgraded our Intelligent Cloud-Network Solution, which is powered by our AirEngine, CloudEngine, NetEngine, and HiSecEngine data communications products. Huawei was named a Leader in the 2022 Gartner® Magic Quadrant™ for Enterprise Wired and Wireless LAN Infrastructure. Going forward, Huawei will continue to work with its customers, partners, and industry organizations to drive an industry consensus on Net5.5G and accelerate innovation in related business scenarios.

- **Campus network**

  Campus networks are evolving and merging with office and production environments. Huawei's CloudCampus 3.0 solution enables businesses to build simplified networks that can serve as innovative infrastructure for premium user experience. Specifically, in office scenarios, our "200 Mbps @ Anywhere" solution, which is built upon Huawei's CloudEngine S8700 and AirEngine AP, supports audio and video conferencing, along with other novel services. In production scenarios, our high-performance core switch CloudEngine S16700 and intrinsically safe APs bolster wireless industrial networks to make them superfast, stable, and reliable. In multi-branch interconnection scenarios, our SD-WAN solution integrates security, switching, and routing functions to enable on-demand connections across branches and clouds, making cloud migration more efficient.

- **Data center network**

  Increasing adoption of multi-cloud architectures and requirements for diversified computing power are driving data center networks to embrace hyper-converged Ethernet. Huawei's CloudFabric 3.0 solution leads the industry with its L3.5 ADN capabilities, making it possible for businesses to roll out multi-cloud heterogeneous networks within minutes and achieve integrated O&M for both applications and networks. The hyper-converged lossless Ethernet of CloudFabric 3.0 helps boost computing efficiency and reduce energy consumption per unit of computing power. Our CloudEngine data center switches stand out thanks to their ultra-large capacity, reliability, intelligent functions, and green features. These switches are essential for businesses hoping to build a trusted and reliable data center network with an advanced architecture and full set of functions.

- **WAN**

  Carriers need to build converged transport networks in order to achieve growth in the mobile, home broadband, and B2B markets. That's where Huawei can help. Our universal-service routers utilize 400GE and 800GE metro and backbone ultra-broadband technologies, and provide digital maps, SRv6, and slicing capabilities that carriers can use to build premium private lines and create connections within minutes to address enterprise customers' demand for multi-cloud connection. Enterprise WANs are evolving to deliver multi-service transport and leverage IP technology for production services. Huawei's CloudWAN 3.0 helps create megabit-level network slices to effectively support mission-critical services. Featuring innovative technologies such as 400GE, 800GE, and IPv6 Enhanced, our NetEngine routers are essential for full-service convergence, differentiated assurance, and intelligent O&M for WANs.

- **Cyber security**

  As digital transformation ramps up, and connections and applications continue to multiply, the boundaries of cyber security continue to expand. In response to this growing challenge, Huawei has launched the HiSec 3.0 solution, which uses a three-layer architecture (cloud, local, and edge) and enables integrated defense through the synergy of the cloud, network, and security devices. Huawei's HiSecEngine series, all-in-one intelligent security gateways, are a great fit for businesses seeking to build resilient and secure networks.

Computing

With the intelligent world fast approaching, data has become the new primary factor of production and computing power the new productivity. In the intelligent era, we will see a massive explosion in data, ubiquitous computing, and a proliferation of intelligent applications aimed at different scenarios. As these scenarios and data types will come in a greater variety, diversified computing is the way forward. At Huawei, we are committed to open collaboration for shared success. Together with our partners around the world, we are providing diversified computing, ushering in a new era of computing that benefits everyone.

Co-creating the Foundations for a Vibrant Digital and Intelligent Industry Ecosystem

Huawei is committed to accelerating the digital and intelligent transformation of industries by developing the computing industry around Kunpeng and Ascend. Kunpeng features general-purpose computing capabilities while Ascend targets AI computing capabilities. Sticking to our strategy of "open hardware, open source software, partner enablement, and talent cultivation", we work with our partners to drive the computing industry forward and foster a vibrant ecosystem.

So far, more than 5,200 partners and 3.1 million developers have joined the Kunpeng and Ascend ecosystems, and more than 14,000 solutions have been certified. Together, we have trained over 5,000 instructors and 500,000 students to provide the talent the industry will need to thrive.

Kunpeng: A digital foundation to dive deep into industrial digital transformation

In 2022, we went beyond application porting to supporting Kunpeng-native development, making Kunpeng not just usable, but useful. We are now working with more than 4,200 partners and 1.9 million developers on Kunpeng, and together we have made more than 12,000 Kunpeng-compatible solutions available.

Huawei has upgraded the Kunpeng DevKit and the Kunpeng BoostKit to make development more efficient for developers and improve application performance.

The past year also saw creative and dynamic development in the two open source communities – openEuler and openGauss – as more and more developers, enterprises, and institutions joined. Nine major operating system (OS) partners have released commercial distributions based on openEuler 22.03 long term support (LTS). Multiple openEuler Ecosystem Innovation Centers have been established to support the development of local foundational software ecosystems. openGauss has been adapted to more than 500 solutions across different sectors, including government, finance, and telecommunications.

Ascend: An intelligent foundation to accelerate industrial intelligent transformation

The past year has seen rapid development of Ascend AI which continues to grow in its role as an intelligent foundation for industries. Huawei is now working with more than 1.2 million developers on Ascend, and our more than 1,000 independent software vendors (ISVs) have launched over 2,000 industry-specific AI solutions.

Our heterogeneous compute architecture CANN already supports multiple mainstream AI frameworks. The new version released in 2022 also supports native C/C++ operator development, lowering the threshold for operator development and making development more efficient. The MindSpore open source community continues to grow and pool the wisdom of more developers. It has already received contributions from 8,700 developers and collaborated with more than 200 universities and research institutes on innovation, with more than 800 enterprises receiving MindSpore technical certification.

Ascend is also facilitating deep dives into AI for a wide range of sectors, including smart city, manufacturing, finance, telecommunications, healthcare, and education. In the coal mining industry, Ascend AI is being used to improve productivity, safety, and reliability. In steelmaking, Ascend AI is being used to automate the entire rough rolling process through intelligent angle identification and automatic angle adjustment, freeing human operators from this labor-intensive work in extremely hot, raucous environments. In addition, an all-in-one sign language teaching device powered by Ascend AI has been developed to eliminate learning barriers for the hearing impaired by using multi-modal interaction features. It can automatically generate images and videos from text, interpret sign language, recognize facial expressions, and read lips in real time to make learning more interactive for the hearing impaired.

Nonstop Innovation for a High-performance, Reliable, and Green Storage Foundation

Huawei continues to innovate in data storage and 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.

In terms of critical enterprise applications, Huawei offers storage solutions that cover the entire lifecycle, from data production to data backup and archiving. Our latest OceanStor Dorado All-Flash Storage supports the Geo-Redundant 4-Data-Center Disaster Recovery Solution, while also featuring active-active capabilities for enterprise network-attached storage (NAS). Every year since 2016, Huawei has been named a Leader in Gartner® Magic Quadrant™ for Primary Storage. In addition, Huawei launched a four-layer ransomware protection solution which detects ransomware with 99.9% accuracy, providing enterprises with a last line of defense.

Furthermore, Huawei's OceanStor Pacific Scale-Out Storage solution was launched to support the value extraction, decision-making analysis, and long-term archiving of mass, exabyte-level unstructured data. The solution uses a groundbreaking multi-DC, multi-active data recovery (DR) architecture, features cross-domain high-ratio erasure code (EC), and doubles the overall utilization rate. The solution can effectively support various service types, such as high-performance computing, big data analytics, and mass data backup and archiving. The OceanStor Pacific Series has been recognized with a Gartner® Peer Insights Customers' Choice distinction.

Regarding cloud and Internet data centers, Huawei advocates an innovative diskless architecture for servers. Huawei has also launched OceanDisk products to leverage the advantages of storage and computing separation, based on diskless servers, slashing both data center footprint and power consumption by 40%.

To support data storage in branch and edge scenarios and small- and medium-sized data centers, Huawei has launched a number of products and services, including the hyper-converged software and tool suite FusionCube, the DME IQ Intelligent Cloud O&M Platform, the HUAWEI Blue Whale Marketplace, and hyper-converged computational storage hardware. These products and services have helped us realize a leap in development from device convergence to application convergence, from center to edge, from single computing architecture to diversified computing power, and from single-vendor full-stack integration to software and hardware ecosystem collaboration. We want to enable all our partners to more easily develop and use hyper-converged products, and help enterprise customers further simplify their IT infrastructure.

Moreover, Huawei launched the Datacenter Virtualization Solution (DCS), which leverages Huawei's capabilities in ICT software and hardware collaboration and supports ecosystem-wide open collaboration. Through these efforts, we hope to help industry customers build lightweight IT infrastructure.

Finally, Huawei helps customers build the most suitable data infrastructure by offering a range of storage solutions that support intelligent data tiering, data sharing, cross-cloud data flow, and containerized storage.

Bringing Digital to Every Workspace to Provide Smart Office for All

Through ongoing innovation in intelligent collaboration, Huawei is committed to helping enterprises create digital workspaces and smart offices, allowing everyone to enjoy smart office experiences.

In scenarios like administrative video conferencing, visualized command, and telemedicine, the Huawei CloudLink video conferencing series provides users with reliable solutions and brings 4K and AI experiences to more people than ever before. This industry-leading series is already being used by customers across the globe.

Regarding smart office and smart education scenarios, the latest HUAWEI IdeaHub series offers various cutting-edge functions such as 4K professional-level video conferencing, Multi-Window, and App Multiplier. So far, we have opened up six types of software development kits (SDKs) as part of our commitment to work with partners to develop the industry ecosystem and make digital offices and digital production a reality across industries.

ICT Services and Software

Huawei has engaged in ongoing joint innovation with its customers to offer the ICT Digital Intelligence Services and Software Solution which covers the entire lifecycle of a network, including network planning, construction, operations and maintenance (O&M), optimization, and service operations. More specifically, the solution covers six core aspects: green and efficient integration, robust networks, intelligent O&M, ultimate experience, new digital services, and digital talent cultivation. It is designed to facilitate digital and intelligent transformation across industries by helping carriers build green, efficient, and robust infrastructure that provides the ultimate experience.

Building Target Networks with Green and Efficient Integration Solutions

In 2022, Huawei continued helping customers construct sites, networks, and data centers to build green target networks that feature smooth evolution. Our work has helped save around 400 million kWh of electricity and reduce carbon emissions by about 140,000 tons.

- Network integration: Through measures like spectrum refarming and resource optimization, we have improved asset utilization and reduced the energy consumption of mobile networks by more than 10%. By clearing and migrating invalid services and taking a number of other measures, we have reduced the energy consumption of optical network reconstruction by about 60%. Furthermore, by introducing intelligent cabinets, blade power, and backup PV systems to simplified sites, we have managed to reduce carbon emissions by over 35%.

- IT integration: We have introduced a full-stack liquid cooling architecture and a L1/L2 collaborative intelligent optimization feature for data centers, significantly improving the energy efficiency of data centers. Additionally, the use of prefabricated and assembled modules can cut the time taken for data center L1 construction by about 20%.

- Industry integration: Through data standardization and governance, Huawei has helped industries integrate various different data sources. In the port sector, our services enable customers to view real-time shipping data and generate reports 90% faster. In the road sector, we have helped customers share information across departments, and we have provided data support for over 20 applications including road wrecker and rescue services and intelligent operations centers.

Underpinning Intelligent Connectivity with Robust Networks

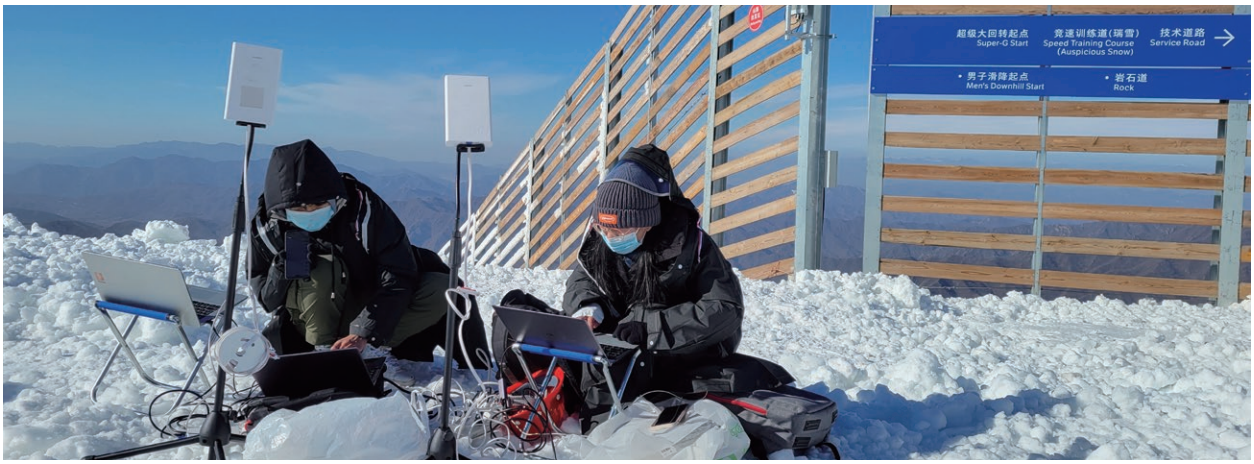
With three Global Technical Assistance Centers (GTACs), 10 Technical Assistance Centers (TACs), and more than 6,000 maintenance experts, Huawei provides 24/7 customer support services for networks in nine languages. We have supported more than 1,000 carrier and industry networks, and also provided network support for numerous industry customers and various major events around the world. We always go where 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. Built upon our ongoing investment in innovation, our solution delivers risk prediction and prevention capabilities, guarding against major network risks. We also run emergency response drills to ensure network resilience and stable operations.

Moving Towards Higher-level Autonomous Networks with Intelligent O&M

It has become an industry consensus to move towards L3/L4 autonomous networks (ANs) that feature human-machine collaboration. The TM Forum, alongside industry partners, has been driving standards development and architectural evolution for ANs and, ultimately, promoting the development and implementation of the Autonomous Operations Maturity Model (AOMM) and Value Operations Framework (VOF). Huawei's intelligent O&M solution, AUTIN™, has been designed to drive the transition towards intelligent O&M with zero service impact, zero interventions, and zero code development. In 2022, the TM Forum named the "Talent for Tomorrow" project, jointly initiated by Huawei and a carrier customer, "Best new Catalyst in show" for its contributions to digital talent upskilling.

Unlocking the Business Potential of Networks by Delivering the Ultimate Experience

Thanks to ongoing investment into network performance and service experience, Huawei has been able to help improve the user experiences of major over the top (OTT), high-definition voice, and ToB services by offering lower latency and higher throughput. In addition, with model fitting analysis of network performance, experience, and energy consumption, we help our customers deliver the best network performance and service experience with minimal energy consumption.



A Huawei team performs network maintenance and testing 2,000 meters above sea level on top of a mountain in Beijing, China to ensure the quality of high-definition live streaming.

Monetizing network performance and service experience has become a common requirement of carriers. Huawei's latest Smart Decision solution, as part of the broader SmartCare® solution, offers data-driven assisted marketing which, in turn, will increase 5G user penetration and average revenue per user (ARPU). In 2022, the "Leveraging AI/ML to drive CX business outcomes proactively" catalyst project, jointly initiated by Huawei and its carrier partners, won the "Catalyst industry contribution to TM Forum" award.

Enabling Operational Innovation and Business Growth through New Digital Services

Huawei is committed to innovation in digital platforms and services, in order to realize agile service processes and business growth. To date, our diverse digital services have served more than three billion users worldwide.

- Huawei's next-generation fully convergent billing solution (CBS) delivers convergent billing capabilities that support all radio access technologies (RATs) and both pre-paid and post-paid models. The solution also supports smooth evolution and capacity expansion, helping carriers further simplify their IT systems and improve operational efficiency.

- Huawei's Mobile Money solution enables carriers to provide innovative digital services like mobile wallet and mobile payment in emerging markets, providing more people with easy access to digital services and driving the prosperity of local digital economies.

- Our AI contact center (AICC) solution redefines call center service experiences and reduces cost per call with its all-scenario intelligence and omni-channel video capabilities. The solution has helped revamp call centers across a range of sectors, including communications, finance, and government.

Embracing the Intelligent World by Nurturing Digital Talent

Huawei leverages years of ICT technical expertise and management practices to provide training services to customers across industries, helping them improve managers' understanding of transformation and cultivate employees' digital skills. In 2022, we cultivated nearly 160,000 ICT professionals worldwide, with more than 100,000 participants receiving Huawei's ICT certification.

- Talent cultivation for carriers: We have worked with multiple carriers to provide workshops and enablement sessions regarding topics such as strategy and transformation. Through scenario-based hands-on practices and certification, Huawei has cultivated over 8,000 5GtoB professionals for carriers.

- Talent cultivation for industries: Huawei provides management, business, and technical training services for industries such as coal mining, port, electric power, manufacturing, and finance. By the end of 2022, we had completed more than 200 enterprise transformation enablement sessions and trained over 20,000 technical professionals.

- Talent cultivation at universities: Through the "Talent Practice Platform", Huawei provides online experiment simulation services across 22 ICT technical domains, serving 81 universities worldwide by the end of 2022.

Cloud Computing Business

Huawei Cloud's core strategy is to provide Everything as a Service, including Infrastructure as a Service, Technology as a Service, and Expertise as a Service. This strategy will help us enable our industry customers to unleash the power of digital in this era of rapid digital transformation. Huawei Cloud is committed to building the cloud foundation for an intelligent world with ubiquitous cloud and pervasive intelligence.

By the end of 2022, Huawei Cloud had launched more than 240 services. As our global market share grew rapidly, so did our cloud service capabilities. In October last year, Huawei Cloud was also recognized in Gartner's 2022 Magic Quadrant for Cloud Infrastructure & Platform Services (CIPS).

Everything as a Service: The Strategy that Delivered Rapid Growth in the Global Market

In China, Huawei Cloud has delivered more than 700 e-government clouds, helping more than 150 cities achieve their "One City, One Cloud" objectives. We currently serve China's six major state-owned banks, 12 joint-stock commercial banks, the top five insurance institutions, and seven of the top ten traditional securities firms. We also serve 90% of China's top 50 e-commerce companies, 90% of the top 30 car manufacturers, and 80% of enterprises in China's autonomous driving industry.

In Asia Pacific, Huawei Cloud has established local teams in more than 10 countries to serve many large corporations, such as Siam Commercial Bank (SCB), Thailand's second largest commercial bank, and CT Corp, Indonesia's top consortium. Huawei Cloud has become a partner of choice for enterprises undergoing digital transformation. In November 2022, Huawei Cloud launched the Indonesia Region, creating the beginnings of a solid cloud foundation for a digital Indonesia with our industry- and sector-specific strategies.

In Latin America, Huawei Cloud launches and updates over 40 services every year, making us the fastest local cloud provider in terms of launch speed. We provide high-quality cloud services for local customers, covering the finance, media, retail, logistics, and Internet sectors. In 2022, the number of Huawei Cloud users in Latin America more than doubled, and the number of partners increased by over 90% year on year.

In Southern Africa, Huawei Cloud provides cloud services in 14 countries, which have attracted customers from more than 50 African countries. We have made rapid progress in the government, telecommunications, finance, manufacturing, and mining industries. In Northern Africa, Huawei Cloud has set up local service teams in more than 10 countries and has become a preferred partner for government and enterprise customers undergoing digital transformation.

In the Middle East, the infrastructure provided by the Huawei Cloud Abu Dhabi Region, which was launched in 2021, in combination with local support teams, helps Huawei Cloud respond to customer requirements more rapidly. Huawei Cloud provides intelligent twin services, such as city governance and smart healthcare, to large government and enterprise customers. In 2022, we grew alongside these enterprises and partners, with our cloud customer base in the Middle East more than doubling.

In Europe, Huawei Cloud adheres to a "By Local, For Local" philosophy, and works with its partners to serve more than 3,000 enterprise customers. In 2022, Huawei Cloud launched its Ireland Region, which will become a cloud hub for global enterprises. The Ireland Region will also serve as a launchpad for global enterprises to tap into the European market, and for European enterprises to access the global market.

Huawei Cloud Continuously Innovates to Build a Solid Foundation for Industries

Huawei Cloud never stops innovating. By leveraging over three decades of technological achievements and ICT expertise, we are proud to provide customers, partners, and developers with reliable, secure, and sustainable cloud services.

In 2022, Huawei Cloud released KooVerse, our global cloud infrastructure, which provides computing, storage, networking, and security services on a single unified architecture. KooVerse uses a three-layer architecture consisting of CloudOcean, CloudSea, and CloudLake to create a 50 ms experience circle capable of meeting the different latency requirements of enterprise business. By the end of 2022, KooVerse had been deployed in 75 availability zones (AZs) across 29 Regions to serve more than 170 countries and regions. In these countries and regions, enterprises can access Huawei Cloud services and resources with just one click, enabling them to grow their global businesses without building their own data centers.

In addition, Huawei Cloud launched DevCloud, which integrates the capabilities of the ModelArts AI development pipeline, the MetaStudio digital content production pipeline, the DataArts data governance pipeline, and the CodeArts software development pipeline. These pipelines support collaborative development and on-demand orchestration of AI models, data, digital content, and applications. They enable application developers, data engineers, and AI scientists to work on the same platform and share R&D capabilities and assets. By facilitating more efficient collaboration between teams, applications can be modernized more quickly.

ModelArts: An AI development pipeline lowering the barriers to industry-specific AI application development

ModelArts is a one-stop AI development platform that provides end-to-end AI application development capabilities, including data processing, algorithm development, model training, model management, and model deployment. ModelArts makes it easier for enterprises to carry out professional AI development and stable, reliable AI operations.

In 2022, Huawei Cloud dived deeper into three specific AI technologies that can be quickly integrated with industries: pre-trained foundation models, AI solvers, and knowledge computing.

Based on the Pangu foundation models, Huawei Cloud also launched models for drug molecule research, meteorology, and wave prediction, allowing different industries to have access to new advanced algorithms and solutions. In the coal mining industry, the Pangu mining model makes developing models for mining, excavation, electromechanics, transportation, and communications much faster. In 2022, the Pangu mining model was officially put into commercial use by Shandong Energy Group, paving the way for large-scale AI application in mining scenarios. In the meteorological field, the Pangu weather model can predict the global weather events a week in advance in mere seconds. These predictions are 20% more accurate than traditional forecast methods.

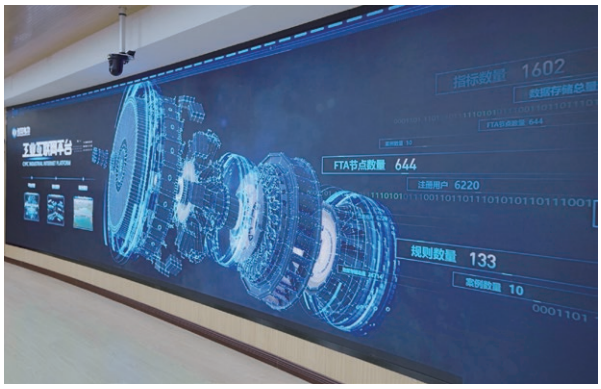
At the same time, Huawei Cloud is continuing to innovate and upgrade the OptVerse AI Solver. We are constantly launching new easy-to-use smart modeling tools that are based on industry scenarios. These modeling tools have made solver modeling speed 30 times faster, and lowered the threshold for enterprises to be able to use solvers. In the port sector, Huawei Cloud's OptVerse AI Solver is helping Tianjin Port coordinate plans based on tens of millions of variables and constraints more than 100 times faster, greatly improving operational efficiency.

The Pangu drug molecule model significantly shortened the R&D cycle of lead drugs and as a result, Professor Liu Bing of the First Affiliated Hospital of Xi'an Jiaotong University was able to develop a new broad-spectrum antimicrobial drug in just one month, an achievement that would normally take several years.

MetaStudio: A digital content production pipeline to bolster media productivity

MetaStudio, which is based on the graphics engine and space engine, provides five platform capabilities that make digital content production more efficient: 3D model production, asset management, content editing, physical simulation, and cloud rendering.

In 2022, Huawei Cloud released MetaEngine, a cloud native intelligent rendering engine which combines cloud, AI, and computer graphics technologies to drastically improve rendering efficiency in multiple industry scenarios. MetaEngine comes equipped with the most important graphics rendering features, such as immersive content presentation in the digital world and digital twin mirroring in the physical world. For example, it used to take six months to render a 90-minute 3D movie offline, but with Huawei Cloud's rendering service, this can be done in two weeks, and with MetaEngine, it can be done in just one week.



The China Three Gorges Group (CTG) built a unified cloud computing platform based on Huawei Cloud Stack. The cloud helped CTG deploy resources in a cost-effective manner. CTG used Huawei Cloud's DataArts Studio for its data governance center, unifying the device-side data collection process. CTG also used Huawei Cloud's FusionInsight MapReduce Service (MRS) to collect and analyze the data from China Yangtze Power and six other power plants in real time. As a result, CTG has been better able to unleash the value of massive data and safeguard the operation of the dam in real time.

DataArts: A data governance pipeline at the foundation of digital transformation

DataArts is a one-stop platform for data intelligence development and governance. It provides a range of cloud services to support enterprises as they unleash the full potential of data while also navigating the challenges that come with implementing data intelligence in compliance with strict data governance requirements.

Huawei Cloud's databases build core cloud native capabilities that are serverless, regionless, and modeless. Currently, Huawei Cloud GaussDB has been used in service applications by more than 2,500 large enterprises. For example, the next-generation distributed core system of the Postal Savings Bank of China, which is based on GaussDB, processes 2 billion transactions per day for more than 600 million individual customers. The new system made online transaction processing twice as efficient, and the batch processing efficiency increase by 33%.

The Huawei Cloud GaussDB (DWS) data warehouse, which supports millisecond-level real-time analysis, second-level interactive analysis, minute-level batch analysis, and IoT time series analysis, is capable of providing one-stop data analysis services in all scenarios for enterprises' digital transformation.

Huawei Cloud's FusionInsight intelligent data lake provides a big data cloud service portfolio. This cloud native lakehouse is capable of batch-stream integrated analysis and has accelerated the digital transformation of more than 3,500 customers across the government, financial, telecommunications, and Internet sectors. It has been used by multiple large organizations, such as the Industrial and Commercial Bank of China and the Bank of Communications, to build modernized data platforms. Based on the full-link, real-time, batch-stream integrated processing data lake solution, year-end profit and loss calculations can be made much more efficiently, unlocking the value of customer data faster.

CodeArts: A software development pipeline for agile and secure application modernization

CodeArts is a holistic, secure, and reliable cloud native DevSecOps platform that leverages over 30 years of Huawei's R&D practices and our explorations of the latest cutting-edge technologies. It covers typical development scenarios such as web, mobile, microservice, cloud native, and embedded applications.

CodeArts includes a variety of tools, including CodeArts Req for requirement management, CodeArts Check for code check, and CodeArts TestPlan for test management. CodeArts supports more than 20 mainstream programming languages, including C/C++, Java, Python, GO, JS, CSS, HTML, and PHP. It has more than 7,000 embedded code check rules, supports

full-lifecycle security management, and has unique distributed build capabilities. These features synergize, reducing the time it takes to build hundreds of millions of lines of code to less than one hour.

Chang'an Automobile used CodeArts to build a low-code development platform positioned specifically for the automobile industry, covering scenarios such as planning, production scheduling, and business budgeting. This low-code platform transformed the efficiency of Chang'an Automobile's business innovation activities, with development efficiency increasing by more than 40%, and labor cost falling by about 30%.

Huawei Cloud is Committed to Building a Digital Ecosystem that Champions the Growth of Partners and Developers

In 2022, Huawei Cloud grew rapidly alongside developers and partners. Over the past year, the number of Huawei Cloud developers globally increased from 2.6 million to more than 4 million, the number of partners exceeded 41,000, and the number of products in the KooGallery marketplace grew to over 10,000. In addition, Huawei Cloud remains committed to the notion of building an ecosystem of all, by all, and for all. Our cloud is an ecosystem that aggregates the applications of numerous industries, and a platform that empowers partners and developers around the world.

Huawei Cloud MacroVerse aPaaS: Tapping into shared excellence without reinventing the wheel

Huawei Cloud has distilled Huawei's years of collaborative innovation with partners across industries and experience in digital transformation into a cloud platform. We call this platform the MacroVerse application platform as a service (aPaaS). Developers can easily tap into this expertise through API services which can help them tailor innovation to industry scenarios.

By the end of 2022, Huawei Cloud had released core aPaaS services such as KooMessage and KooMap and scenario-specific aPaaS for seven industries: Industrial aPaaS, Heating aPaaS, Government aPaaS, Mining aPaaS, Education aPaaS, Electricity aPaaS, and Roadway aPaaS. We also launched the KooGallery marketplace. The Huawei Cloud MacroVerse aPaaS has made more than 50 scenario-based cloud services and over 100,000 API services available, and these have been, and continue to be, widely used in more than 10 vertical industries. Ningbo Communications Investment used our Roadway aPaaS for rapid accident identification and intelligent traffic predictions. This aPaaS is capable of accurately detecting more than ten different types of traffic accidents and providing guidance in each scenario.

The Electricity aPaaS helped the State Grid Corporation of China (SGCC) build a digital converter station platform. Based on this platform, SGCC reconstructed nearly 60 of its converter stations. Through AI-assisted fault analysis, faults on these converter stations now can be intelligently located, with an over 30% higher locating accuracy.

Building a new, competency-based partner system for shared success

In June 2022, Huawei Cloud released two new partner frameworks focusing on partner competency: GoCloud and GrowCloud. The GoCloud collaboration framework aims to cultivate and develop partner capabilities, and help partners build a rich portfolio of products, solutions, and services on Huawei Cloud, in order to ultimately create more value for customers. The GrowCloud collaboration framework is designed to help partners expand their customer bases, accelerate sales growth, and achieve win-win business results.

Huawei Cloud provides collaboration support for partners based on the unique roles they play, whether they are system integrators, software partners, service partners, device partners, learning partners, or distributors. Partners can choose one or more roles they fill as they join the GoCloud and GrowCloud frameworks so that the frameworks best serve the direction they want their business to develop in. The collaboration frameworks also help our partners develop their own unique capabilities and create opportunities for business collaboration.

A cloud of empowerment: Putting developers front and center

Developers are the mainstay of the Huawei Cloud ecosystem, so it is important we put them at its front and center. To this end, Huawei Cloud strives to empower developers by providing them access to cutting-edge technologies, platforms, experiences, and multi-ecosystem collaboration. By the end of 2022, there were more than 4 million global Huawei Cloud developers working in multiple technical fields such as software development, AI, data, media services, and IoT.

In 2022, Huawei Cloud invested US$100 million into upgrading the Huawei Cloud Developer Program. Currently, the Program has attracted over 3,000 enterprises, produced more than 2,300 joint solutions, and certified more than 16,000 developers. In addition, the company runs the Huawei Developer Competition which has two main categories: cloud foundation and industry. The Huawei Developer Competition attracted more than 15,000 developers and 2,500 teams from over 40 countries and regions. Huawei has also built local developer innovation centers in cities across China, such as Dongguan and Xiamen, to enable and support local industry development.

Digital Power Business

Carbon neutrality has become a globally acknowledged mission. It will drive an extensive and profound transformation in both society and the economy. Decarbonization and digitalization, two key trends in this transformation, will be crucial for sustainable development.

Huawei Digital Power is committed to integrating digital and power electronics technologies and converging energy and information flows, in order to manage watts with bits and drive the transition towards a green and low-carbon energy industry. We focus on providing differentiated green and intelligent products and solutions in domains like clean power generation, mobility electrification, and green ICT power infrastructure. We are also working with our customers and partners to build low-carbon households, buildings, factories, campuses, villages, and cities more quickly and support faster low-carbon development in other scenarios. This will ultimately support the shift to a carbon-neutral world.

By the end of 2022, Huawei Digital Power had helped customers generate 695.1 billion kWh of green power and save 19.5 billion kWh of electricity. These efforts have offset 340 million tons of CO_2 emissions, which is equivalent to planting 470 million trees.

Clean Power Generation

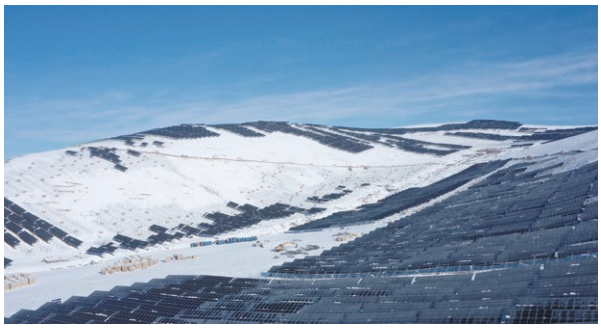
In terms of clean power generation, we have launched smart PV and energy storage solutions that address three main scenarios: utility-scale plants, commercial & industrial (C&I), and residential.

- For utility-scale plants, our solutions can accelerate the reduction of the levelized cost of electricity (LCOE) over the lifecycle of PV plants, enhance the safety of PV and energy storage plants and their support for power grids, and rapidly help make solar a primary energy source.

- For C&I scenarios, we have launched the C&I Smart PV Solution 2.0 with a "1 + 3" design, where "1" refers to a smart PV controller and "3" refers to a smart module controller, a smart string energy storage system (ESS), and a smart PV management system. This solution intelligently supports active safety, high reliability, optimal electricity costs, and smart O&M.

- For residential scenarios, we have created a Residential Smart PV Solution with a "1 + 4 + X" design that supports superior safety, one-stop convenience, and inspired user experiences. Featuring a smart PV controller ("1") that connects with a smart module controller, a smart string ESS, a residential electric vehicle (EV) charger, and a smart PV management system ("4"), this integrated solution enables a smart power consumption ecosystem ("X").

Through continuous innovation, we aim to lead and promote the development of the smart PV industry and make green power a primary energy source for every home and organization.



The construction of the Kela PV plant, the first phase of the Lianghekou Hydropower Station's hydro-solar hybrid project on the Yalong River, began in July 2022. This hybrid power plant project will be located at an altitude of 4,000-4,600 meters, the highest of its kind in the world, and will have the world's largest installed capacity. The Kela PV plant will have an installed capacity of 1 GW and will offer an annual average energy yield of two billion kWh. It is expected to connect to the grid at full capacity in 2023. Once the plant is up and running, it is projected to save more than 600,000 tons of coal equivalent each year, which can offset more than 1.6 million tons of CO_2 emissions. This plant will become a prime example of how PV can help promote local industries such as agriculture and animal husbandry, tourism, and transportation, while also boosting local infrastructure and creating more employment opportunities.

The Sembcorp Energy Storage System spanning two sites on Singapore's Jurong Island plays a significant part in supporting Singapore's transition towards cleaner energy sources. The system is the fastest of its size to be deployed in the world. On the Banyan site, Huawei provided the Smart String ESS technologies, supporting the provision of grid ancillary services.

The distributed PV project on the rooftop of the Kunming Administration Center in Chenggong District, China, has used Huawei's smart PV solution. It has a total installed capacity of 1.46 MW and offers an annual average energy yield of 1.865 million kWh. The offices in the administration center consume 95% of all the energy produced by the PV project, and all surplus power is fed back into the grid. The PV project can offset over 1,500 tons of CO_2 emissions every year, which is equivalent to planting more than 300,000 trees. This project showcases the benefits of rooftop PV systems for greener public services in Kunming.

Mobility Electrification

As electrification accelerates in the mobility industry, we are focusing on the ePowertrain, on-board charging system, and DriveONE-Cloud battery management system for EVs. We aim to provide competitive DriveONE eMobility products and solutions for carmakers and partners, and redefine the EV travel experience in terms of charging, range, power, and safety.

- Charging: Our 800 V high-voltage platform can support 200 kilometers of range after just a 10-minute charge. Moving forward, we will work on kilovolt-level flash charging platforms, making EV charging as easy as refueling.
- Range: Huawei DriveONE improves ePowertrain efficiency through precise thermal design, high-efficiency components, and high-efficiency electric drive control algorithms. These features work together to increase vehicle efficiency to 92% according to the China light-duty vehicle test cycle (CLTC) and boost range by about 5%.
- Power: Our high torque output motor and precise intelligent oil cooling system can allow a car to accelerate from 0 to 100 km/h under just 4 seconds, offering users an inspired driving experience.
- Safety: DriveONE-Cloud can provide early warnings about battery thermal runaway 24 hours in advance, making vehicle batteries safer.

Huawei positions itself as an eMobility component provider, and aims to help carmakers build better vehicles and improve the driving experience. Going forward, we will continue to develop an open ecosystem, and work with carmakers and industry partners to promote the quality and sustainable development of the automotive industry and enable electric and intelligent mobility.

Green ICT Power Infrastructure

Data center facility

Huawei has developed three scenario-specific solutions for large data centers, small- and medium-sized data centers, and critical power supply, in an effort to build data center facilities that are sustainable, simplified, autonomous, and reliable. By doing so, we want to accelerate the transition towards low-carbon and intelligent data centers.

- Large data centers: PowerPOD 3.0 is a worry-free power supply and distribution solution that reduces footprint and saves power and time, setting the trend for deep integration and innovation in power supply and distribution systems.
- Small- and medium-sized data centers: FusionModule2000 6.0 is a one-stop solution for small- and medium-sized data centers, leading the trend of modular equipment rooms.
- Critical power supply: Our uninterruptible power supply (UPS) solution series feature high reliability and efficiency, bringing high-density and high-efficiency power supply to new heights.

Huawei has also worked with third-party organizations to publish several industry standards, such as the *Code for Prefabricated Power Modules of Data Centers* (a social organization standard) and the *Technical Standards of Lithium-ion Battery Equipment for Data Centers*. All of our efforts are aimed at contributing to a green and sustainable data center industry.

We remain committed to "being integrated" and working with channel partners. In November 2022, we released the *Huawei Data Center Facility Global Ecosystem Policy 1.0*, in order to empower our partners and create a new data center ecosystem.

noris network's data center in Nuremberg, Germany uses Huawei's SmartLi UPS power supply and distribution solution. Our solution takes up about 70% less space than a conventional solution, eliminates the need to replace batteries throughout its lifecycle, and delivers a 35% lower total cost of ownership (TCO). A combination of these factors makes the data center more sustainable.

The China Three Gorges Corporation (CTG) has partnered with Huawei to build the Dongyuemiao Data Center, which will become the largest green, net-zero carbon data center cluster in central China. Once all three phases of the project are complete, the data center will house 26,400 racks, spanning over 100,000 square meters. Huawei's overall L0 + L1 solution can keep the annual power usage effectiveness (PUE) within 1.25 and reduce the power supply and distribution footprint by about 40%, enabling the data center to house over 500 extra racks. In addition, this solution can cut the time-to-market by about 50% compared with traditional data center construction practices. These factors work together to enable rapid deployment and efficient cooling and power supply, promoting the quality development of the digital economy.

Site power facility

Leading carriers from around the world are actively taking measures to conserve energy and reduce carbon emissions. Huawei is doing its part to help, and has launched low-carbon site power solutions for a wide range of scenarios, including one cabinet one site, one blade one site, simplified CO-eMIMO power for equipment rooms, iSolar, CloudLi ESS, and NetEco site power management system. These solutions are dedicated to helping carriers upgrade their networks without additional energy OPEX and achieve carbon neutrality. Ultimately, we aim to build a low-carbon site power target network that supports simplified site construction, green power supply, and intelligent site operations.

- Network construction: Our site power solutions can replace equipment rooms with cabinets and cabinets with poles, increasing site energy efficiency from 60% to about 97%. As for central offices, our simplified CO-eMIMO power solution allows for all-in-one cabinets and enables smooth capacity expansion without adding new equipment rooms, thereby increasing energy efficiency from 55% to about 75%.
- Power supply: Our industry-leading iPV and PV plus CloudLi ESS technologies can help improve both the yield and utilization of energy from PV systems, making green power a primary energy source for ICT networks. For telecom sites with no mains supply or an unstable mains supply, we replace diesel generators with solar power, helping customers reduce both fuel costs and carbon emissions.
- Site operations: Huawei uses intelligent CloudLi ESSs instead of lead-acid battery systems at sites. We also use proprietary technologies such as intelligent peak staggering to help carriers maximize the value of energy storage assets and reduce electricity costs. In addition, our NetEco site power management system allows site power facilities to run autonomously and enables customers to manage carbon emissions on a dashboard, further slashing site O&M costs and carbon emissions.

Turkcell, a Turkish carrier, has adopted Huawei's simplified cabinet and iSolar solutions to build green sites. Each of its sites will save about 19,000 kWh of electricity each year, offsetting carbon emissions by nearly seven tons.

Huawei Digital Power is implementing an ecosystem strategy that promotes openness and collaboration. We constantly pursue innovation, and are working with our global partners to create an open and symbiotic digital power ecosystem that thrives on shared success. We continuously empower our partners to improve their capabilities, and work with them to provide better services to our customers. We also actively participate in standards organizations, industry alliances, and industry associations, and work with our partners to promote product and technology innovations, drive industry consensus, as well as facilitate the formulation and implementation of relevant standards and specifications. All of these efforts are aimed at driving the healthy development of the industry.

Consumer Business

In 2022, Huawei's Consumer BG continued to deliver a Seamless AI Life experience to consumers worldwide by focusing all of its work firmly on consumers, accelerating transformation towards ecosystem-based development, and enhancing the visibility and presence of Huawei devices across all scenarios. Specifically:

- The HUAWEI Mate 50 Series was launched on schedule and reinforced Huawei's status as a premium phone brand.
- Constant innovation led to numerous breakthroughs in our "+8" domains including PCs, tablets, wearables, and IoT devices.
- HarmonyOS became the fastest-growing smart device operating system ever and cemented itself as the foundation of a flourishing ecosystem for a fully connected world.
- Under the Huawei Zhixuan model, three new models were launched as part of the intelligent AITO electric vehicle brand: AITO M5, M7, and M5 EV. The AITO series has set multiple records for the delivery growth of intelligent electric vehicles.
- Thanks to our breakthroughs in the smart home domain, our smart home products received accolades from an increasing number of consumers.

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

Huawei has consistently pursued a "1 + 8 + N" Seamless AI Life strategy for several years now. This strategy is centered on smartphones: "1" represents mobile phones; "8" represents tablets, PCs, VR devices, wearables, HUAWEI Vision products, smart audio, smart speakers, and head units; and "N" represents ubiquitous IoT devices. Through continuous innovation, we aim to deliver a seamless, intelligent experience to consumers across five major scenarios: Smart Office, Fitness & Health, Smart Home, Easy Travel, and Entertainment.

The new HUAWEI Mate 50 Series, which was launched in 2022 and comes equipped with a range of cutting-edge technologies, continues the proud legacy of the Mate series, and delivers the ultimate user experience.

"CAT", a photo taken by Cai Zehong (China) using the PORSCHE DESIGN HUAWEI Mate 50 RS

"FORCE" by Adão Filipe Fernandes Salgado (Portugal), a winner at the HUAWEI NEXT IMAGE Awards 2022

Smartphones

Huawei's Mate series has been pushing the boundaries of technological innovation and revolutionizing user experiences with cutting-edge technology, and as a result, has become synonymous with high-end flagship phones. The HUAWEI Mate 50 Series, a prime example of high-end flagship smartphones, is a fitting tribute to a decade of Mate innovation:

- The phones were the first consumer smartphones to support BeiDou Satellite Messaging.
- The phones were the first smartphones to be reinforced with "Kunlun Glass", making them 10 times more drop resistant[1].
- The phones feature an Ultra Aperture XMAGE Camera, which boasts the first-ever 10-size adjustable physical aperture and the most versatile photography capabilities ever seen on a Mate smartphone, allowing users to easily create masterpieces on their phones.

Huawei builds on a longstanding commitment to excellence in mobile imagery, differentiates itself in this domain, and continues to lead industry innovation. In 2022, Huawei launched its new mobile imagery brand XMAGE. Since then, we have used technology to enhance art and developed our distinct XMAGE style, building on the work of our seven research centers and eight research domains, as well as numerous images taken with Huawei smartphones. XMAGE offers consumers worldwide a new shooting paradigm and delivers a unique and extraordinary experience in mobile imagery.

As a pioneer of foldable phones, Huawei has constantly broken through technical bottlenecks and won consumer trust and support. The HUAWEI Mate Xs 2, launched in 2022, is an ultra light, ultra flat, and super durable flagship foldable. It features an innovative double-rotating falcon wing hinge, a composite screen structure, and an adaptive UI engine, taking the quality of foldable phones to a new level. The HUAWEI Pocket S, the first product in the Pocket series of foldable phones, adopts industry-leading folding technology, features an elegant, compact, and stylish design, and is available in six appealing and trendy colors, offering more options to fashion-conscious users.

[1] Based on results from the Huawei lab standard freefall drop test which compared the Kunlun Glass version of the HUAWEI Mate 50 Pro to regular glass versions. Since the phone contains precision components, please avoid bumping or dropping.

Smart Office

Huawei continues to develop two core capabilities – multi-device collaboration and ecosystem integration – in order to bring consumers brand-new smart office experiences that make creation and communication free and easy:

- In terms of multi-device collaboration, the Super Device feature centers on PCs and allows for easy drag-and-drop connections between any devices, maximizing productivity. Super Device is now available on a wider range of devices, including printers and earphones, and supports more scenarios like content creation, smart conferencing, efficient work, and learning from home.

- In terms of ecosystem integration, by the end of 2022, the HUAWEI Mobile App Engine, which brings consumers a new computer experience by allowing them to use mobile apps directly on their PCs, had over 60,000 apps available. We also offer the PC App Engine, which enables users to enjoy the professional PC ecosystem on their tablets.

The HUAWEI MateBook X Pro is Huawei's next-generation flagship laptop. It features an industry-leading metallic body that is ultra-thin and skin-soothing, as well as strong performance powered by Super Turbo. The laptop ensures universal color consistency on every screen, thanks to the Universal Colour Consistency feature, and supports features like Super Device and SuperHub. Users can simply drag to wirelessly project their laptop on a HUAWEI MateView monitor to enjoy a big-screen view and boost productivity. Documents can be seamlessly transferred between the laptop and a Huawei tablet or phone, making work smarter.

Our new flagship tablet, the HUAWEI MatePad Pro, is one of the lightest 11-inch tablets available[2]. It also boasts an extremely high screen-to-body ratio. Combined with the upgraded HUAWEI M-Pencil, the HUAWEI Notes app, and other productivity-enhancing features, the tablet delivers an undeniably professional experience.

HUAWEI Browser pools information from a variety of media platforms and intelligently recommends trustworthy content and information to users. The HUAWEI Newsfeed Connect attracts more than 300 million views each day. HUAWEI Books, when used together with the HUAWEI MatePad Paper tablet, delivers a paper-like reading experience, and users only need to sign in with their HUAWEI ID to enjoy a seamless reading experience across a wide range of devices. The HUAWEI Mobile Cloud offers users secure and convenient personal digital asset management services, enabling data to freely move and sync between multiple devices through the cloud.

In 2022, the Consumer BG expanded its premium products and innovation capabilities from the consumer product domain to the business domain, striving to leverage its core capabilities in quality, intelligence, and reliability to deliver even better product and solution experiences and enable governments and enterprises to work more efficiently. We will continue to innovate to further improve creativity and productivity in the Smart Office domain.

Fitness & Health

Huawei has established a Fitness & Health Team, comprehensively upgraded its strategy in the fitness and health domain, and continued working on sensor technology and software algorithms in order to provide a complete range of digital health services. We also work with our ecosystem partners to build an intelligent digital ecosystem for fitness and health and provide consumers with more innovative smart wearables and experiences.

To meet the increasing demand for consumer health management products, our wearables support continuous health monitoring and management, covering heart rate, SpO2, stress, and blood pressure, as well as sleep tracking and ECG. The HUAWEI ECG App has been registered with China's National Medical Products Administration as a Class II medical device and has earned the EU's CE Medical Device Regulation (MDR) certification. In addition, we are working with medical institutions to provide a range of health monitoring and disease screening services in the respiratory, heart, blood pressure, and many other domains, in order to help consumers effectively manage their health.

We continue to innovate in the wearable domain. The HUAWEI WATCH GT 3 Pro features nanocrystal ceramics, bringing the beauty of technology to a new level. In addition, the HUAWEI WATCH GT Cyber and the HUAWEI WATCH Buds have set new trends and marked the start of a new chapter for wearables. Our extensive lineup of wearables, which also includes the HUAWEI WATCH FIT 2, the HUAWEI Band 7, and

[2] Compared to all 11-inch tablets launched before July 2022. Testing data from Huawei labs.

the HUAWEI WATCH KIDS 5X and 5X Pro, provides consumers with a vast array of options across all scenarios.

We also constantly deepen our collaboration with the industry, universities, and research and medical institutions. Based on the HUAWEI Research platform, we are working with partners on health research that covers a range of topics, such as heart health, sleep apnea, and respiratory health, creating enormous value for both the industry and users. In June 2022, our Fitness & Health Team launched three new health research projects in China that are dedicated to blood glucose, lung function, and high-altitude health. These projects will help users proactively manage their cardiovascular, respiratory, and endocrine health. By the end of 2022, over nine million users had participated in our health studies.

We will continue to provide users with end-to-end fitness and health monitoring and management services and strive to become everyone's go-to personal health manager through continuous technological innovation, in order to help users develop healthier lifestyles.

Smart Home

The HUAWEI SmartHome Solution, featuring a "1-2-N" architecture (where 1 stands for the host, 2 represents the two ways to interact, and N stands for N subsystems), unveils the Space 3.0 era and creates intelligent space experiences.

In 2022, we had 160 authorized smart home retail locations across 88 cities in China. We also actively drive the development of the digital home industry by participating in the formulation of multiple standards and partnering with multiple real estate developers. Our goal is to build at least one store and one showcase project in every major city, in order to accommodate today's consumers in the homes of the future, and enable them to live happier lives.

We have also launched a number of new products to delight our consumers:

- Our new Vision products, such as the HUAWEI Vision V Pro Series, instantly upscale 720p video to 4K video through Honghu Computational Picture. They also come with HUAWEI SOUND Computational Audio, providing users with a theater-like audiovisual experience. MeeTime calls allow users to catch up with their loved ones even when they are thousands of miles apart.
- The HUAWEI Gigahome dual-routers use PLC Turbo 2.0, the latest PLC technology, to deliver a strong signal to every room.
- The HUAWEI Smart Door Lock offers a wider range of more secure unlocking methods. Users can also use their phone as an intercom to monitor their door in real time. Many other useful features, such as Picture-in-Picture (PiP) on Vision products and doorbell notifications through smart speakers, are also available.
- The brand-new HUAWEI MemoSpace home storage device has been designed to meet users' demands for storing family data, syncing, managing, and searching for photos and videos, and working from home. The device also offers financial-grade privacy protection functions, safeguarding users' data and making it painless to access data.

Easy Travel

At Huawei, we continue to work towards fulfilling our mission of helping automobile manufacturers build better vehicles and sell more of them, giving consumers a superior smart travel experience.

Under the Huawei Zhixuan model, three new models were launched as part of the intelligent AITO electric vehicle brand: AITO M5, M7, and M5 EV. More than 75,000 AITO units were delivered between March 2022, when formal delivery began, and the end of 2022. The AITO series has set multiple records for the delivery growth of intelligent electric vehicles.

The AITO M5 and AITO M7 use a range extension system that allows users to flexibly shift between a purely electric mode and a range extension technology mode. AITO vehicles can achieve the same acceleration performance as fossil fuel cars with just half the fuel consumption. All AITO models come equipped with HarmonyOS Intelligent Cockpit, which has been deemed one of the best head units on the market by the industry and consumers for its intuitive, intelligent, and convenient cockpit experience. Our Petal Maps service is also available for cars, allowing navigation to seamlessly transfer between a smartphone and a head unit. HUAWEI Wallet provides a digital car key service that delivers financial-grade security protection.

In addition, the channel network for the Huawei Zhixuan model has taken shape. By the end of 2022, there were more than 1,000 user centers and experience stores across more than 230 cities in China, which continue to provide one-stop services for consumers.

Huawei follows a "1 + 8 + N" Seamless AI Life strategy to provide consumers with a seamless, intelligent experience across five major scenarios: Smart Office, Fitness & Health, Smart Home, Easy Travel, and Entertainment.

The HUAWEI HiCar solution has been integrated into the platforms of more than 40 automobile brands, providing an intelligent phone-cockpit interconnection experience for more than 10 million consumers. Additionally, our digital car key service has been launched by more than 10 automobile manufacturers. Over one million users can now lock and unlock their cars on their smartphones or smart watches. We have also teamed up with over 20 automobile manufacturers to provide users with intelligent in-vehicle services through HMS for Car, covering more than 12 million vehicles. Our in-vehicle mapping services have also been launched outside China.

Entertainment

HarmonyOS has reshaped the audio interaction experience, connecting all things that can be connected and allowing users to enjoy the nuances between various types of sound. HarmonyOS 3 enables smart audio transfer and MeeTime calls, creating a seamless, intelligent audio experience in all scenarios.

Our new flagship earbuds, the HUAWEI FreeBuds Pro 2, feature a unique Ultra-hearing Dual Driver system that intelligently coordinates two drivers with digital crossover technology, guaranteeing that they work in perfect unison. The earbuds deliver users an ultra-high definition audio experience and have earned HWA and Hi-Res Audio Wireless certifications.

The HUAWEI FreeBuds 5i features a stylish design, ultra-long battery life, and ultra-low latency, allowing users to enjoy innovative noise cancellation and audio quality technologies.

The HUAWEI Vision Glass projects a digital screen and brings an ultra-immersive cinematic viewing experience to users wherever they like, whether at home or on the go.

Our new flagship smart speaker, the HUAWEI Sound X Gilt Theater Edition, is made using an 18-karat gold plating process, features a three-way design with theater sound effect, and supports convenient interactions thanks to Super Device and other features.

The HUAWEI Sound Joy, our first portable smart speaker, features Devialet 4-unit punchy sound and supports 26-hour playback, generating exceptionally high sound quality for users anytime, anywhere.

In terms of apps and services, we continue to provide users with global music and video services. HUAWEI Music partners with a number of music companies and long-audio brands, and has launched the Spatial Audio Zone and Hi-Classical Zone, delivering a high-quality and all-scenario music experience. HUAWEI Video is a convenient one-stop video platform where users can watch enriching video content (i.e., movies, TV series, entertainment shows, and videos for children) from multiple mainstream video platforms. In addition, more than 1,500 movies that support up to 4K image quality, HDR Vivid colors, and Audio Vivid sound effects are available in the AiMax Cinema Zone, enabling users to enjoy cinematic masterpieces from the comfort of their homes.

Wider Use of HarmonyOS, Rapid Growth of the HarmonyOS Ecosystem

By the end of 2022, HarmonyOS had been deployed on 330 million Huawei devices. Over the past four years, HarmonyOS has evolved to deliver more powerful new functions and a user-friendly experience. HarmonyOS 3 was officially launched in 2022, representing a full expansion of the Super Device feature, which is now available on 12 different device types, including smartphones, tablets, PCs, HUAWEI Vision products, earphones, smart watches, and head units, facilitating effortless cross-device interactions.

The HarmonyOS ecosystem continues to grow by leaps and bounds. HarmonyOS Connect, the technology brand that supports the HarmonyOS ecosystem, has attracted more than 2,300 ecosystem partners and continues to add more product categories. In 2022 alone, over 181 million new devices in the HarmonyOS Connect ecosystem were shipped, covering numerous types of smart home appliances and providing users with more convenient access to the digital world.

Huawei has donated HarmonyOS's basic functions to the OpenAtom Foundation. This has created the OpenHarmony project, which will provide numerous industries with an open digital foundation. OpenHarmony is a very active open source project on Gitee, a code hosting and collaborative development platform. At the end of 2022, OpenHarmony ranked first on the Gitee Index and had already attracted more than 5,000 community code contributors. In addition, 94 development boards and modules, 28 software distributions, and 102 commercial devices had passed compatibility tests.

Huawei continues to share its innovative technologies and tools to help developers more efficiently build the HarmonyOS ecosystem. At the Huawei Developer Conference 2022, Huawei announced that HarmonyOS would fully adopt the declarative development paradigm and also upgraded the HarmonyOS development suite, which optimized the end-to-end process from design, development, and testing to release, helping developers quickly enrich the HarmonyOS ecosystem with more powerful tools.

By the end of 2022, there were more than two million HarmonyOS ecosystem developers. The thriving HarmonyOS ecosystem depends on a steady supply of trained software engineers, and so Huawei has worked with 208 universities in China, including the prestigious Tsinghua University, to offer HarmonyOS courses to more than 20,000 student developers. Through its school-enterprise partnership programs, China's Ministry of Education has supported 93 HarmonyOS ecosystem programs. The influx of student developers means the future of the HarmonyOS ecosystem is more promising than ever.

Huawei has curated a rich pool of apps and services through which it continues to deliver users worldwide a premium and minimalistic intelligent experience. By the end of 2022, the number of monthly active users of Huawei Mobile Services (HMS) had exceeded 580 million, and the number of monthly active users of HUAWEI ID, AppGallery, and Quick App had surpassed 420 million, 580 million, and 170 million, respectively. 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. In addition, Petal Search is available in more than 170 countries and regions outside China, and supports over 70 languages. Meanwhile, Petal Maps provides precise intelligent navigation services across more than 160 countries and regions outside China, including maps for smartphones and smart watches, as well as web maps.

The HarmonyOS app ecosystem flourished in 2022. By closely integrating software, hardware, chips, and the cloud, we have developed more simplified and reliable system apps that are essential for users. Our innovations in interaction methods across the HarmonyOS ecosystem have brought about a variety of service distribution models and apps to help users explore new possibilities in their lives. Our own content distribution platforms like HUAWEI Music, HUAWEI Video, and HUAWEI Browser enable users to easily access a wide range of entertainment and information across all scenarios.

We have also spared no effort to attract third-party premium apps to the HarmonyOS ecosystem and expand feature abilities (FAs). We have established extensive partnerships with numerous companies, including Sina, Alipay, Ctrip, and Qunar, to satisfy user requirements in areas such as productivity, social, and gaming. Within the HarmonyOS ecosystem, everything can be shared and provided as a service, delivering a compelling user-friendly experience to over 300 million HarmonyOS users. By the end of 2022, the number of FAs running on HarmonyOS-powered devices exceeded 50,000. HUAWEI Assistant•TODAY has gradually become the center of our users' favorite FAs.

We continue to increase investment in the HarmonyOS ecosystem and provide more related training. By enhancing AI search experiences across all scenarios and improving engine and map data capabilities, we can deeply integrate HMS Core and HarmonyOS to provide unified experiences, making it easier for developers to join the HarmonyOS ecosystem and facilitating its business success. More than six million developers worldwide have registered to join HUAWEI Developers, and over 220,000 apps have been integrated with HMS Core, constantly consolidating the fully connected, intelligent app ecosystem.

Upgraded Brand Image in Retail and Service Stores

We have continued to explore and develop premium retail and service models to improve Huawei's brand image and optimize customer experience at our retail and service stores. By the end of 2022, we had more than 60,000 retail stores, display zones, and display counters worldwide, including over 5,500 Huawei Authorized Experience Stores and 2,200 Huawei Authorized Service Centers. Our service centers cover 47 countries and regions. In 2022, global customer satisfaction with Huawei's services increased by 2.6 percentage points from 2021. We also organized targeted service campaigns such as Service Day, Service Giving Season, and Battery Replacement, which generated more than 1.5 billion consumer interactions.

We continue to build large HUAWEI Flagship Stores and HUAWEI Smart Life Stores in major cities around the world. These stores are designed to serve local consumers by providing superior immersive experiences across all scenarios and showcase how they can interact with their cars and homes. In 2022, there were 14 HUAWEI Flagship Stores globally, and more than 300 HUAWEI Smart Life Stores with an area of more than 500 square meters.

HUAWEI Flagship Stores are committed to continuously enhancing Huawei's brand image and exploring and providing the best possible retail experiences to consumers. In 2022, our flagship stores

started serving coffee to consumers, adding a human touch to interactions between Huawei and consumers. Consumers can also experience the accessibility features of Huawei devices in every flagship store, allowing visually or hearing impaired users to learn how to use Huawei devices and enjoy a digital life. Our flagship stores have also organized a variety of events for running and driving enthusiasts to boost engagement with consumers. HUAWEI Flagship Stores have become landmarks in their cities, and have been frequented by more than two million consumers.

HUAWEI Flagship Stores have become landmarks in their cities due to their outstanding designs. The HUAWEI Flagship Stores in Zone G of Huawei's campus in Bantian, Shenzhen, and at the center of the Wushang Dream Plaza in Wuhan opened in 2022. These stores also serve coffee, further enriching consumers' retail experience.

Enriching Life with Technology as a Responsible Corporate Citizen

Huawei has ramped up R&D investment into accessibility to develop more thoughtful accessibility features, such as AI subtitles, image recognition, and large font sizes. These features have won wide recognition from the rest of the industry:

- The HarmonyOS-powered HUAWEI P50 Pro ranked top in China Telecom's smartphone accessibility assessment in 2022.
- HarmonyOS 2.0 was the only five-star-rated OS according to the 2022 smartphone OS/UI elderly-friendliness ratings released by the China Telecom Research Institute.

To help visually impaired users more easily engage with the world around them, HarmonyOS 3 comes with an upgraded image recognition feature. Visually impaired users can use their phone camera to identify objects and text around them, and their phones can relay the features and locations of people or objects around them. For example, the phone might announce, "A man wearing a T-shirt is sitting in front of the desk, and there is a computer on the desk." The AI subtitle feature also helps hearing impaired users convert voice into text. In addition, phones powered by HarmonyOS 3 can quickly connect to hearing aids such as cochlear implants, allowing audio to be transmitted directly through hearing aids. The OS's Senior mode makes it easier and more convenient for elderly users to use smartphones. Features like Simple mode and the Magnification gestures perfectly meet their needs for volume, font size, responsiveness, and more.

Huawei develops technologies to expand access to education and meet the health requirements in the communities we serve. We are committed to creating a comprehensive online learning environment that integrates online education resources so that

high-quality education can be accessed by anyone, regardless of where they are. By the end of 2022, the HUAWEI EduCenter had teamed up with more than 240 partners to publish 660,000 courses. In addition, the multitude of courses available on the HUAWEI Developers Training platform had attracted more than 2.3 million enrollments. We have also continued to invest in basic research in the health domain. After seven years of development, for example, the HUAWEI TruSeen™ solution has been released to monitor vital signs and provide accurate, convenient, and fast health data monitoring so that consumers can more effectively manage their health.

Huawei incorporates the concepts of green development and environmental protection standards into all of its business development processes. We design our products in a way that minimizes dependence on hazardous substances to reduce the impact our products have on the environment. We prioritize the use of premium and eco-friendly renewable materials during manufacturing, and are proactively phasing out raw materials that contain hazardous substances. In addition, regarding product sales and distribution, we are working hard to improve our packaging and reduce the amount of plastic used in packing materials.

To drive the reuse of second-hand phones, we have worked with an industry-leading recycling partner to launch the official certification of second-hand phones. This certification process covers everything from the recycling, refurbishing, and resale of our second-hand phones. Between 2020 and 2022, we helped keep more than eight million devices in good working order by sending faulty components back to our high-level repair centers for repair. And from 2015 to 2022, nearly 600,000 used Huawei devices were distributed for reuse through our trade-in program.

Huawei has constantly worked to upgrade its privacy and security protection capabilities to provide all-round safeguards for consumers. HarmonyOS 3 provides an upgraded and visualized Privacy Center and Security Center and added an app control center to ensure that all apps run both optimally and securely. These centers make the security status of phones and sensitive permissions clearly visible. We have also launched privacy and security protection solutions targeting different scenarios and groups of people. For example, we have created an App Guard and Senior mode for the elderly to help them block risky apps and make it easier for them to use their phones. We have also made it possible for parents to create accounts for their children, and developed intelligent cockpits that fully protect the privacy and security of drivers.

Moving forward, the Consumer BG will continue to focus everything it does on helping consumers and creating new technologies that will make the Huawei brand synonymous with convenient and thoughtful services. We will strive to make Huawei the world's most trusted smart device brand, and make Huawei our users' first choice. Working with our partners worldwide, we will redouble our efforts to build a thriving HarmonyOS ecosystem and continue delivering a Seamless AI Life experience for our consumers.

Intelligent Automotive Solution Business

Huawei strives to become the world's preferred provider of new components for intelligent connected vehicles. We offer these components to car OEMs and industry partners to help car OEMs build better vehicles. Ultimately, we hope to enable the automotive industry to go electric, connected, and intelligent.

As vehicles become more intelligent, intelligent automotive components have gained traction in the market and are delivering brand-new user experiences. Intelligent driving and intelligent cockpits have become key differentiators for top-rated vehicles, and intelligent components are beginning to become standard in high-end vehicles in markets like China. These intelligent components include high-performance computing platforms, lidars, large displays, and multiple-display solutions. Intelligent features that were once only found in high-end vehicle models are now available in more and more affordable models, such as those in the CNY100,000 range.

As ICT technologies become more deeply integrated into the automotive industry, carmakers are also recognizing the importance of full-lifecycle services and cross-domain innovation and integration for vehicle R&D, both of which are becoming key factors for success.

Business Development

We are continuing to increase investment in the intelligent automotive solution (IAS) business, as it presents long-term strategic opportunities for Huawei. We have invested US$3 billion into our IAS BU since it was established and increased the unit's R&D team to 7,000 people.

We are working hard to provide customers and partners with high-quality products, including the 30-plus innovative intelligent automotive components we have already launched. These products meet automotive grade requirements for safety and security, reliability, durability, and more. By the end of 2022, we had shipped nearly two million of these components, which included products and solutions like intelligent cockpit, intelligent driving, intelligent electric power, intelligent vehicle cloud services, mmWave radars, cameras, gateways, lidars, computing platforms, augmented reality head-up displays (AR-HUDs), and T-Boxes.

In 2022, our intelligent driving solution enabled smooth experiences in three scenarios: urban driving, highway driving, and parking. We became the first to commercialize Navigation Cruise Assist (NCA) in urban areas, starting with Shenzhen and Shanghai. Our NCA is capable of supporting vehicles on highways across 259 cities in China, including intercity highways and urban expressways. As for parking, our Automated Parking Assist (APA) and Remote Parking Assist (RPA) products have also already entered commercial use. All of these efforts are aimed at making smart travel a reality.

Huawei does not make cars. Instead, we work with car OEMs using models like Huawei HI and Huawei Zhixuan. To date, we have established in-depth partnerships with many car OEMs, such as ARCFOX, AVATR, and SERES, to help them build better vehicles and achieve business success. Cars under the Huawei HI model, like the ARCFOX Alpha S HI model and AVATR 11, already saw mass delivery in 2022. And through our partnership with SERES, more than 75,000 units of three car models – AITO M5, M7, and M5 EV – were sold under the Huawei Zhixuan model in 2022. Each of these three car models offers drivers superior intelligent cockpit experiences.

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. To date, we have brought together more than 300 partners from across the automotive industry through the following three ecosystem platforms.

- The intelligent digital vehicle platform (iDVP) ecosystem has attracted more than 100 partners, and our iDVP has been 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 scenarios such as passenger cars, ports, mining trucks, and campuses.
- 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.

Huawei also actively participates in automotive industry alliances and contributes to industry standards and key technologies.

- Huawei has been deeply involved in the SparkLink Alliance, which is committed to driving innovation and creating an industry ecosystem for next-generation short-distance wireless communications technology. To date, the alliance has brought together more than 240 member organizations across the value chain. In November 2022, the SparkLink Alliance released the SparkLink 1.0 standards focusing on the SparkLink Basic (SLB) and SparkLink Low Energy (SLE) technologies, which will build end-to-end core SparkLink functions that feature both high-speed, high-quality connections and lightweight, low-power connections.
- As a founding member of the Software-Defined Vehicle (SDV) Working Group of the China Association of Automobile Manufacturers, Huawei actively pools wisdom from across the industry to drive consensus and contribute to industry standards. In June 2022, the SDV Working Group and more than 100 member organizations jointly released the third edition of *Reference Specifications for Software-Defined Vehicle Service APIs*, in order to promote industry collaboration and address common industry issues. By June 2022, the SDV Working Group had published more than 400 atomic service APIs and more than 300 device abstraction APIs.

Safety and Security Certifications

Huawei pursues a zero-defect quality system that ensures safety and security for all of its customers and users. We invest heavily in R&D, testing, manufacturing, supply, processes, and more to quickly build up these end-to-end systems.

- Our intelligent driving operating system (AOS), intelligent vehicle control operating system (VOS), advanced driving solution (ADS), advanced intelligent sensing (AIS), intelligent electric power, and other related products have all passed ASIL-D – the highest certification for functional safety assessment.
- Our intelligent vehicle cloud services have received the Automotive Software Process Improvement and Capability Determination (ASPICE) certification and met all Volkswagen KGAS criteria (Group Basic Software Requirements).
- For HD maps, Huawei has been granted Class-A qualification for surveying and mapping in China.
- Huawei IAS BU has received ISO/SAE 21434 certification for automotive cyber security, and IATF 16949 quality management system certification from TÜV Rheinland.
- Huawei's AOS and VOS were among the industry's first to complete the testing and certification of intelligent connected vehicle control operating systems.

Industry Recognition

In 2022, Huawei's intelligent cockpit and intelligent driving solutions won multiple industry awards, setting new industry benchmarks.

- Our intelligent cockpit solution won two awards at the World Intelligent Driving Challenge: Top Intelligent Cockpit Award and Extreme Challenge Award.
- Our HarmonyOS Intelligent Cockpit voice assistant received the first level-1 certificate for an in-vehicle voice assistant in the automotive industry.
- The ARCFOX Alpha S HI model, equipped with Huawei's advanced driving system, ranked No.1 in the Xuanyuan Award's smart driving list while dominating in the driving assistance, parking assistance, and intelligent driving interaction categories. This makes the car a veritable benchmark in the intelligent driving industry.

Research and Innovation

Scientific exploration and technological innovation drive civilization and society forward. Huawei understands the importance of research and innovation and how openness is critical for both. We are ready and willing to work with academia and industry to explore the frontiers of science and technology, push innovation forward, create value for industry and society as a whole, and build a better intelligent world.

Basic Research: Overcoming Theoretical and Industry Bottlenecks with Patient Investment into Communications and Computing

- Mathematics is the queen of the sciences and key to the new world of communications, computing, and AI. For this reason, Huawei consistently conducts research into mathematical theory and its applications.
  - In the field of random matrix theory and algorithmics, we created a new method of estimating the minimum singular value of an n × n random matrix of a sparse linear system by running an algorithm in $\widetilde{O}\left(n^{\frac{3\omega-4}{\omega-1}}\right)$ time where ω is the matrix multiplication exponent. The paper that elaborates on this method was accepted in 2022 by the Annual ACM Symposium on Theory of Computing (STOC), the flagship conference of the Special Interest Group on Algorithms and Computation Theory.
  - In terms of training deep learning models, we proposed the Boolean logic backpropagation method. This breakthrough in mathematical principles helps solve problems related to hyperdimensional binary variable optimization and makes it possible to both conduct deep learning algorithms in the Boolean field and

realize the performance of a full-precision model through simulated verification.

- In the field of topos theory and semantics, we put forward a brand-new mathematical theory for semantic learning, creating a public framework for algebraic topology and logical propositions. We also proposed the world's first semantic information spaces based on groups, partially ordered sets, and groupoids, which explains well the experimental results of Roger N. Shepard, Carl I. Hovland, and Herbert M. Jenkins. The experiment shows that the new neural network model is not just a "statistical parrot" as it can reach a more animal-/human-like intelligence.

- We have also dived deep into communications and computing theories, constantly exploring, challenging, and approaching the theoretical limit.
  - In the field of information theory, we put forward a coding method based on multilateral coupling graphs. This method allows us to increase performance by about 0.5 dB in optical communications scenarios at a Tbit/s-level speed over thousands of kilometers, bringing us closer to the Shannon limit.
  - We have consistently pushed the limits of entropy coding with our unstructured data coding algorithm HZU, through which we discovered the fast nonlinear transformation and lightweight context prediction method. This algorithm can generate results superior to those of the Lempel-Ziv (LZ) compression paradigm and boost the compression ratio by about 30%.
  - In the field of network optimization, we created a topology-aware network pricing policy (NPP) model and a self-adaptive sparse optimization method to solve problems surrounding flows in networks that possess hundreds of thousands of nodes and tens of millions of links, improving problem-solving speeds by orders of magnitude. We also proposed the CLIModel based on the biological assimilation mechanism, improving network configuration efficiency by over five times. The paper on this model has received a Best Paper Award from ACM SIGCOMM 2022.
  - In the field of computing and AI, we introduced an allocation and scheduling method capable of minimizing communications costs and maximizing task-level parallelism in a weighted manner. Based on this method, we built Fold3D, a three-dimensional parallel training framework that delivers performance 25% higher than mainstream industry systems.
  - In the field of machine learning, we were the first to prove that analytical solutions existed for the optimal Kullback-Leibler (KL) divergence and optimal reverse variance of the diffusion probabilistic model (DPM). Such a breakthrough has the potential to improve sampling efficiency by 20- to 80-fold, and therefore the related research paper has been presented the ICLR 2022 Outstanding Paper Award.

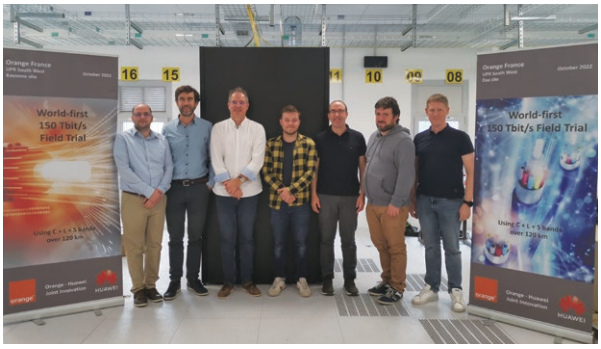
Technological Innovation: Driving Industry Development to Usher in a New World of 10 Gigabit Experience, 100 Billion Connections, and Native Intelligence

Wireless Networks

- We have been working with the global industry to explore and define 6G, and have also proposed six technology pillars for 6G.
- We place equal importance on theoretical innovation and prototype verification, and have unveiled the first 220 GHz terahertz communications prototype system with a peak rate of 240 Gbit/s.
- In terms of short-distance communications, we used mmWave to realize superb user experience featuring throughput of over 10 Gbit/s and a sub-millisecond latency.
- We created an innovative hybrid antenna array architecture that combines both reflective and reconfigurable surfaces, achieving a coverage gain of nearly 41 dB in the 10 GHz band in non-line-of-sight (NLOS) scenarios.
- We completed the world's first field trial verification of mobile access to low-earth orbit satellites based on 5G NR protocols, and also became the first to simultaneously realize high-speed communications and millimeter-level high-precision imaging in the terahertz frequency band while maintaining the same hardware and the same waveform.

Optical Networks

- We continued our work to increase the single-wavelength rate for long-haul transmission from 400 Gbit/s to 800 Gbit/s by diving into key technologies like low-complexity nonlinear waveform design for high-speed signals and 200-GBaud ultra-high-speed optoelectronic modulators.
- We also made breakthroughs in ultra-wide-spectrum S + C + L band optical amplifiers, next-generation higher-order modulation algorithms, and improved the performance equalization of wide-spectrum optical systems, expanding optical spectrum by 50%.
- During a joint on-site test with Orange, we set a new record of single-fiber 157 Tbit/s transmission over a distance of 120 kilometers.



The joint test team that set the record, with members from both Orange and Huawei Optical Communication Technology Lab in Paris.

Data Communication

- Our latest bus-level data center network (DCN) uses a novel architecture to enable the convergence of the Ethernet, Fibre Channel (FC), and InfiniBand (IB), achieving a breakthrough in high-performance computing network and storage network performance.
- We have continued to build next-generation Ethernet technology systems. By supplementing digital circuits with analog ones, we've reduced energy consumption by around 50%. By separating error detection from error correction, we've reduced interface latency by nearly 70%. By adopting flexible slicing, we've created private lines at n x 10 Mbit/s.

Intelligent O&M

- We have constructed an O&M pretrained foundation model (PFM) that unifies the representation of network element data and prevented siloed modeling for O&M. Compared with the previous models, each of which supported only one task, this new model can support multiple downstream tasks, such as fault data analytics, root cause analysis (RCA), responses to customer complaints, intelligent signaling analysis, and assistance for changes, while also greatly improving their efficiency.
- By employing a technology of optimizing ultra-large-scale wireless parameters in parallel, we have been able to increase the cell-edge rate of 5G downlink users by more than 10%.

Cloud and Computing

- As part of our work to address the performance and latency challenges presented by cross-chip and cross-server communications in heterogeneous computing, we have redefined the bus architecture for computing cluster communications and unified the interconnection standards between chips and nodes. This means the live migration of virtual machines can be performed in mere milliseconds, substantially boosting network efficiency.
- We launched the industry's first heterogeneous computing cluster software platform, improving computing resource utilization by over 35% and accelerating performance by more than 100% in scenarios like deep big data analytics and retrieval.

Consumer Business

- We launched our new mobile photography brand – XMAGE – to bring new portrait and night mode features to consumers through innovative mobile photography technologies.
- We've designed a unique double-rotating falcon wing hinge which, when combined with ultra-high-strength steel and flexible materials, makes foldable phones more durable, significantly lighter,

and enables them to retain their flat screens, regardless of how many times you fold them.

- By continuing our research into materials and production methods, we've made breakthroughs that have revolutionized phones. The sturdy Kunlun Glass has made our phones 10 times more drop-resistant, and one of our latest phone models, which was reinforced with Kunlun Glass, became the first to ever earn the five-star glass drop-resistance certification from Switzerland's SGS.

AI Algorithms

- We launched ZooD, a model library technology that supports search functionality. Powered by Ascend, MindSpore, and Huawei Cloud, this breakthrough improves model performance by over 30%. Our OptVerse AI Solver also made its debut in 2022, making it possible to solve optimization problems involving tens of millions of variables and constraints in multiple scenarios.

- For the first time, we realized compression via quantization of generative models, increasing their compression ratios by more than 10 times without affecting performance. The upgrade of the parallel distillation technology achieves a 100-fold increase in quantization speed, better supporting the deployment of Huawei Cloud's full-precision models that have hundreds of millions, tens of billions, or even hundreds of billions of parameters.

Foundational Software

We are continuing to patiently invest in foundational technologies that will deepen our roots in the software industry.

- By innovating on microkernel, storage, and scheduling architectures for operating systems, we have significantly increased the utilization of hardware resources.

- The groundbreaking accomplishments we have made in fusion storage engines, fully-encrypted databases, and AI-based optimizers through the introduction of GaussDB have sharpened our competitive edge in performance, security, and availability.

- We have remained committed to an open source strategy and keeping an open mind while building software ecosystems. Through our cooperation with players across the industry, openEuler, openGauss, and other software ecosystems are now on track to undergo rapid development.

  - The openEuler, openGauss, and MindSpore ecosystems have rallied more than 2,000 partners and over three million developers, with more than three million openEuler installations to date.

  - HarmonyOS had been deployed on 330 million Huawei devices. This growth has been supported by our collaboration with over two million developers and more than 2,300 HarmonyOS Connect partners within the HarmonyOS ecosystem.

Security and Trustworthiness

We remain dedicated to the research of technologies related to security and trustworthiness and work hard to improve engineering technologies and capabilities, such as software engineering and systems engineering in the R&D domain, so as to build secure, resilient, reliable, and quality products for customers.

- We have built an end-to-end IPD-SFP cyber security engineering system which covers R&D, procurement, and delivery and services. By institutionalizing best practices and incorporating them into business processes and IT operating platforms, we are developing advanced cyber security capabilities.

- We have created a digital system design methodology that is centered on full digital design assets and allows massive numbers of documents to be passed on or transferred. With this method, empirical assets in large-scale, complicated systems can now be reused more efficiently, increasing the agility of design and verification.

- Huawei is an active member of and major contributor to open source communities like Rust and standards organizations such as ISO, ITU-T, 3GPP, and IETF. Together, we are laying the cornerstone of trust in the digital world.

Exchange, Enlighten, Explore: Going Beyond Physical Boundaries to Ignite the Spirit of Inquiry and Academic Exchange

Scientific exploration is an undertaking that hinges on communication, sharing, cooperation, and patient investment. Scientific research is most powerful when driven by close engagement and collaboration between scientists and experts. Huawei remains open to collaboration and is always looking to join hands with outstanding researchers and partners from around the world to address the biggest challenges of our times.

- In 2022, Huawei officially launched the Chaspark Technology Website, which has attracted more than 120,000 authenticated users from across multiple academic fields. We intend to build Chaspark into a world-class, open platform for academic exchanges. To date, the platform has presented over 7,000 hot topic posts and research papers, more than 2,200 academic activities, and 285 technical challenges, allowing experts from outside Huawei to propose their own solutions.
- June 2022 saw the first issue of the quarterly journal *Communications of Huawei Research*, which documents and shares the latest findings of researchers, both inside and outside of Huawei, from across the various research domains in which the company is engaged. By December 31, 2022, we had published three issues, including 39 academic papers and research findings from over 170 Huawei scientists and external researchers.

Huawei has one of the world's largest patent portfolios

By the end of 2022, Huawei held a total of **120,000+** active patents.

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

In 2022, our total R&D spending was **CNY161.5 billion**, representing **25.1%** of total revenue.

Total R&D investment over the last decade now exceeds **CNY977.3 billion**.

At the end of 2022, **114,000+** employees, or **55.4%** of our workforce, worked in R&D.

Huawei is an industry leader in patents in multiple mainstream standards fields, including mobile communications, short-distance communications, and video codecs. **Hundreds of companies** use our patented technologies through agreements or patent pools.

Huawei's patents are broadly recognized across the industry

In 2022, **29 companies** from China, the US, Europe, Japan, South Korea, and a number of other countries and regions entered into new licensing agreements with Huawei to pay for the use of the company's patented technologies.

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

Over the past year, we have continued working hard to succeed through quality and make Huawei synonymous with high quality in the ICT industry. In the pursuit of these goals, we have further strengthened our ISO 9000-based total quality management system, which has involved implementing strategy-driven, all-hands, and full-process quality management across our entire value chain while aligning with customer needs. Furthermore, we have extended our quality management mechanisms and requirements to every part of our value chain. By investing even more heavily in quality management, we guarantee quality improvements for both ourselves and our suppliers, and thus deliver high quality to our customers.

- We are continuing to increase the quality awareness and capabilities of **all employees** and create an atmosphere and culture that value high quality:
  - We make department and team heads responsible for quality to strengthen quality objective management and provide more quality-related incentives. We also regularly organize quality conferences, quality audits, and quality training, and present quality awards, to encourage all employees to pursue high quality.
  - We make the most of advanced quality engineering methods, such as the Huawei hardware innovation and optimization approach (HINA), the theory of inventive problem solving (TRIZ), and failure mode and effects analysis (FMEA), to drive the continuous improvement of our products and services. We have also doubled down on efforts to improve knowledge management and project retrospection. These professional approaches will help the company succeed through quality.
- We continue to manage quality and embed quality requirements into **all of our processes**:
  - Through our complete, three-level process architecture, which covers operational, enablement, and supporting processes, we have embedded varying requirements into all areas of our business, including R&D, supply, delivery and services, sales, and marketing.

One-piece flow: Automated, lean production line of on-board chargers (OBCs) and powertrains for intelligent electric power
Huawei has built a comprehensive quality management system and a complete production system for automotive grade manufacturing. These systems have both passed IATF 16949, VDA 6.3, TISAX, and ISO 26262, in addition to other third-party and customer certifications.

These requirements include those related to quality; compliance; trustworthiness; internal controls; cyber security and privacy protection; information security; business continuity; Environment, Health, and Safety (EHS); and Corporate Sustainable Development (CSD). Setting such requirements helps streamline all of the corresponding processes from end to end.

- We have also built a quality system for the company's diversified business portfolio, extracted maximum value from our quality data platform, and remained a trusted choice of customers thanks to high-quality products and services.

- With a focus on value and experience, we continue to encourage efforts to extend quality management to **every link of our value chain**:
  - We actively work to capture voices and feedback from customers and partners through numerous channels. Then, with corporate management deeply engaged in discussions and analyses surrounding key issues, we determine key areas for improvement, so as to improve customer satisfaction and achieve shared success with partners.
  - We continue to push quality management up the value chain. By passing our quality requirements on to the entire value chain, we help our suppliers and subcontractors hone their own edges in quality. These efforts are driving the advancement and coordinated development of the entire value chain.

All aspects of Huawei's ISO 9000-based total quality management have been certified by leading industry organizations, gaining extensive recognition from customers. Some of these aspects include financial robustness, quality management, risk management, delivery and services, supply chain management, knowledge management, project management, trustworthiness and software engineering, cyber security and privacy protection, information security, EHS, CSR, CSD, and business continuity management (BCM).

- 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 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/SAE 21434
  - A-SPICE
  - TISAX
  - NIST CSF

- Huawei has passed comprehensive audits, reviews, and assessments conducted by the world's top carriers, as well as by major enterprise and industry customers. The customers in question have also chosen Huawei as their strategic partner for future-oriented transformation. In 2022, Huawei received the Outstanding Achievement for Customer Centricity award from the European Foundation for Quality Management (EFQM). This marked the first time the prestigious global award had been awarded to a telecom vendor.

Improving the BCM System

In today's highly globalized and highly specialized world, Huawei's operations rely heavily on third parties. This makes BCM critical. Through years of sustained investment, Huawei has established a BCM system for domains such as R&D, procurement, manufacturing, logistics, and global technical services. This system covers our end-to-end processes, from suppliers to Huawei and on to our customers. As part of this system, we have developed and established effective measures to drive BCM and emergency response upskilling across organizations, allowing them to manage risks that arise during their daily

work. Specifically, we have built up management organizations, processes, and IT platforms, embedded key BCM elements into our product development and supply management, prepared business continuity plans and emergency management plans, and organized BCM training and drills for employees.

Key BCM Initiatives in R&D and Supply Chain

- Supply chain diversity: Huawei will always pursue globalized supply and supply chain diversity. When designing a product, we strive to source raw materials, boards, and products from more than one supplier, actively expand the pool of supply resources, and prioritize the supply diversity of raw materials. We prefer suppliers that have multiple manufacturing sites and avoid relying on any single supplier or region to safeguard supply availability.

- Scenario-specific stockpiles: During mass production, we identify and manage risks by preparing safety stocks of raw materials, semi-finished products, and finished products. This allows us to better address customer requirements and uncertainties from various sources, including supply availability, trade conflicts, and natural disasters like the pandemic.

- Supply and demand visibility: Huawei works closely with suppliers to ensure that demand forecasts, purchase orders, and supplier inventory are all visible through IT systems. This ensures that we receive timely demand information and have adequate supply.

Key BCM Initiatives in Manufacturing, Logistics, and Spare Parts Supply

- Manufacturing and supply resource backups: Huawei considers in-house manufacturing and outsourcing capabilities to be of equal importance. We have established long-term strategic partnerships with multiple electronics manufacturing service (EMS) suppliers. Board manufacturing and supply capabilities are shared between Huawei and EMS suppliers, and between multiple EMS suppliers, to ensure we always have a backup. We have also established supply centers in Shenzhen, Europe, Latin America, and Dubai, which serve as integrated equipment backups for each other.

- Logistics network resilience: We work with logistics partners to develop and verify independent and manageable logistics solutions, and use deterministic solutions to address uncertainties in supply chain security and availability, making global logistics networks more resilient.

- Spare part reserves to support full-lifecycle operations: Huawei reserves spare parts according to market demand and historical usage before a product reaches its end of life (EOL). After a product reaches its EOL, we reserve enough spare parts to cover the full lifecycle of all remaining products. This prevents any impact on the operational continuity of live customer networks.

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 the company's.

- 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 ensuring better 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 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.

Financial Compliance

As always, Huawei is dedicated to complying with applicable financial laws and regulations, and attaches great importance to the management of financial compliance risks. We continuously invest resources into financial compliance and have established a financial compliance management and control system that aligns with industry standard practices. We manage financial compliance from end to end by considering factors such as regions, transaction objects, fund routes, and the risk appetite of banks; setting key control points for our sales, procurement, supply, services, treasury, human resource, and other processes; and constantly working to improve our IT control tools. Huawei works hard to constantly increase its employees' compliance awareness and capabilities. Through the publicity of and training on financial compliance, the company has deepened managers' and employees' understanding of their own financial compliance obligations and responsibilities, as well as those of the company.

Anti-Bribery Compliance

Huawei has a zero-tolerance policy towards corruption and bribery. The company's anti-bribery compliance management is designed specifically for our diversified business portfolio, and we continuously develop the compliance management system and capabilities at both the group and subsidiary levels. Through this system, we constantly identify and monitor risks 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 manage our relationships with third parties to ensure compliance. 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 HR, 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

Huawei has appointed compliance board directors to every country and region where it operates. These directors manage and supervise the compliance of subsidiaries through the following key measures to guarantee the operational compliance of our businesses and the legal compliance of employees:

- Fully identifying and assessing risk under the ever-changing international business environment, and taking management measures to prevent or mitigate compliance risks
- Making compliance management tasks part of business organizations' KPIs, building a compliance management responsibility system, organizing compliance training, and creating an atmosphere that promotes integrity and compliance
- Guided by the tone at the top of our organization, formulating subsidiary compliance management policies and rules in accordance with applicable local laws and regulations; constantly internalizing external regulations; and arranging for country offices to formulate their own compliance white papers, specifying compliance requirements, guides, and prohibitive regulations for business activities and employee conduct

Management Transformations

The overall goal of transformation at Huawei is to "grow the harvest and increase soil fertility". Huawei constantly develops new business systems and digital platforms as a way to leverage digital technology to safeguard our business continuity and better address changes in internal and external environments, such as the company's diversified business portfolio.

- **Supporting business continuity through digitalization:**
  - With data becoming a core asset of production, the company has formulated an overall development strategy for handling data. This strategy is designed to ensure data security, respect data sovereignty, and manage data in the same way as modules, so that it can be easily integrated, split, and shared. Under this strategy, we enable enterprises to adopt data as a core competence, as this will help them achieve high-quality development.
  - Over the past year, we have reinforced the company's ability to scale up its unified data foundation, i.e., easy data splitting and integration. We have also improved the way we delegate authority over data slicing to ensure we can meet digital operations requirements at the group, business, and field office level.
  - We have developed controllable data exchange capabilities and a clearing mechanism that places data sovereignty at its core. This aims to guarantee controllable data sovereignty while bolstering business collaboration and

information sharing between ecosystem partners. By the end of 2022, the company had realized the controllable exchange of data within over 3,000 spreadsheets, striking a balance between protecting and sharing data. In addition, we have employed professional methodologies and management systems to reshape the data circulation model, helping companies maximize the value of their data.

- **Iterating digitalization to better serve customers and partners:**
  - In the carrier business, we have continuously expanded and deepened IT system integration for customer transactions. In 2022, we connected our transaction system with 31 new accounts, from end to end, and increased the number of accounts capable of conducting collaborative online transactions with us by 62.
  - In the enterprise business, we have opened up our Three Cloud platform and a unified partner enablement training and delivery platform to partners, and launched E+ apps to support partner upskilling.
  - In the consumer business, we have continued honing our skills to sell and deliver smart home solutions at scale, and working to optimize the platform for the integrated management of retail stores, omni-channel and multi-category sales, and systematic services, so as to create a comprehensive value stream for intelligent hardware and partner ecosystems.
  - In the Intelligent Automotive Solution (IAS) business, we are continuing our digitalization efforts to drive ongoing improvement in terms of both customer experience and satisfaction, and secure leadership in terms of both quality and security.
  - In the digital power business, we are committed to a multi-path approach while building ecosystems so that our DriveONE supply system offers the best possible quality and security at low costs, and is capable of supporting the tens of millions of digital power products in use today. We are also currently designing a quality management system centered on high-voltage, ultra-high-voltage, and energy storage equipment in a bid to make our digital power business synonymous with high quality in the energy sector.
  - Guided by the company's All-Online, All-Service, and Data-Driven principles, Huawei Cloud Computing has crafted its GrowCloud and GoCloud partner systems; developer platform, and OneData Assets Flywheel system, laying the foundation for secure, stable, and high-quality clouds.

- **In 2022, 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.**
  - **More competitive and trustworthy products:**
    - **Trustworthy results:** In 2022, 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 the Independent Cyber Security Lab (ICSL) within Huawei and obtained 279 external certifications. The company has maintained its record of zero major security incidents across these products.
    - **Trustworthy process:** We have realized integrity protection (preventing tampering, implantation, spoofing, and malicious code) and traceability for software sources, the development process, and the supply chain process.
      - > This includes integrity protection for 100% of deliverables to outside parties, and 100% binary consistency for applicable products.
      - > Furthermore, all requirements can now be traced from end to end, and online issues arising from either carrier or enterprise scenarios can also be traced back to the problematic lines of code, with all backtracking data being visible.
      - > Clean code: We have also constructed new architectures and platforms for over 80 products, and refactored 92% of historical Huawei-developed code.

- **Helping customers mitigate live-network risks through end-to-end transformation:**
  - Once a high-risk vulnerability is detected, the affected products and customers can be identified within minutes, while technical investigations into vulnerabilities at the product level can be finished within hours. Following this, workarounds can be provided within just three days, and patches can be provided within 30 days. These improvements help customers quickly mitigate any risks on their live networks.
  - We have also honed our skills in terms of product certificate O&M, helping customers mitigate risks stemming from information leaks related to their live-network certificates and certificate expiration.
  - Supported by improved product security configuration capabilities, we provide professional security configuration services to help customers mitigate live-network configuration risks.
  - We work to align contract and product lifecycles, and ensure that both these lifecycles meet industry requirements, so as to help customers mitigate risks arising from legacy equipment that remains on their live networks.
- **Promoting sustainability through management systems with built-in trustworthiness:** We have released the *Trustworthiness Capability Maturity Assessment Standards V3.0* and built trustworthiness into our Integrated Product Development (IPD), Lead to Cash (LTC), Channel Sales, Service Delivery, Supply, and Procurement processes. Critical R&D operations are now running on only 50 target systems, guaranteeing the lasting effects of transformation.
- **Creating a culture that values both trustworthiness and software:**
  - Every one of our software employees and managers must now be certified in software trustworthiness before being appointed to their positions.
  - All committers must obtain their respective professional certifications.
  - We have rolled out a white-box performance appraisal system across the company, and a culture that values both trustworthiness and software is taking shape.

- **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 also 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 multi-business organizations and mechanisms. In addition, we have rolled out transformations related to organizations and talent to improve our organizational capabilities and efficiency. In the face of ongoing challenges, our employees have stayed confident and our organization has remained dynamic.

In 2022, our initiatives for boosting organizational vitality focused on the following key areas:

- **Adapting organizational formations to our business, increasing organizational agility and efficiency, and steadily advancing transformation:**
  - The company has continued refining its organizational formations to better support a multi-business landscape that integrates ICT infrastructure, consumer, digital power, cloud, IAS, and chip businesses.
  - In 2022, we continued to roll out the Representative Office Full Autonomy Program globally, as scheduled, and piloted integrated business transformation at select representative offices, aiming to strengthen our representative offices and simplify HQ teams. These efforts are aimed at transforming our organization into one with multiple elite teams supported by a large platform.
  - We continued to develop new operations 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 went beyond organizational boundaries to synchronize R&D efforts. By pooling expert resources from numerous global industries and directing them towards the same goal, we are able to make breakthroughs in terms of key business and technical issues.
- **Selecting and developing managers with proven track records, and forging a management team with keen insights and solid expertise:**
  - We unified the thoughts of and requirements for managers across the company, boosted manager confidence, and remained dedicated to improving the expertise and leadership skills of managers at all levels.
  - We optimized our leadership management system, reinforced the term of office system and experience requirements for managers, stepped up efforts to build stronger managerial pipelines, and worked hard to build a more dynamic leadership team.
  - We clarified position requirements and set new development paths for managers, continued to select and develop managers that possessed successful experience, and proactively identified outstanding high-potential talent from key projects. We offer such talent more opportunities and bold deployments to key positions to encourage them, and others like them, to shine in greater numbers.
- **Continuing to actively source outstanding talent who best fit our positions from around the world, unleash the potential of current employees, and maintain the dynamics of teams across the company:**
  - We have continued bringing in talent from around the world, regardless of background or seniority. Top minds and scientists have joined us in droves and are helping us overcome the challenges we face today.
  - We have adopted a talent supply strategy that is tailored to our organizations and are working to create a diverse talent mix. We have 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 2022, as a way to create a stable specialist team. We also redoubled efforts to create a stronger locally-hired workforce through well-paced upskilling, enabling employees 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 optimizing the work of profession committees and capability development committees and maximizing the value of experts.

  The combination of these efforts aims to boost team effectiveness.
- **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 developing 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 diversified 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

Challenges and Opportunities

As the world grows more interconnected, digital, and intelligent, cyberspace is becoming an integral part of life, business, and the economy. While digital technologies like cloud computing, big data, artificial intelligence (AI), and 5G are creating unprecedented new value for society, the world is also growing increasingly vulnerable. As digital assets increase, attack surfaces are continuing to expand, security vulnerabilities are being exploited more frequently, and cyberspace as a whole is becoming increasingly unsecure. These are making cyber security assurance more important than ever.

We must continuously improve cyber security to safeguard the development of our digital economy, which entails both challenges and opportunities. That means building digital trust and making critical infrastructure both more secure and more resilient. That means guiding enterprises through the digital transformation process, implementing management and technical measures to control risks, ensuring compliance, and protecting both networks and data. Overall cyber security and privacy protection is about dealing with the daily details of good practice. It is not always exciting, but it does keep the world moving forward in a positive way.

Over the past 30-plus years, we have worked with carriers to build over 1,500 networks and have helped 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 picks 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, we have continued to make cyber security and privacy protection a top priority. We are committed to confronting cyber security and privacy challenges and seizing related opportunities through management transformation, technological innovation, and open collaboration. We are committed to fostering a better life for all in the future digital world where personal data is lawfully used and always protected by offering secure and trustworthy products, solutions, and services.

Continuously Consolidating Cyber Security and Privacy Protection Management, Building Secure and Trustworthy Products, Solutions, and Services, and Helping Customers Mitigate Risks

Internally, we are continuously optimizing our end-to-end cyber security and privacy protection assurance system and embedding related requirements into our business processes. This ensures that all cyber security and privacy

protection requirements are consolidated and up-to-date in each of our business domains. Externally, we work hard to combat cyberattacks for our customers, to help them mitigate risks and improve their cyber resilience. These efforts include:

- **Specifying governance principles and the general policy framework**
  We have developed cyber security governance principles and a general policy, referencing applicable laws, regulations, and industry standards, as well as Huawei's years of experience. They are intended to guide the development of cyber security organizations and capabilities within our various business domains so we can ensure that risks are effectively managed and that our products, solutions, services, and operations comply with relevant laws and regulations while remaining competitive in terms of security.

- **Deepening trustworthiness transformation and helping customers mitigate security risks on live networks**
  In 2022, we analyzed security risks, designed solutions, and aligned with customers in typical scenarios like lifecycle management, vulnerability management, digital certificate management, integrity protection, and security configuration. We also continued to keep customers apprised of potential risks, including those related to end of service and support, certificate expiration on live networks, and high-risk vulnerabilities, such as Log4j2, in order to help them manage these risks. We consistently monitored vulnerability information, quickly and accurately traced affected versions based on full software information, and took remedial measures to help affected customers mitigate risks and improve cyber resilience.

- **Consolidating privacy governance to respect and protect user privacy**
  We have continued to refine our global privacy compliance framework and guide business units through privacy compliance work by incorporating privacy protection requirements into everything we do, including R&D, services, and operations. We have also continued to invest in privacy compliance IT tools and platforms that improve the efficacy and maturity of compliance management in complex scenarios such as cross-border personal data transfers.

  In 2022, we released the *Huawei Privacy Governance White Paper* and shared Huawei's privacy governance methods and practices with the industry. We have also endeavored to protect the rights of data subjects by handling more than 25,000 requests in a timely and effective manner. Moreover, we have passed over 50 industry-recognized certifications and audits across different countries and business domains, ensuring that our corporate privacy protection policies are well enforced.

- **Helping customers manage risks through technological innovation**
  We continue to build intrinsic security capabilities in product design. Take 5G base stations, for example. Based on the mobile communications service model, we constantly perform security detection and identity assessment to ensure a quick response. We deploy functions such as minimum system and continuous security assessment to equip network elements with more effective protection capabilities, helping customers build secure and resilient mobile networks. In addition, we have introduced technologies such as security configuration checks, targeted vulnerability blocking, collaborative anti-ransomware, and high-performance multi-party computing to ICT products to enhance security and resilience.

  To address customers' pain points in security operations, we launched the next-generation cloud security operations platform "Cloud Security Brain". The platform's unified cloud security architecture allows our customers to greatly improve the efficiency of security operations by quickly managing security events throughout the lifecycle, including alarm discovery, collaborative handling, and event backtracking.

  For the HarmonyOS 3 operating system that powers devices, we have upgraded the Privacy Center and Security Center to make the security status of phones visible to users and help users manage their privacy more effectively. Furthermore, we have introduced an application control center to control risky applications appropriately. We provide an enhanced protection function to create a cleaner and more secure environment for the elderly and children. This effectively prevents malicious intrusions and better protects personal privacy and data security.

- **Continuously enhancing secure and trustworthy delivery and service operations**
  Over the past year, we have continued to enhance our rules, processes, and IT capabilities regarding trustworthy operations to ensure transparent and traceable network operations. As part of our commitment to developing the security

ecosystem, we organized cyber security training and certification for our partners and contractors to continuously improve their cyber security awareness and capabilities. Moreover, we actively communicated with industry stakeholders to jointly build cyber security capabilities in response to mounting cyber security challenges.

In addition, we have continued to optimize the presence of our global service centers to ensure more flexible service delivery. Meanwhile, we organized the Network Safety Day campaign with customers to identify and mitigate risks on live networks, strengthen cyber security awareness, enhance cyber resilience, and support secure and stable network operations.

- **Strengthening cyber security risk management and capability building within our supply chain**
  In 2022, we assessed and managed the cyber security risks of more than 4,000 suppliers worldwide, signed data processing or protection agreements with more than 5,000 suppliers, and managed cross-border data transfers of suppliers to ensure security and privacy compliance. We have stepped up efforts to equip our core suppliers with the skills they need in security design specifications and vulnerability management. We have continued to enhance our end-to-end security system, including incoming material checks, processing, manufacturing, and product delivery, optimize our supply chain tracing system, and establish linkages with hundreds of billions of data records. By doing so, we are able to track software and hardware within hours throughout the entire chain from incoming materials to customers, effectively supporting rapid issue rectification and risk mitigation.

- **Steadily boosting awareness and professional capabilities among all employees**
  In 2022, we held our Cyber Security and Privacy Protection Awareness Month campaign, which featured guidance from top-level management, expert lectures, knowledge quizzes, and a technology conference that attracted extensive employee participation. We continued to encourage employees to pursue external professional certification programs and, to date, more than 2,000 employees have obtained industry-recognized certifications such as Certified Information Systems Security Professional (CISSP), Certificate of Cloud Security Knowledge (CCSK), and Certified Information Privacy Manager (CIPM). We have also planned and developed new cyber security enablement courses and exams. So far, we have launched over 140 Massive Open Online Courses (MOOCs), which have already had more than 200,000 enrollments.

- **Increasing investment in independent third-party verification**
  We continued our cooperation with industry-recognized certification bodies to test the cyber security capabilities of Huawei products against international standards and best practices, providing customers with internationally recognized security assurance. In 2022, we obtained more than 30 internationally recognized cyber security certificates, a testament to the proven security of Huawei products:

  - World's first GSMA Network Equipment Security Assurance Scheme (NESAS) 2.2 audit: 5G base stations
  - Common Criteria (CC) EAL4+: 5G core network product Unified Distributed Gateway (UDG), Reliable Telecomm Operating System (RTOS), GaussDB Kernel, and CE series switches
  - ISO 19790 certification from the British Standards Institution (BSI): iTrustee and HSSD, the core modules of HarmonyOS
  - ISO 27034: ICT product R&D process

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

Cyber security and privacy protection are a common challenge, one that all stakeholders – including governments, industry and standards organizations, enterprises, technology suppliers, and consumers – have a shared responsibility to confront. Adhering to our cyber security values of integrity, trustworthiness, capability, accountability, openness, and transparency, we welcome more communication and collaboration with key stakeholders to jointly improve cyber security capabilities and address cyber security and privacy challenges. Together, we can promote standards development, conduct joint innovation, and share knowledge and best practices. We always strive to improve cyber security and protect personal privacy so that everyone can enjoy the benefits of technological advances.

In 2022, we made the following key achievements in external collaboration:

- In terms of standards, we contributed nearly 300 cyber security proposals to the international standards organizations 3GPP and GSMA, maintaining our longstanding position as a leader in the industry. We also submitted proposals on general security technical requirements on optical networks and equipment, router security requirements, AI model protection, critical information infrastructure protection, and confidential computing for server security to standards organizations like ETSI, IETF, ITU-T, China Communications Standards Association (CCSA), and the National Information Security Standardisation Technical Committee of China (TC260). These are just a few examples of our many ongoing contributions to the development of industry security standards.

- We deepened joint innovation with China Mobile on 5G application security. We continued our collaboration with China Mobile Zhejiang to foster new 5G network security solutions, such as security configuration checks for 5G equipment and intrusion detection for core network elements, based on the 5G Application Security Innovation Promotion Center (Zhejiang) of China's Ministry of Industry and Information Technology. These solutions effectively meet customer requirements for configuration management and security hardening in network deployment and help mitigate risks on live networks.

  In addition, we engaged in more extensive joint innovation with carriers in Chinese provinces that are at the forefront of 5G application, such as Guangdong and Jiangsu. Together, we continued to develop and enhance 5G network security capabilities, including device access control, network transmission encryption, slice isolation, and cyber security situation awareness, enriching the supply of security capabilities and satisfying the security requirements of sectors including manufacturing, energy, government, and connected vehicles. Notably, the all-round defense system for "vehicle, road, network, cloud, and data", jointly designed by Huawei and China Mobile Jiangsu for China's 5G-powered smart transportation infrastructure project, won first prize in the national final of the 5th Blossom Cup 5G Application Contest.

- At the Information Security Forum (ISF) World Congress, we supported China Telecom and Omantel in sharing the achievements of the GSMA 5G Cybersecurity Knowledge Base. Carriers can reference the knowledge base to mitigate security risks on live networks and improve cyber security and resilience. We built the security capabilities of network equipment and supported carriers in implementing the knowledge base.

- In 2022, we actively worked with governments worldwide to contribute to local talent cultivation and ecosystem development.

  - In Singapore, we partnered with the Cyber Security Agency and actively participated in its SG Cyber Safe Partnership Programme to further boost the cyber security capabilities and awareness of local businesses and organizations. In 2022, we also obtained the Data Protection Trustmark certification from the Infocomm Media Development Authority in recognition of our privacy protection efforts.

  - In Indonesia, we collaborated with multiple government ministries, including the National Cyber and Crypto Agency (BSSN), to cultivate cyber security talent and improve cyber security awareness through training, workshops, and other activities. In 2022, Huawei won the BSSN's Talent Development Contribution Award.

  - In Tunisia, we ramped up cooperation with the National Agency for Computer Security, and made active contributions to knowledge sharing, talent cultivation, and ecosystem development. In 2022, Huawei won the ICT Industry and Talent Development Award issued by the Prime Minister of Tunisia.

  - In Ghana, we continued our partnership with the Ministry of Communication and Digitalisation, National Cyber Security Agency, and Ministry of Education to help local students and civil servants improve their cyber security skills through training, promote their career development, and encourage more women to enter the field of cyber security.

- We intensified cooperation with regional and industry organizations to help improve cyber security capabilities and awareness in different regions.

  - 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, aiming to help member states systematically understand and respond to 5G cyber security threats, and more securely deploy and operate 5G networks and services.

In Thailand, we worked with the National Cyber Security Agency (NCSA) on activities like Thailand Cyber Security Week and various cyber security competitions that help identify local talent and improve cyber security awareness. We also delivered in-depth training on cyber security technologies and standards for a wide array of local organizations and talent through e-lab, a dedicated online learning platform. As a result, Huawei was awarded the Thailand Cybersecurity Excellence Award by Thai Prime Minister H.E. General Prayut Chan-o-cha.

In the UAE, we deepened our cooperation with the Cyber Security Council (CSC), actively contributed to the construction of the local cyber security ecosystem, and co-built a cyber security think tank and center of excellence for knowledge sharing and talent cultivation, helping enhance cyber security capabilities and awareness within the region. Huawei received the Fortress Cyber Security Award from the CSC.

- We worked with the Global Digital Foundation on hosting the AI Foundation Forum, bringing together experts in policy, standards, AI, and cyber security from across Europe to discuss AI and data governance.
- Together with the European Institute of Innovation & Technology and the Global Digital Foundation, we released the *Q&A Guide for Promoting Cybersecurity for SMEs in Europe*, providing cyber security suggestions for SMEs.

Cyber security and privacy protection are a shared responsibility, and all stakeholders need to tackle this global challenge together. We are committed to strengthening communication and collaboration with all stakeholders and promoting common security standards, technological innovation, security governance, testing, and verification. We look forward to ongoing collaboration with all stakeholders to build cyber security and privacy protection capabilities, share value, and embrace both challenges and opportunities to foster a better life for all in the future digital world.

Openness. Collaboration. Shared Success.

Over the past few years, we have seen two clear shifts in global industry.

First, many governments around the world are more actively building up domestic industry, taking a more proactive role in the development of industry standards, specifications, and industry roadmaps. In some regions and domains, these efforts are tied to broader de-globalization trends.

Second, there have been a number of research breakthroughs in – and broader application of – advanced technologies like broadband, wireless and optical communications, data centers, artificial intelligence (AI), cross-cloud computing, and graph computation. The scope of ICT services has expanded from human-to-human connections to human-to-machine and machine-to-machine connections, laying the foundations for more diverse application scenarios and brand-new user experiences. All of this has served to greatly accelerate the digital and intelligent transformation of industries.

Huawei is actively working with industry and ecosystem partners worldwide, promoting joint innovation between governments, businesses, academia, research institutes, and users to create practical value based on the needs of different industries. We work closely with different countries and industries, and promote cross-domain and cross-technology collaboration in various forms, in order to tackle real-world problems that different industries

face. Together with our partners, we are cultivating an ecosystem that is conducive to healthy and coordinated cross-sector development, driving the digital economy forward, accelerating digital transformation, and helping to speed up the arrival of an intelligent world. The following are the types of industries we work with and the efforts we aim to promote.

- **Standards-centric industries,** including industries like mobile networks, fixed networks, core networks, digital power, and other infrastructure-related domains. For industries like these, we need to drive industry consensus and promote unified global standards and interconnectivity.
- **Ecosystem-centric industries**, including those like cloud services, computing, vehicle-mounted computing, and device operating systems. For these industries, based on a core set of products and platforms, we need to expand the pool of potential partners and developers through open collaboration (e.g., open source initiatives), and continuously optimize application enablement, talent development, and value distribution.
- **Hybrid industries** are those that rely on both standards and ecosystems, such as digital devices. For industries like this, we need to both promote common standards and develop broader ecosystems.

Key Progress and Industry Contributions

As of the end of 2022, Huawei is an active member of approximately 800 standards organizations, industry alliances, open source communities, and academic associations. We hold more than 450 key positions within these organizations. We continue to strengthen strategic collaboration with 3GPP, 5G-ACIA, AII, Apache, CCSA, IIC, ETSI, ECC, the Linux Foundation, the Eclipse Foundation, the OpenAtom Foundation, TM Forum, NetworldEurope, the National Technical Committee of Auto Standardization, and AUTOSAR. We have also worked to promote more in-depth collaboration and mutual recognition of standards between Chinese and European industry organizations.

We have established industry collaboration platforms together with industry organizations, think tanks, academia, and enterprises from around the world. Through these platforms, we jointly explore central topics related to AI, intelligent driving, digitalization, and audio and video, analyzing industry breakpoints and challenges in order to drive consensus and create cross-sector synergy.

We also continue to cultivate talent essential for digital transformation, enable developers, and work with ecosystem partners to create shared success and social value in domains like Kunpeng, Ascend, Huawei Cloud, HarmonyOS, and intelligent automotive solutions.

Over the past five years, Huawei has worked with more than 30 leading industry organizations in different domains via the Global Industry Organizations (GIO) Roundtable, aligned around the vision of "Collaborating for Digital Economy Growth, Building a Better Intelligent World." Through the GIO platform, we continue to explore core issues relevant to industry digitalization and foster industry consensus. The *GIO White Paper on Industry-Specific Ecosystems* was updated and released in 2022, which first proposed an ecosystem modeling framework for digital platforms at different stages. This white paper also includes case studies on manufacturing and healthcare. In the future, more insights and case studies on industry-specific digital platforms will be included in this white paper. The pictures above are group photos taken at the 11th GIO Roundtable. This roundtable was held simultaneously in Barcelona (on the left) and Beijing (on the right), bringing together CXOs from 27 different industry organizations.

Standards Organizations

We continue to contribute to standards organizations, work with customers and industry partners to drive industry upgrade, and help create an environment where standards are set through openness, collaboration, and innovation.

To date, we have submitted over 68,000 standards contributions to more than 200 standards organizations. Together with our customers and industry partners worldwide, we are helping to promote technological progress and drive the global industry forward.

We are working to help promote unified global standards in the communications industry.

- Within 3GPP, we are contributing to key technical standards for 5G-Advanced and working to promote a thriving 5.5G ecosystem with innovative 5.5G applications.
- Through ETSI, we are supporting efforts to improve F5G and F5.5G industry standards, drive a broader consensus on FTTR standards, and bring Fiber to Everywhere.
- Within the IETF, we are working with partners to research the standardization of application-aware networking and computing-aware networking, helping build a foundation for connectivity in a new era of computing.
- Within IEEE, we are helping drive the upgrade of standards for Wi-Fi 7, Ethernet, and other technologies to support the evolution of carrier, enterprise, and industrial networks.

We are promoting efforts to open up, co-develop, and share international standards.

- Within the ITU, we are exploring how to more effectively coordinate spectrum allocation and optimize spectrum utilization, and are contributing to network carbon intensity standards to pave the way for more sustainable development in the 5G industry.
- Within ISO/IEC JTC 1, we are helping to develop international standards for machine learning data quality in order to facilitate AI innovation and development.
- Within the IEC, we are working with vertical industry partners to build consensus and promote standards for zero carbon and renewable energy systems, and are facilitating efforts to set a shared industrial vision for 2035.

We are working to drive consensus on standards and enable industry development.

- We are exploring the application of 5G in verticals and working with industry experts to develop standards for their use in order to further advance digital transformation across all sectors.
- Together with partners, we are developing standards for photovoltaic systems, energy storage, charging networks, and more in the digital power domain, and helping improve standardization for green development.
- We are participating in the standards setting process for smart home, easy travel, entertainment, and other related domains, and helping upgrade user experience from multiple different angles.

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 industries go digital.

- **Promoting industry competitiveness and sustainable development:** We are working closely with industry organizations such as GCC, UWA, WAA, GIIC, SparkLink Alliance, DISA, NDIA, WBBA, and IMT-2030, as well as partners all along the value chain to promote industry-wide consensus. Our work includes standards development, testing and certification, and talent cultivation. These efforts will increase the industry-wide competitiveness of domains like diversified computing, video, WLAN, short-range communications, industrial software, fixed networks, and 6G, and promote sustainable industry development.

- **Strengthening industry collaboration to advance digital transformation:** Huawei is an active partner in industry organizations such as GSMA, CSIA, 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 like communications, manufacturing, electric power, iron and steel, coal mining, oil and gas, and ports. We are helping to advance the digital agenda of different industries.

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 dozens of international open source foundations, including the Apache Software Foundation, the Linux Foundation, the Eclipse Foundation, the OpenAtom Foundation, the OpenInfra Foundation, and the Cloud Native Computing Foundation (CNCF). Currently, we serve on dozens of different boards of open source communities and serve in hundreds of core roles, including those in Technical Steering Committees and Project Management Committees and roles like Project Team Lead, Maintainer, and Core Committer. In 2022, Huawei was the largest contributor to Linux Kernel 6.1 by changesets.

- **With a focus on foundational software, Huawei has launched multiple influential open source projects to build a stronger foundation for digital infrastructure ecosystems.** In recent years, Huawei has launched multiple platform-level open source projects, such as KubeEdge, MindSpore, Volcano, openEuler, openGauss, OpenHarmony, Karmada, Kurator, and openGemini, to support new trends like cloud native, automation, and intelligence. These foundational software projects have attracted the participation of an incredible number of vendors, developers, research institutes, and universities from all over the world. To date, hundreds of companies have joined these open source communities. We have donated openEuler and OpenHarmony to the OpenAtom Foundation, and donated KubeEdge, Volcano, and Karmada to CNCF. These projects have united the contributions of global participants through a more open approach, and are helping accelerate software innovation and create thriving industry ecosystems.

- **We are building a foundational software ecosystem with industry partners.**
  - Huawei has assigned more than 2,000 developers, contributed more than 30 core subsystems, and submitted over 10 million lines of core code to support the development of the OpenHarmony community. We actively work with open source contributors to further promote the development of OpenHarmony. By the end of 2022, OpenHarmony ranked No. 1 on the Gitee Index, with more than 5,000 code contributors and over 220 software and hardware products passing compatibility tests. OpenHarmony is now the most active open source project hosted on the Gitee platform in terms of both its code contributions and community activity.
  - The openEuler community has rallied more than 12,000 developers and over 770 enterprise members. Using openEuler community releases, community partners have launched nearly 20 commercial distributions, with over three million commercial deployments in total.

- **We are helping to build sustainable, thriving, and trusted open source communities.** We are working to build a diverse, inclusive, and trusted industry ecosystem through open source collaboration. Huawei actively joins forces with industry partners to improve open source security and address cyber security challenges. We have also launched the Open Source Rainforest program, through which we offer 11 open source courses to help enterprises enhance their open source capabilities.

Academic Associations

Huawei embraces an open and diverse academic culture. We have actively expanded and strengthened our collaboration with academic associations as part of our diversified, multi-path efforts to explore challenges that industries face and cultivate STEM talent. Together, we are invigorating academic pursuits while promoting social and economic progress.

- **Through a number of academic associations and platforms, we work closely with academia to convert real-world industry challenges into meaningful research topics. We also promote multilateral engagement and cooperation through academic conferences and funds.**
  - Together, we have identified future challenges for optical communications at international academic conferences on optics, attracting researchers from around the world to probe the frontiers of optical technology.
  - We continue to increase funding for the China Computer Federation (CCF)-Huawei Populus Grove Fund and have worked closely with academic partners to identify more than 50 new areas of academic inquiry to further research in computing.
  - We also continue to increase funding for the Chinese Association for Artificial Intelligence (CAAI)-Huawei MindSpore Open Fund and have supported the publication of more than 400 papers at top conferences in an effort to drive advancements in AI.
- **We actively contribute new ideas to academic associations.** We have published more than 630 journal and conference papers in high-impact channels like the ACM and IEEE. Nine of Huawei's experts serve as fellows in academic associations around the world.
- **We work with academic associations to cultivate STEM talent through competitions.** To inspire and engage the next generation of STEM talent, we contribute real-world industry challenges for multiple competitions hosted by academic organizations like IEEE and CAAI.

Ecosystems

Huawei works with ecosystem partners, developers, and universities to help industries go digital and build thriving ecosystems.

- **Developing platform capabilities to cultivate thriving ecosystems:** We focus on developing platform capabilities for our ecosystem-centric businesses like HarmonyOS, Kunpeng, Ascend, cloud computing, and intelligent automotive solutions. We also openly collaborate with a wide range of partners to develop business ecosystems that thrive on shared success. Together, we aim to unleash ecosystem-based innovation and create greater value for our customers while achieving shared success with ecosystem partners and developers.
- **Enabling ecosystem partners on all fronts, working together to drive shared success, and creating greater value for our customers:** We have launched multiple programs like the Huawei Cloud Partner Competency Program, the Kunpeng Partner Program, and the openEuler Partner Program to encourage innovation among partners. By the end of 2022, we have worked with more than 43,000 ecosystem partners, released over 10,000 products on KooGallery, and have certified more than 12,000 Kunpeng application software solutions, over 2,000 innovative Ascend solutions, and 50,000 feature abilities (FAs) for HarmonyOS. Together with our partners, we currently serve more than 20 core industries, including government, finance, energy, transportation, manufacturing, healthcare, and education.
- **Improving developer experience and supporting innovation:**
  - Huawei actively advocates for co-creation, sharing progress, and sharing success. We continue to expand access to more technologies, enrich toolchains, share industry

experience, and increase funding for developers. These efforts aim to improve developer experience and support them in hardware and software design, development, testing, release, and operations, ultimately paving the way for greater success. As of the end of 2022, we serve and support about nine million developers.

- In 2022, we invested CNY1.94 billion to support developer innovation through programs like the Huawei Cloud Developer Program, the OpenMind Program, and the Shining-Star Program. In the same year, we provided 3.65 million training opportunities to developers both online and offline, and issued Huawei technical certifications to 220,000 developers.

- **Developing a robust digital talent ecosystem, sharing ICT knowledge and skills, and helping universities cultivate digital talent:** Huawei has launched a variety of programs, including the Huawei Cloud Developer Program (for universities), the HarmonyOS 100 School Seeds Program, the Business-Academia Talent Development Program, and the Talent Development Acceleration Program. We also sponsor various programs like talent cultivation and competitions in colleges and universities. Over the past three years, these programs have benefited over 600,000 students and 6,000 teachers from 370 universities, and we will continue to expand these efforts moving forward.

Industrial Policies

We are working to promote sustainable development and create greater business and social value through digital inclusion and ubiquitous connectivity.

- **Supporting Digital First Economy to promote digital inclusion**

  This past year, Huawei and IDC proposed the concept of "Digital First Economy", calling on policymakers to introduce more favorable policies that support broadband, cloud, AI, data, and digital talent development. These are part of broader efforts to promote sustainable development and create greater social and business value through digital inclusion and ubiquitous connectivity.

  At the World Economic Forum, ITU, APEC Business Advisory Council, and other international organizations and forums, we regularly share our experience and best practices in promoting digital transformation, inclusive AI, digital inclusion, and more.

- **Advising on policy to advance digital transformation**

  We actively participate in public consultations on digital economy planning and industrial policy in all countries where we operate. These efforts include sharing recommendations on digital infrastructure development, digital skills programs, and incubating new business models. In every country, our goal is to promote inclusive and sustainable digital transformation.

Results of Operations

Financial Performance

(CNY Million)	2022	2021	YoY
Revenue	**642,338**	636,807	0.9%
Gross profit	**281,925**	307,442	(8.3)%
– Gross profit margin	**43.9%**	48.3%	(4.4)%
Total operating expenses	**(271,279)**	(246,827)	9.9%
– as % of revenue	**42.2%**	38.8%	3.4%
Other income, net	**31,570**	60,797	(48.1)%
Operating profit	**42,216**	121,412	(65.2)%
– as % of revenue	**6.6%**	19.1%	(12.5)%
Net finance income	**1,018**	493	106.5%
Income tax	**(8,384)**	(8,227)	1.9%
Net profit	**35,562**	113,718	(68.7)%

Huawei's total revenue in 2022 reached CNY642,338 million, representing a 0.9% YoY increase. Net profits amounted to CNY35,562 million.

- Our enterprise business maintained solid growth as industries are increasingly moving towards digital, green, and low-carbon development.
- The decline in our consumer business slowed.
- As we continued to invest in future-oriented basic research and open innovation, development of new business domains, ecosystem building, and digital transformation, our total operating expenses as a percentage of revenue increased by 3.4 percentage points YoY.

Total operating expenses

(CNY Million)	2022	2021	YoY
Research and development expenses	**161,494**	142,666	13.2%
– as % of revenue	**25.1%**	22.4%	2.7%
Selling and administrative expenses	**109,785**	104,161	5.4%
– as % of revenue	**17.1%**	16.4%	0.7%
Total operating expenses	**271,279**	246,827	9.9%
– as % of revenue	**42.2%**	38.8%	3.4%

We continued to invest in future-oriented basic research and open innovation in domains such as cloud, intelligent automotive components, and foundational software technologies. As a result, the company's R&D expenses as a percentage of revenue increased by 2.7 percentage points YoY.

We also continued to invest in the development of new business domains, ecosystem building, and digital transformation. As a result, our selling and administrative expenses as a percentage of revenue increased by 0.7 percentage points YoY.

Net finance income

(CNY Million)	2022	2021	YoY
Net foreign exchange loss	**(277)**	(358)	(22.6)%
Other net finance gains	**1,295**	851	52.2%
Total net finance income	**1,018**	493	106.5%

Huawei's net finance income in 2022 totaled CNY1,018 million, a YoY increase of CNY525 million. This growth was primarily attributable to an increase in other net finance gains.

Financial Position

(CNY Million)	December 31, 2022	December 31, 2021	YoY
Non-current assets	**289,008**	213,593	35.3%
Current assets	**774,796**	769,378	0.7%
Total assets	**1,063,804**	982,971	8.2%
Among which: Cash and short-term investments	**373,452**	416,334	(10.3)%
Trade receivables	**87,177**	72,242	20.7%
Contract assets	**52,527**	52,544	0.0%
Inventories and other contract costs	**163,282**	161,306	1.2%
Non-current liabilities	**196,870**	175,864	11.9%
Among which: Long-term borrowings	**183,183**	162,276	12.9%
Current liabilities	**429,858**	392,455	9.5%
Among which: Short-term borrowings	**13,961**	12,824	8.9%
Trade payables	**85,272**	81,694	4.4%
Contract liabilities	**87,575**	78,149	12.1%
Equity	**437,076**	414,652	5.4%
Total liabilities and equity	**1,063,804**	982,971	8.2%

As of December 31, 2022, Huawei's balance of total assets had reached CNY1,063,804 million, up 8.2% YoY. Current assets accounted for 72.8% of our total assets.

As of December 31, 2022, our total short-term and long-term borrowings increased by CNY22,044 million YoY. The primary purpose of these borrowings was to continue with our investment in future-oriented basic research and open innovation.

Cash Flow from Operating Activities

(CNY Million)	2022	2021	YoY
Net profit	**35,562**	113,718	(68.7)%
Adjustment for depreciation, amortization, impairment, net foreign exchange losses and non-operating income and expenses	**8,353**	(22,252)	(137.5)%
Cash flow before change in operating assets and liabilities	**43,915**	91,466	(52.0)%
Change in operating assets and liabilities	**(26,118)**	(31,796)	(17.9)%
Cash flow from operating activities	**17,797**	59,670	(70.2)%

In 2022, our cash flow from operating activities amounted to CNY17,797 million, a YoY decrease of 70.2%.

Financial Risk Management

In 2022, 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, 2022, our cash and short-term investments amounted to CNY373,452 million, which shows that we properly managed our liquidity risks.

(CNY Million)	2022	2021	YoY
Cash flow from operating activities	**17,797**	59,670	(70.2)%
Cash and short-term investments	**373,452**	416,334	(10.3)%
Short-term and long-term borrowings	**197,144**	175,100	12.6%

Foreign Exchange Risk

Our presentation currency is CNY, but we have foreign currency exposure 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 exposure 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 will impact our net profit as follows:

(CNY Million)	2022	2021
USD depreciates by 5%	**1,013**	899
EUR depreciates by 5%	**(106)**	159

Interest Rate Risk

Interest rate risks mainly arise from Huawei's long-term borrowings. By analyzing interest rate exposure, 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, 2022

	2022		2021	
	Effective Interest Rate(%)	**(CNY million)**	Effective Interest Rate(%)	(CNY million)
Fixed-rate long-term financial instruments: Long-term borrowings	**3.74**	**53,219**	3.94	39,250
Floating-rate long-term financial instruments: Long-term borrowings	**3.86**	**129,964**	3.27	123,026
Total		**183,183**		162,276

2. Sensitivity analysis

Assuming that the interest rate increased by 50 basis points on December 31, 2022 and other variables remained unchanged, the company's net profit and equity would decrease by CNY533 million (in 2021, the amount decreased by CNY503 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. To transfer risks, Huawei arranges for third-party financial institutions to provide sales financing, such as export credit facilities, leasing, and factoring. These institutions bear the associated risks and profit from these operations. 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 94 to 137, which comprises the summary consolidated statement of financial position as at December 31, 2022, 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, 2022.

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, 2022 in our report dated March 22, 2023.

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 22, 2023

Consolidated Financial Statements Summary

Summary Consolidated Statement of Profit or Loss and Other Comprehensive Income

(CNY million)	Note	2022	2021
Revenue	8	**642,338**	636,807
Cost of sales		**(360,413)**	(329,365)
Gross profit		**281,925**	307,442
Research and development expenses		**(161,494)**	(142,666)
Selling and administrative expenses		**(109,785)**	(104,161)
Other income, net	9	**31,570**	60,797
Operating profit		**42,216**	121,412
Finance income and expenses	11	**1,018**	493
Share of associates' and joint ventures' results (post tax)		**712**	40
Profit before tax		**43,946**	121,945
Income tax	12	**(8,384)**	(8,227)
Profit for the year		**35,562**	113,718
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		**65**	(341)
Equity investments at fair value through other comprehensive income (FVOCI) – net change in fair value		**(1,169)**	2,530
		(1,104)	2,189
Items that may be reclassified subsequently to profit or loss:			
Non-equity financial assets at FVOCI – net change in fair value and impairment loss		**(250)**	17
Translation differences on foreign operations		**3,514**	(6,183)
Share of other comprehensive income of associates and joint ventures		**(1)**	–
		3,263	(6,166)
Other comprehensive income		**2,159**	(3,977)
Total comprehensive income		**37,721**	109,741
Profit for the year attributable to:			
Equity holders of the Company		**35,534**	113,672
Non-controlling interests		**28**	46
Total comprehensive income attributable to:			
Equity holders of the Company		**37,694**	109,715
Non-controlling interests		**27**	26

The notes on pages 98 to 137 form part of this consolidated financial statements summary.

Summary Consolidated Statement of Financial Position

(CNY million)	Note	December 31, 2022	December 31, 2021
Assets			
Property, plant and equipment	14	**137,024**	124,134
Goodwill and intangible assets	15	**8,048**	8,104
Right-of-use assets	29	**23,286**	21,666
Interests in associates and joint ventures	16	**7,109**	4,342
Other investments and derivatives	17	**83,055**	30,194
Deferred tax assets	18	**11,760**	10,340
Contract assets	20	**1,025**	1,207
Trade and bills receivable	21	**3,073**	3,113
Other assets	22	**14,628**	10,493
Non-current assets		**289,008**	213,593
Inventories and other contract costs	19	**163,282**	161,306
Contract assets	20	**51,502**	51,337
Trade and bills receivable	21	**87,804**	76,234
Other assets	22	**98,451**	63,923
Other investments and derivatives	17	**226,488**	288,183
Cash and cash equivalents	23	**147,269**	128,395
Current assets		**774,796**	769,378
Total assets		**1,063,804**	982,971
Equity			
Equity attributable to equity holders of the Company		**436,975**	414,557
Non-controlling interests		**101**	95
Total equity		**437,076**	414,652
Liabilities			
Loans and borrowings	24	**183,183**	162,276
Deferred tax liabilities	18	**3,804**	4,282
Lease liabilities		**7,275**	6,552
Other liabilities	27	**2,608**	2,754
Non-current liabilities		**196,870**	175,864
Loans and borrowings	24	**13,961**	12,824
Employee benefits		**97,697**	99,927
Income tax payable		**4,217**	2,755
Trade and bills payable	25	**92,104**	81,694
Contract liabilities	26	**87,575**	78,149
Lease liabilities		**3,296**	2,952
Other liabilities	27	**114,426**	96,711
Provisions	28	**16,582**	17,443
Current liabilities		**429,858**	392,455
Total liabilities		**626,728**	568,319
Total equity and liabilities		**1,063,804**	982,971

The notes on pages 98 to 137 form part of this consolidated financial statements summary.

Summary Consolidated Statement of Cash Flows

(CNY million)	Note	2022	2021
Cash receipts from goods and services		**711,048**	708,883
Cash paid to suppliers and employees		**(746,228)**	(701,351)
Other operating cash flows		**52,977**	52,138
Net cash generated from operating activities		**17,797**	59,670
Net cash generated from/(used in) investing activities		**6,270**	(100,575)
Net cash (used in)/generated from financing activities		**(8,622)**	871
Cash and cash equivalents			
Net increase/(decrease)		**15,445**	(40,034)
At January 1		**128,395**	173,050
Effect of foreign exchange rate changes		**3,429**	(4,621)
At December 31	23	**147,269**	128,395

The notes on pages 98 to 137 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 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, 2022 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, 2022 in order to disclose material financial information relating to the Group's business operation.

3 Significant 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 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 difference between the fair value of the consideration paid and the fair value of identifiable net assets is recorded as goodwill. Where the fair value of the assets acquired less liabilities assumed exceeds the consideration paid, the excess is recognized immediately in profit or

loss as a gain. Transaction costs incurred in an acquisition are recognized in profit or loss.

(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).

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 which give rise to contractual cash flows which are solely principal and interest and which 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 which give rise to contractual cash flows which are solely principal and interest and are held in a business model which 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 qualify for 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 thereafter. 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. 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. Gains and losses representing hedge ineffectiveness are recognized in profit or loss.

(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) 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)) 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 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 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 due 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 remeasured 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 remeasured 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.

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. 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 for the year comprises current tax and movements in deferred tax assets and liabilities. Current tax and movements in deferred tax assets and liabilities are recognized in profit or loss except to the extent that they relate to items recognized in other comprehensive income or directly in equity, in which case the relevant amounts of tax are recognized in other comprehensive income or directly in equity, respectively.

Current tax is the expected tax payable on the taxable income for the year, using tax rates enacted or substantively enacted at the end of the reporting period, and any adjustment to tax payable in respect of previous years.

Deferred tax is recognized on temporary differences, representing the difference 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 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 that may support the recognition of deferred tax assets arising from deductible temporary differences include those that will arise from the reversal of existing taxable temporary differences, provided those differences relate to the same taxation authority and the same taxable entity, and are expected to reverse either in the same period as the expected reversal of the deductible temporary difference or in periods into which a tax loss arising from the deferred tax asset can be carried back or forward. The same criteria are adopted when determining whether existing taxable temporary differences support the recognition of deferred tax assets arising from unused tax losses and credits, that is, those differences are taken into account if they relate to the same taxation authority and the same taxable entity, and are expected to reverse in a period, or periods, in which the tax loss or credit can be utilized.

No deferred tax is recognized for temporary differences on:

- the initial recognition of goodwill;
- the initial recognition of assets or liabilities that affect neither accounting nor taxable profit (provided they are not part of a business combination); and
- investments in subsidiaries to the extent that, in the case of taxable differences, the Group controls the timing of the reversal and it is probable that the differences will not reverse in the foreseeable future, or in the case of deductible differences, unless it is probable that they will reverse in the future.

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 end of the reporting period. Deferred tax assets and liabilities are not discounted.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and is reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow the related tax benefit to be utilized. Any such reduction is reversed to the extent that it becomes probable that sufficient taxable profits will be available.

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, are significantly interdependent in nature or contain significant pricing dependencies.

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 has changed its business from three operating segments, Carrier Business, Enterprise Business and Consumer Business, into five operating segments, ICT Infrastructure Business, Consumer Business, Cloud Computing Business, Digital Power Business and Intelligent Automotive Solution Business. Changes to operating segments have not resulted in changes to the Group's revenue accounting policies. The principal business activities of each segment are described in note 7. The specific revenue accounting policies applied by the Group in relation to 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. At the same time, the Group judges whether the control is transferred based on the channels' inventory levels. 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, services and solutions, recognized as a single POB, 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 services, network integration, network optimization, and network planning, the Group divides the whole service into several delivery milestones to measure the performance progress according to the deliveries specified in the contract. 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. Similar to the sales to distribution

channels in other business groups, the Group judges whether the control is transferred based on the channels' inventory levels. 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 or during transfer 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. The Group sells these 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 car manufacturers with intelligent automotive components and accessories, 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. 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 attaching 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

(a) Accounting judgments

(i) Revenue recognition

Revenue is recognized when control of a good or service is transferred to a customer as disclosed in note 3(q). To determine the satisfaction of performance obligations the Group applies the following judgments:

- Where revenue is recognized over time, the Group primarily uses the output method to measure progress; however, in a few cases, the input method is adopted when the Group is unable to reasonably measure the outcome of a performance obligation. 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. Judgments applied when using the input method include determining if consumption of the resources relative to the total expected amount faithfully depicts the transfer of control of goods and/or services promised to the customer.

- 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.

- For sales to distribution channels, judgment is also applied in determining when the control of the goods is transferred to distributors. These judgments involve several external and internal factors including, but not limited to, market conditions, product life cycles, distributor sales, competitive conditions and the extent to which the Group has continuing managerial involvement over the goods after their delivery.

(ii) Contract modification

The Group applies judgments in determining whether a contract modification should be treated as a new contract or a prospective change to an existing contract, or accounted for through a cumulative catch-up adjustment to revenue, by considering the nature of the goods and services, and sales price data.

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.

(b) Sources of estimation uncertainty

Key sources of estimation uncertainty are as follows:

(i) Revenue recognition

To determine the transaction price and the amounts allocated to performance obligations the Group applies the following estimation:

- 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, taking into consideration historical, current and expected information (see note 3(q)(i)(iv)).

- The collectability of a consideration is estimated at contract inception, based on the Group's assessment on the customer's ability and intention to pay when due and is reassessed if there are significant changes in the facts and circumstances.

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.

(ii) 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 taking into account 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.

(iii) 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(c) or other changes in market condition. Management will reassess the estimations at the end of each reporting period.

(iv) 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.

(v) Income tax

The Group is subject to income taxes in various jurisdictions. Significant judgment is required in determining the Group's provision for income taxes. There are many 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.

(vi) 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. Any increase or decrease in the provision would affect profit or loss in future years.

(vii) 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. Judgment is required in making such estimates and the ultimate outcome may be different.

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 taking into account 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.

(viii) Deferred tax assets

Estimation uncertainty arises from the recognition of deferred tax assets in respect of unused tax losses and deductible temporary differences. As explained in note 3(o), all 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. 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.

(ix) 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 taking into account 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.

(x) 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.

(c) Financial impact of the Entity List event

On May 16, 2019 and August 19, 2019 (dates in note 4(c) 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. In preparing these financial statements, management has applied significant judgments to estimate the impacts arising from the Events and relevant impairments and provisions have been recognized appropriately. The Group continuously assesses these impacts and makes adjustment to relevant estimates based on the development of the Events.

5 Changes in accounting policies and accounting estimates

(a) Changes in accounting policies

A number of new standards, amendments to standards or interpretations are effective from January 1, 2022 but they do not have a material effect on the Group's consolidated financial statements.

(b) Changes in accounting estimates

Benefiting from the improvements in hardware and software technologies, the estimated useful lives of the Group's servers and network equipment, which are categorized as electronic equipment, are extended from three years to four years and from three years to five years respectively from January 1, 2022. This change in accounting estimates reduced the Group's depreciation expense by CNY4.8 billion for year ended December 31, 2022, based on the relevant assets held as at December 31, 2021 and acquired during the year ended December 31, 2022.

6 Possible impacts of amendments, new standards and interpretations issued but not yet effective for the year ended December 31, 2022

The International Accounting Standards Board 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 has changed the structure of its internal organization in a manner that causes the composition of its reportable segments to change. As a result, the Group now divides its business into the following five operating segments from January 1, 2022:

- **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 with end-to-end commercial network products, services, and solutions, including wireless networks, cloud core networks, fixed networks, services, and software, and provides government and enterprise customers in different sectors such as finance, energy, transportation,

and manufacturing with products and solutions including data centers, campuses, digital sites, WANs, and services.

- **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 cloud native, artificial intelligence, data intelligence, audio and video services, and collaborative office.

- **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 products and solutions covering smart PV, data center facilities, site power facilities, and DriveONE (including e-mobility products for new energy vehicles), to help the energy industry shift to low-carbon development.

- **Intelligent Automotive Solution Business**

  The intelligent automotive solution business focuses on providing new components for intelligent connected vehicles, and aims to help the automotive industry go electric, connected, and intelligent. It provides products and solutions including intelligent cockpits, intelligent communication connectivity, intelligent driving, intelligent vehicle cloud service, and intelligent electric power.

Segment revenue includes both sales to external customers and inter-segment sales.

Prior to January 1, 2022, the Group divided its businesses into three operating segments:

- **Carrier Business**

  The carrier business provides global telecom carriers with end-to-end commercial network products, services, and solutions, including wireless networks, cloud core networks, fixed networks, services, and software.

- **Enterprise Business**

  The enterprise business builds ICT infrastructure by using advanced technologies like artificial intelligence, cloud, big data, Internet of Things, video, and data communications to help industries (e.g. smart cities, finance, energy, transportation, manufacturing, and education) go digital. Its products and solutions include Huawei Cloud, intelligent IP networks, Intelligent OptiX Network, computing, data centers, data storage, and 5GtoB.

- **Consumer Business**

  The consumer business 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. Driven by the HarmonyOS ecosystem, these products and services are designed to support five key scenarios: smart office, fitness & health, smart home, easy travel, and entertainment.

There were no inter-segment sales under the previous segment reporting structure.

Comparative information for the new reportable segments is not available and the cost to develop it would be excessive, and so previously presented information has not been restated. Therefore, segment information is presented as follows:

(i) reportable segments for the year ended December 31, 2022, and

(ii) previously reportable segments for the years ended December 31, 2021 and 2022 for comparative purposes.

(a) Revenue information in respect of business segments

(i) Reportable segment revenue for the year ended December 31, 2022

(CNY million)	2022
ICT Infrastructure	**353,978**
Consumer	**214,463**
Cloud Computing	**45,342**
Digital Power	**50,806**
Intelligent Automotive Solution	**2,077**
Other items	**3,978**
Elimination	**(28,306)**
Total	**642,338**

(ii) Previously reportable segment revenue for the years ended December 31, 2021 and 2022 for comparative purposes

(CNY million)	2022	2021
Carrier	**283,978**	281,469
Enterprise	**133,151**	102,444
Consumer	**214,463**	243,431
Other items	**10,746**	9,463
Total	**642,338**	636,807

(b) Geographical revenue information

(CNY million)	2022	2021
China	**403,999**	413,299
Europe, the Middle East and Africa (EMEA)	**149,206**	131,467
Asia Pacific	**48,048**	53,675
Americas	**31,898**	29,225
Others	**9,187**	9,141
Total	**642,338**	636,807

8 Revenue

(CNY million)	2022	2021
Revenue from contracts with customers	**641,420**	636,080
Rental income	**918**	727
	642,338	636,807

Revenue from contracts with customers is analyzed by timing of revenue recognition as follows:

(CNY million)	2022	2021
Recognized at a point in time	**513,594**	520,682
Recognized over time	**127,826**	115,398
	641,420	636,080

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, 2022 from POBs satisfied (or partially satisfied) in previous years amounted to CNY2,612 million (2021: CNY1,351 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.

Transaction price allocated to remaining performance obligations

As at December 31, 2022, the aggregated amount of transaction price allocated to the remaining performance obligations under the Group's existing customer contracts is CNY83,535 million (2021: CNY82,387 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). 76% of the amount is expected to occur over the next year (2021: 74%), 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	2022	2021
Gain on disposal of subsidiaries and businesses		**59**	57,431
Fair value changes in financial instruments arising from disposals of subsidiaries and businesses	34	**24,524**	–
Government grants	(i)	**6,552**	2,571
Commissions on individual income tax payments withheld		**640**	573
(Impairment)/reversal of impairment of property, plant and equipment, intangible assets, goodwill and right-of-use assets		**(229)**	72
Factoring expenses		**(1,147)**	(672)
Donations		**(187)**	(231)
Net loss on disposal of property, plant and equipment, intangible assets and right-of-use assets		**(80)**	(112)
Others, net		**1,438**	1,165
		31,570	60,797

(i) During the year ended December 31, 2022, government grants recognized as other income, net included unconditional grants of CNY976 million (2021: CNY844 million), and conditional grants of CNY5,576 million (2021: CNY1,727 million) which are generally related to research and development projects.

10 Personnel expenses

(CNY million)	2022	2021
Salaries, bonuses and allowances	**153,022**	143,684
Defined benefit plans	**6,137**	5,240
Defined contribution plans and others	**17,772**	15,614
	176,931	164,538

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	2022	2021
Interest income on financial assets at amortized cost			
– deposits and wealth management products		**3,085**	1,699
– other financial assets		**413**	669
Interest income on financial assets at FVOCI		**185**	122
Net gains on financial instruments mandatorily at FVPL	(i)	**5,548**	4,695
Gains on derecognition of debt securities at FVOCI reclassified from OCI	13(b)	**–**	4
Interest income on lease receivables		**21**	28
Dividend income and others		**807**	948
Finance income		**10,059**	8,165
Interest expense on loans and borrowings		**(7,596)**	(6,117)
Less: interest expense capitalized	(ii)	**124**	55
Interest cost on employee benefit obligations		**(638)**	(684)
Interest expense on lease liabilities	29(a)(ii)	**(417)**	(381)
Other interest expense		**(202)**	(166)
Net foreign exchange loss	(iii)	**(277)**	(358)
Reversal of impairment/(impairment loss)		**4**	(4)
Bank charges		**(39)**	(17)
Finance expenses		**(9,041)**	(7,672)
Net finance income		**1,018**	493

(i) The net gains 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, 2022, net foreign exchange loss includes a net fair value loss of CNY557 million on foreign exchange derivatives that are not designated as hedging instruments (2021: net fair value gains of CNY331 million).

12 Income tax in the summary consolidated statement of profit or loss and other comprehensive income

Charge for the year

(CNY million)	2022	2021
Current tax		
Provision for the year	**9,487**	6,592
Under/(over) provision in respect of prior years	**142**	(108)
	9,629	6,484
Deferred tax	**(1,245)**	1,743
	8,384	8,227

13 Other comprehensive income

(a) Tax effects relating to each component of other comprehensive income

(CNY million)	2022			2021		
	Before-tax amount	**Tax benefit**	**Net-of-tax amount**	Before-tax amount	Tax benefit	Net-of-tax amount
Re-measurement of defined benefit obligations						
– The Group	**71**	**(6)**	**65**	(350)	9	(341)
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	**(1,521)**	**352**	**(1,169)**	3,366	(836)	2,530
Net change in the fair value and impairment loss of non-equity financial assets						
– The Group	**(266)**	**16**	**(250)**	21	(4)	17
	(1,787)	**368**	**(1,419)**	3,387	(840)	2,547
Translation differences on foreign operations						
– The Group	**3,500**	**14**	**3,514**	(6,183)	–	(6,183)
– Share of associates and joint ventures	**(1)**	**–**	**(1)**	–	–	–
	3,499	**14**	**3,513**	(6,183)	–	(6,183)
	1,783	**376**	**2,159**	(3,146)	(831)	(3,977)

(b) Components of other comprehensive income, including reclassification adjustments

(CNY million)	**2022**	2021
Net change in the fair value and impairment loss of financial assets measured at FVOCI:		
Changes in fair value recognized during the year	**(1,791)**	3,397
Reclassification adjustments for amounts transferred to profit or loss:		
– Gain on derecognition (note 11)	**–**	(4)
Loss allowances recognized/(reversals)	**4**	(6)
Net deferred tax credited/(debited) to other comprehensive income	**368**	(840)
Net movement in the fair value reserve during the year	**(1,419)**	2,547
Translation differences on foreign operations:		
Recognized during the year:		
– Translation differences	**3,592**	(6,214)
– Effective portion of changes in fair value of hedging instruments	**(93)**	–
Reclassification adjustments for amounts transferred to profit or loss:		
– Disposal of subsidiaries	**–**	31
Net deferred tax credited to other comprehensive income	**14**	–
Net movement in the translation reserve during the year	**3,513**	(6,183)

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, 2021	428	30,973	39,180	81,142	594	22,907	361	27,014	202,599
Exchange adjustments	(29)	(75)	(93)	(934)	(22)	(60)	(25)	(337)	(1,575)
Additions	16	1,673	2,610	4,552	54	24,086	93	1,200	34,284
Transfer from construction in progress	–	4,800	8,550	10,582	5	(27,936)	–	3,999	–
Disposals	–	(65)	(1,427)	(3,561)	(51)	(1)	–	(478)	(5,583)
Hyperinflation adjustments	–	–	1	75	9	2	–	49	136
At December 31, 2021	415	37,306	48,821	91,856	589	18,998	429	31,447	229,861
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 to investment property	**–**	**(340)**	**(77)**	**–**	**–**	**–**	**517**	**(31)**	**69**
Transfer from construction in progress	**–**	**4,374**	**6,971**	**11,411**	**1**	**(26,301)**	**–**	**3,544**	**–**
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**
Accumulated depreciation and impairment:									
At January 1, 2021	–	5,327	16,386	46,750	413	13	102	15,230	84,221
Exchange adjustments	–	(7)	(29)	(631)	(11)	–	(2)	(222)	(902)
Depreciation charge for the year	–	1,075	4,645	18,006	58	–	14	3,249	27,047
Impairment loss	–	–	34	(1)	–	–	–	(86)	(53)
Disposals	–	(42)	(1,054)	(3,150)	(47)	(7)	–	(414)	(4,714)
Hyperinflation adjustments	–	–	1	71	4	–	–	52	128
At December 31, 2021	–	6,353	19,983	61,045	417	6	114	17,809	105,727
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**
Carrying amount:									
At December 31, 2022	**415**	**34,017**	**31,941**	**33,311**	**179**	**22,343**	**1,221**	**13,597**	**137,024**
At December 31, 2021	415	30,953	28,838	30,811	172	18,992	315	13,638	124,134

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, 2022 and 2021, the Group did not hold any property, plant and equipment as collateral for liabilities or contingent liabilities.

Investment property

The fair value of investment property as at December 31, 2022 is estimated by management to be CNY1,479 million (2021: CNY488 million).

The fair value of investment property is determined by the Group with reference to market conditions and discounted cash flow forecasts, taking into account current lease agreements on an arm's length basis.

15 Goodwill and intangible assets

(CNY million)	Goodwill	Software	Patents and royalties (note (a))	Trademark and others	Total
Cost:					
At January 1, 2021	4,240	2,739	13,379	3,298	23,656
Exchange adjustments	(122)	(5)	(18)	(19)	(164)
Additions	–	73	983	589	1,645
Disposals	–	(311)	(818)	(637)	(1,766)
Others	(4)	–	–	–	(4)
At December 31, 2021	4,114	2,496	13,526	3,231	23,367
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**
Amortization and impairment:					
At January 1, 2021	3,876	1,829	7,306	1,476	14,487
Exchange adjustments	(103)	(5)	(14)	(11)	(133)
Amortization for the year	–	494	1,389	635	2,518
Impairment loss	11	–	–	–	11
Disposals	–	(270)	(755)	(595)	(1,620)
At December 31, 2021	3,784	2,048	7,926	1,505	15,263
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**
Carrying amount:					
At December 31, 2022	**318**	**555**	**5,735**	**1,440**	**8,048**
At December 31, 2021	330	448	5,600	1,726	8,104

(a) As at December 31, carrying amounts of patents and royalties are analyzed as follows:

(CNY million)	2022	2021
Patents	**4,507**	4,038
Royalties	**1,228**	1,562
	5,735	5,600

(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, 2022 and 2021, all of the carrying amount of goodwill is allocated across multiple cash-generating units and the amount so allocated to each unit is not significant.

(d) As at December 31, 2022 and 2021, 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)	2022	2021
Associates	**6,414**	3,864
Joint ventures	**695**	478
	7,109	4,342

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	
	2022	2021	2022	2021
Aggregate carrying amount	**6,414**	3,864	**695**	478
Aggregate amount of the Group's share of associates' and joint ventures'				
Profit for the year	**504**	12	**208**	28
Other comprehensive income	**(1)**	–	**–**	–
Total comprehensive income	**503**	12	**208**	28

17 Other investments and derivatives

(CNY million)	Note	2022	2021
Financial assets at amortized cost			
Fixed deposits		**72,183**	89,340
Debt securities	(i)	**60**	4,800
		72,243	94,140
Loss allowances		**(3)**	(7)
		72,240	94,133
Financial assets mandatorily at FVPL			
Investment funds	(ii)	**153,254**	193,325
Equity securities and beneficiary rights	(iii)	**62,495**	13,273
Compound financial instruments	(iv)	**3,946**	2,998
Foreign exchange derivatives		**305**	244
		220,000	209,840
Financial assets at FVOCI			
Debt securities	(i)	**9,077**	5,396
Equity securities	(iii)	**8,226**	9,008
		17,303	14,404
		309,543	318,377
Non-current portion		**83,055**	30,194
Current portion		**226,488**	288,183
		309,543	318,377

(i) Debt securities comprise investments in fixed rate bonds, floating rate notes, certificates of deposit, commercial papers, 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 CNY3 million as at December 31, 2022 (2021: CNY2 million).

(ii) Investment funds comprise short-term investments in 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 these investments amounted to CNY80 million (2021: CNY15 million) for the year ended December 31, 2022.

Certain equity investments at FVOCI were disposed of during the year ended December 31, 2022, and the corresponding cumulative gain in fair value reserve of CNY35 million was transferred to retained earnings upon disposal of these investments (2021: CNY362 million).

(iv) Compound financial instruments comprise equity instruments with redemption options and convertible notes which are designated at FVPL.

(v) As at December 31, 2022 and 2021, 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)	2022	2021
Accruals, defined benefit obligations, refund liabilities and unperformed obligations	**5,708**	5,161
Fair value changes of financial assets at FVOCI	**(1,078)**	(1,453)
Depreciation and impairment of property, plant and equipment	**(4,301)**	(3,175)
Unrealized profit	**4,736**	3,693
Tax losses	**3,654**	2,343
Undistributed profits of subsidiaries	**(1,129)**	(1,126)
Write down of inventories	**652**	613
Provision for loss allowances	**376**	358
Others	**(662)**	(356)
Total	**7,956**	6,058

Reconciliation to the summary consolidated statement of financial position:

(CNY million)	2022	2021
Net deferred tax assets recognized	**11,760**	10,340
Net deferred tax liabilities recognized	**(3,804)**	(4,282)
	7,956	6,058

(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, 2022, deferred tax assets have not been recognized in respect of unused tax losses amounting to CNY207,383 million (2021: CNY79,223 million) and deductible temporary differences amounting to CNY185,272 million (2021: CNY183,404 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 CNY4,408 million (2021: CNY1,079 million) have not been recognized as deferred tax assets.

During the year ended December 31, 2022, the tax credits relating to corporate income tax incurred by overseas subsidiaries totaling CNY3,862 million were certified and can be deducted for income tax purpose by the domestic parent company of relevant overseas subsidiaries within 5 years that follow.

19 Inventories and other contract costs

(CNY million)	2022	2021
Inventories		
Raw materials	**87,650**	91,620
Manufacturing work in progress	**28,751**	23,191
Finished goods and consumables	**29,036**	30,557
Dispatched goods and contract work in progress	**14,106**	12,730
Other inventories	**3,374**	2,980
	162,917	161,078
Other contract costs	**365**	228
	163,282	161,306

As at December 31, 2022 and 2021, 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)	2022	2021
Carrying amount of inventories sold	**271,396**	250,942
Write-down of inventories	**6,196**	1,387
	277,592	252,329

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, 2022 or 2021.

20 Contract assets

(CNY million)	2022	2021
Gross carrying amount	**52,821**	52,810
Loss allowances (note 21(b))	**(294)**	(266)
	52,527	52,544
Non-current portion	**1,025**	1,207
Current portion	**51,502**	51,337
	52,527	52,544

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)	2022	2021
At January 1	**52,810**	53,924
Addition during the year	**47,836**	49,025
Transfers to receivables or reversal during the year	**(48,640)**	(48,765)
Exchange adjustments	**815**	(1,374)
At December 31	**52,821**	52,810

21 Trade and bills receivable

(CNY million)	Note	2022	2021
Trade receivables			
Trade receivables from third parties	(i)	**87,143**	72,063
Trade receivables from related parties	31	**34**	179
		87,177	72,242
Bills receivable			
Bank acceptance bills		**809**	1,290
Commercial acceptance bills		**1,647**	4,807
Letters of credit		**1,244**	1,008
	(ii)	**3,700**	7,105
		90,877	79,347
Non-current portion		**3,073**	3,113
Current portion		**87,804**	76,234
		90,877	79,347

(i) As at December 31, 2022, the Group's trade receivables that may be sold through reverse factoring arrangements amounted to CNY7,112 million (2021: CNY6,085 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)	2022	2021
Not past due	**65,195**	55,893
Less than 90 days past due	**16,108**	12,693
90 days to 1 year past due	**6,876**	4,900
1 year and above past due	**2,170**	1,611
	90,349	75,097
Loss allowances	**(3,172)**	(2,855)
	87,177	72,242

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	2022	2021
At January 1		**3,148**	3,762
Loss allowances recognized/(reversals)		**297**	(423)
Uncollectible amounts written-off		**(472)**	(125)
Collection of previously written-off debtors		**154**	28
Disposal of a subsidiary		**(1)**	–
Exchange adjustments		**371**	(94)
At December 31		**3,497**	3,148
Representing loss allowances			
– on trade receivables		**3,172**	2,855
– on contract assets	20	**294**	266
– included in OCI on trade receivables at FVOCI		**31**	27
Total		**3,497**	3,148

Loss allowances recognized on trade receivables and contract assets are included in selling and administrative expenses.

During the year ended December 31, 2022, apart from exchange adjustments, 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. Uncollectible amounts written-off were mainly due from certain customers in Southern Africa.

(c) Transferred trade receivables not derecognized in their entirety

As at December 31, 2022, the Group's undue trade receivables with the face value of CNY9 million (2021: CNY13 million) have been transferred to banks and the Group received the corresponding remittance of CNY9 million (2021: CNY13 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, 2022, the Group's trade receivables with the carrying amount of CNY3,256 million (2021: CNY3,092 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 CNY567 million (2021: CNY595 million) and associated liabilities of CNY610 million (2021: CNY641 million) to the extent of its continuing involvement. The associated liabilities are included in other liabilities. As at December 31, 2022, loss allowances of CNY405 million (2021: CNY419 million) were made on these transferred receivables.

(d) Collateral

As at December 31, 2022 and 2021, 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	2022	2021
Advance payments to suppliers		**47,386**	25,386
Tax receivables on unbilled deliveries	(i)	**4,963**	4,988
Income tax related assets		**1,488**	1,612
Other tax related assets		**13,255**	10,563
Pledged and restricted deposits with banks		**1,608**	1,709
Other third party receivables		**33,968**	24,447
Other long-term deferred assets		**1,131**	744
Related party receivables	31	**386**	263
Prepayment for acquisition of long-term assets		**8,881**	4,703
Assets held for sale		**13**	1
		113,079	74,416
Non-current portion		**14,628**	10,493
Current portion		**98,451**	63,923
		113,079	74,416

(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)	2022	2021
Cash on hand	**7**	6
Deposits with banks and other financial institutions	**138,999**	122,276
Highly liquid short-term investments	**8,131**	5,931
Deposits with third party merchants	**132**	182
	147,269	128,395

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, 2022, these short-term investments comprised reverse repurchase agreements with maturities of less than three months of CNY500 million (2021: CNY3,300 million), and money market funds of CNY7,631 million (2021: CNY2,591 million). The short-term investments in December 31,2021 also include the fixed income broker structured notes of CNY40 million. Money market funds comprise investments in short-term debt securities which have constant or low volatility net asset values and are measured at FVPL.

As at December 31, 2022, cash and cash equivalents of CNY836 million (2021: CNY531 million) were held in countries where exchange controls or other legal restrictions were in force.

As at December 31, 2022, the Group held cash equivalent to CNY8,312 million (2021: CNY3,671 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, 2022 and 2021, 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)	2022	2021
Short-term loans and borrowings:		
– Unsecured	**228**	138
Long-term loans and borrowings:		
– Intra-group guaranteed	**205**	421
– Trade receivables financing (note 21(c))	**9**	13
– Unsecured	**140,484**	122,963
– Corporate bonds	**56,218**	51,565
	196,916	174,962
	197,144	175,100
Non-current portion	**183,183**	162,276
Current portion	**13,961**	12,824
	197,144	175,100

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, 2022

(CNY million)		Interest rate	Total	1 year or less	1 to 5 years	Over 5 years
Intra-group guaranteed bank loans:						
CNY	variable	**4.26% p.a.**	**205**	**182**	**23**	**–**
Trade receivables financing:						
United States Dollar (USD)	variable	**4.92% p.a.**	**9**	**2**	**6**	**1**
Unsecured bank loans:						
CNY	variable	**2.95% ~ 4.31% p.a.**	**102,764**	**135**	**21,388**	**81,241**
Euro (EUR)	variable	**2.36% ~ 3.05% p.a.**	**5,266**	**–**	**4,291**	**975**
Hong Kong Dollar (HKD)	variable	**5.26% ~ 6.51% p.a.**	**22,039**	**–**	**17,663**	**4,376**
Saudi Arabian Riyal (SAR)	variable	**1.80% ~ 4.75% p.a.**	**43**	**43**	**–**	**–**
Bahrain Dinar	variable	**5.80% p.a.**	**104**	**104**	**–**	**–**
Nigerian Naira	fixed	**19.00% p.a.**	**75**	**75**	**–**	**–**
EUR	fixed	**1.75% p.a.**	**6**	**6**	**–**	**–**
USD	variable	**5.62% ~ 5.68% p.a.**	**10,415**	**10,415**	**–**	**–**
			140,712	**10,778**	**43,342**	**86,592**
Corporate bonds:						
CNY	fixed	**2.87% ~ 3.65% p.a.**	**31,954**	**2,999**	**28,955**	**–**
USD	fixed	**4.00% ~ 4.13% p.a.**	**24,264**	**–**	**24,264**	**–**
			56,218	**2,999**	**53,219**	**–**
			197,144	**13,961**	**96,590**	**86,593**

At December 31, 2021

(CNY million)		Interest rate	Total	1 year or less	1 to 5 years	Over 5 years
Intra-group guaranteed bank loans:						
South African Rand	variable	5.43% p.a.	57	57	–	–
CNY	variable	4.31% p.a.	364	159	205	–
			421	216	205	–
Trade receivables financing:						
USD	variable	3.48% p.a.	13	5	6	2
Unsecured bank loans:						
CNY	variable	3.65% ~ 4.55% p.a.	88,107	95	49,143	38,869
EUR	variable	0.80% ~ 1.00% p.a.	5,116	–	1,900	3,216
Hungarian Forint	fixed	4.36% p.a.	55	–	–	55
HKD	variable	1.00% ~ 1.54% p.a.	20,157	–	12,045	8,112
SAR	variable	2.89% ~ 3.90% p.a.	134	134	–	–
Mexican Peso	fixed	16.40% p.a.	4	4	–	–
USD	variable	1.11% ~ 1.13% p.a.	9,528	–	9,528	–
			123,101	233	72,616	50,252
Corporate bonds:						
CNY	fixed	3.09% ~ 3.65% p.a.	22,965	5,995	16,970	–
USD	fixed	3.25% ~ 4.13% p.a.	28,600	6,375	19,060	3,165
			51,565	12,370	36,030	3,165
			175,100	12,824	108,857	53,419

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, 2022 and 2021, 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	June 24, 2020	3,000	3.280%	3 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

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, 2022

Related liabilities (CNY million)	Other loans and borrowings	Corporate bonds	Long-term assets installments	Lease liabilities	Interest payable related to financing activities
Balance at January 1, 2022	**123,535**	**51,565**	**1,998**	**9,504**	**886**
Proceeds from borrowings	**70,741**	**23,960**	**–**	**–**	**–**
Repayment of borrowings	**(55,355)**	**(21,338)**	**–**	**–**	**–**
Long-term assets acquired	**–**	**–**	**127**	**–**	**–**
Installment payments	**–**	**–**	**(535)**	**–**	**–**
New leases	**–**	**–**	**–**	**4,385**	**–**
Payment of lease liabilities	**–**	**–**	**–**	**(3,242)**	**–**
Interest incurred during the year	**–**	**–**	**–**	**417**	**7,127**
Interest paid	**–**	**–**	**–**	**(288)**	**(6,692)**
Amortization of capitalized interests and transaction costs	**85**	**54**	**40**	**–**	**–**
Non-cash transactions (note)	**(900)**	**–**	**–**	**–**	**–**
Termination of leases	**–**	**–**	**–**	**(84)**	**–**
Exchange adjustments	**2,820**	**1,977**	**17**	**(121)**	**23**
Balance at December 31, 2022	**140,926**	**56,218**	**1,647**	**10,571**	**1,344**

Year ended December 31, 2021

Related liabilities (CNY million)	Other loans and borrowings	Corporate bonds	Long-term assets installments	Lease liabilities	Interest payable related to financing activities
Balance at January 1, 2021	97,622	44,189	3,261	9,650	591
Proceeds from borrowings	55,063	10,976	–	–	–
Repayment of borrowings	(26,233)	(3,000)	–	–	–
Long-term assets acquired	–	–	58	–	–
Installment payments	–	–	(1,248)	–	–
New leases	–	–	–	3,557	–
Payment of lease liabilities	–	–	–	(3,088)	–
Interest incurred during the year	–	–	–	381	5,729
Interest paid	–	–	–	(247)	(5,360)
Amortization of capitalized interests and transaction costs	123	47	66	–	–
Non-cash transactions (note)	(1,322)	–	–	–	–
Termination of leases	–	–	–	(181)	–
Exchange adjustments	(1,718)	(647)	(139)	(568)	(74)
Balance at December 31, 2021	123,535	51,565	1,998	9,504	886

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 derecognized 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	2022	2021
Trade payables			
Related party trade payables	31	**1,054**	839
Third party trade payables		**84,218**	80,855
		85,272	81,694
Bills payable			
Bank acceptance bills		**1,745**	–
Letters of credit payable		**5,087**	–
		6,832	–
		92,104	81,694

26 Contract liabilities

(CNY million)	2022	2021
Consideration received in advance of performance	**16,041**	10,686
Billing in advance of performance	**71,534**	67,463
	87,575	78,149

Significant changes in contract liabilities during the year are as follows:

(CNY million)	2022	2021
At January 1	**78,149**	71,948
Revenue recognized that was included in the contract liability balance at the beginning of the year	**(62,204)**	(48,843)
Increases due to cash received or billing for unperformed obligations	**69,848**	57,552
Exchange adjustments	**1,782**	(2,508)
At December 31	**87,575**	78,149

27 Other liabilities

(CNY million)	Note	2022	2021
Accrued expenses		**23,480**	26,522
Refund liabilities	(i)	**14,883**	13,092
Other taxes payable		**14,112**	11,256
Due in relation to property, plant and equipment		**11,430**	8,003
Due in relation to intangible assets		**2,051**	2,219
Foreign exchange derivatives	(ii)	**173**	210
Others		**50,905**	38,163
		117,034	99,465
Non-current portion		**2,608**	2,754
Current portion		**114,426**	96,711
		117,034	99,465

(i) Refund liabilities mainly comprise the rebates and other sales-based incentives to customers.

(ii) As at December 31, 2022, the carrying value of the foreign exchange derivatives held as hedging instruments amounted to CNY30 million (2021: nil).

28 Provisions

(CNY million)	Note	2022	2021
Warranties	(b)	**4,793**	3,269
Onerous contracts with customers		**719**	722
Onerous contracts with suppliers	(c)	**8,309**	11,031
Others	(d)	**2,761**	2,421
		16,582	17,443

(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, 2022	**3,269**	**722**	**11,031**	**2,421**	**17,443**
Provisions made/(reversals)	**5,986**	**294**	**(2,274)**	**192**	**4,198**
Provisions utilized	**(4,518)**	**(307)**	**(448)**	**(125)**	**(5,398)**
Exchange adjustments	**56**	**10**	**–**	**273**	**339**
At December 31, 2022	**4,793**	**719**	**8,309**	**2,761**	**16,582**

(b) Warranties

The provision for warranties is determined based on estimates made from historical warranty data associated with similar products and 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(c), 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, 2021	10,994	12,621	1,414	25,029
Exchange adjustments	2	(650)	(74)	(722)
Additions	3,681	2,973	583	7,237
Derecognition	–	(1,493)	(316)	(1,809)
Hyperinflation adjustments	–	62	–	62
At December 31, 2021	14,677	13,513	1,607	29,797
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**
Accumulated depreciation and impairment:				
At January 1, 2021	1,218	4,659	729	6,606
Exchange adjustments	–	(267)	(47)	(314)
Depreciation charge for the year	240	2,713	468	3,421
Impairment loss	–	(26)	–	(26)
Derecognition	–	(1,290)	(315)	(1,605)
Hyperinflation adjustments	–	49	–	49
At December 31, 2021	1,458	5,838	835	8,131
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**
Carrying amount:				
At December 31, 2022	**13,691**	**8,797**	**798**	**23,286**
At December 31, 2021	13,219	7,675	772	21,666

During the years ended December 31, 2022 and 2021, 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	2022	2021
Interest expenses on lease liabilities	11	**417**	381
Expenses relating to short-term leases		**544**	681
Expenses relating to leases of low-value assets, excluding short-term leases of low-value assets		**31**	33
Variable lease payments not included in the measurement of lease liabilities		**39**	14
Income from subleasing right-of-use assets		**92**	75

(iii) Amounts recognized in summary consolidated statement of cash flows

(CNY million)	2022	2021
Total cash outflow for leases	**4,723**	5,923

(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)	2022	2021
Within 1 year	**115**	80
After 1 year but within 2 years	**104**	49
After 2 years but within 3 years	**78**	31
After 3 years but within 4 years	**76**	12
After 4 years but within 5 years	**73**	11
After 5 years	**324**	66
	770	249

30 Capital commitments

(CNY million)	2022	2021
Contracted for acquisition and construction of long-term assets	**21,843**	16,430
Investment commitment	**1,096**	1,939
	22,939	18,369

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	
	2022	2021
Sales of goods and services	**554**	1,588
Purchase of goods and services	**2,400**	2,256

Balances with related parties

(CNY million)	Associates	
	December 31, 2022	December 31, 2021
Trade receivables	**34**	179
Contract assets	**84**	8
Other assets	**386**	263
Trade payables	**1,054**	839
Contract liabilities	**18**	118
Other liabilities	**76**	222

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
		2022	2021	
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 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., Ltd.	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., Ltd.	Chinese mainland	**100%**	100%	Development, manufacture and sale of optoelectronic products related to information technology
Huawei Digital Technologies (Suzhou) Co., Ltd.	Chinese mainland	**100%**	100%	Development and sale of inverter
Huawei Technologies Coöperatief U.A.	Netherlands	**100%**	100%	Intermediate parent company for certain overseas subsidiaries

(c) Acquisition of a subsidiary

The Group did not acquire any subsidiary for the year ended December 31, 2022.

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 and January 18, 2023, respectively, requesting the trial to be postponed, and such motions were granted by the judge. Pursuant to the judge's decision on January 20, 2023, the trial will be continued until October 28, 2024. 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 Sale of business and subsidiaries

In 2020 and 2021, the Group entered into agreements with third-party buyers respectively to sell the Honor business and certain subsidiaries engaged in manufacturing and sales of server products. Transfer of related assets and liabilities was completed in 2021. The disposal gains of these transactions were recorded in "gain on disposal of subsidiaries and businesses" within other income, net (note 9), and consideration received, net of cash disposed of, was presented within investing cash flows in 2021. According to the contract terms, the buyers for both transactions should pay the considerations in installments, and there exists uncertainty over the ultimate considerations the Group is entitled to. Therefore, the financial instruments arising from both transactions were measured at fair value through profit or loss.

In 2022, fair value changes in these financial instruments are recorded in "fair value changes in financial instruments arising from disposals of subsidiaries and businesses" within other income, net (note 9). Cash receipts on the financial instruments are presented within investing cash flows. The financial instruments arising from these two transactions, being a financial asset and a financial liability respectively, are included in other assets and other liabilities as at December 31, 2022.

Subsequent to December 31, 2022, the Group and the buyer of the Honor business amended certain terms. The supplementary agreement has not yet come into effect as of the date of approval of these financial statements.

35 Subsequent events

(a) Subsequent to December 31, 2022 and up to the date of approval of these financial statements, the Group has issued three tranches of 5-year medium-term notes and a super short-term commercial paper, with an aggregate principal amount of CNY12,000 million.

(b) Subsequent to December 31, 2022 and up to the date of approval of these financial statements, the Group has drawn accumulatively CNY55,000 million from a credit facility and a syndicated loan facility entered into by Huawei Technologies Co., Ltd., a wholly-owned subsidiary of the Group.

36 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

Huawei's risk factors refer to factors that could make the company's ultimate achievement of its business objectives uncertain. Such factors are identified 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 evaluate our risk management system. Huawei's ERM system ensures the following:

- The Board of Directors approves the company's 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. We first systematically identify and assess risks during strategic planning. Then, we formulate appropriate countermeasures during annual business planning, and monitor and report on risks as part of our key task management during routine operations. Huawei ensures uninterrupted business operations by identifying major risk factors during strategic decision making and planning, and taking necessary measures to control risks during business planning and execution.

Strategic Risks

Digital technology is reshaping the world around us. Humankind will enter an intelligent world over the next two to three decades and we want to make sure that this future is inclusive so that everyone can benefit from the changes brought by digital technology. Mature commercial applications of new technologies – particularly 5G, cloud computing, AI, and blockchain – are speeding up the digital transformation of all industries. This presents enormous opportunities.

That said, Huawei's external environment is more volatile and complicated 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 efforts to continue containing 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. This combination of industry digitalization and green and low-carbon development will present tremendous growth opportunities in both the information processing and communications industries.

Huawei will focus on leveraging its ICT strengths to enable the digital transformation of all industries, and work 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. We will also continue to build diverse ecosystems that do not depend on any one country. We will keep enhancing our software engineering capabilities, pressing ahead with our US$2 billion five-year budget for building quality, trustworthy products and solutions.

External Risks

Macro environment: We expect growth to slow in many economies in 2023, and some may even experience significant declines. Furthermore, an overall rise in prices and interest rates will reduce consumer purchasing power and many companies will feel the impact of this on their business and profit margins. This will in turn delay investment. 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, etc.

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 2022, the complicated international geopolitical environment hugely impacted global trade. The lingering impact of the pandemic and regional conflicts has stalled trade growth and decreased import demand in major economies. Additionally, rising food and energy prices, and a sustained imbalance between supply and demand, have driven up inflation. Supply chain volatility has also forced many economies to pursue supply diversification, and the value chain policies being adopted by some countries are reshaping the global trade landscape.

With the imminent risk of an economic downturn, many are expecting policies that spur production and lift trade restrictions. Discriminatory policies will only exacerbate price hikes and undermine global interests. Huawei embraces free trade, open markets, and fair competition. We will continue to support equitable and non-discriminatory multilateral trade rules and place trade compliance above our own commercial interests.

At Huawei, we believe that the application of emerging technologies and ongoing innovation in these fields, as well as sustained digitalization and decarbonization, will help all countries better tackle the many uncertainties in our shared macro environment and inject vitality into international trade.

Natural disasters: It is our mission and primary social responsibility to maintain stable network operations. Earthquakes, typhoons, floods, and other natural disasters can impact Huawei's business operations in many different ways and thus can impact the operations of the networks we have deployed. We have robust mechanisms for responding to natural disasters and are continuing to improve our capabilities in this regard. This has helped us to ensure our own business continuity, and more importantly, effectively support our customers' network stability.

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 2023, developed economies will likely continue tightening monetary policies to curb inflation. Global economic growth will also likely continue slowing. This tightening financial environment will deal a blow to emerging markets with heavier debt loads. In response to these risks, 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

Business continuity: In today's highly globalized and highly specialized world, Huawei's operations rely heavily on third parties. This makes business continuity management (BCM) critical. Through years of sustained investment, Huawei has established a BCM system for domains such as R&D, procurement, manufacturing, logistics, and global technical services. This system covers our end-to-end processes, from suppliers to Huawei and on to our customers. As part of this system, we have developed and established effective measures to drive BCM and emergency response upskilling across organizations, allowing them to manage risks that arise during their daily work. Specifically, we have built up management organizations, processes, and IT platforms, embedded key BCM elements into our product development and supply management, prepared business continuity plans and emergency management plans, and organized BCM training and drills for employees.

(For further information, see the Improving the Management System section on pages 72 to 73 of this report.)

Information security and IP: Although Huawei has adopted stringent information security measures to protect its IP, it is impossible to completely prevent the improper use of our proprietary information. Even when we are able to protect our IP through judicial means, we may still suffer losses due to improper usage.

Huawei has long been dedicated to independent innovation and IP protection. We have a complete IP risk control system in place. Despite this, there still exists the possibility that rights holders may file IP claims against Huawei or third parties may infringe upon our patents, trademarks, or copyrights. Huawei proactively addresses these risks to safeguard our business operations.

Financial Risks

For further information, see pages 91 to 92 of this report.

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

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"), which involved 142,315 individuals, either current employees or retired beneficiaries, as of December 31, 2022. 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, 2022, Mr. Ren's investment accounts for nearly 0.73% of the company's total share capital.

The Shareholders' Meeting and the Representatives' Commission

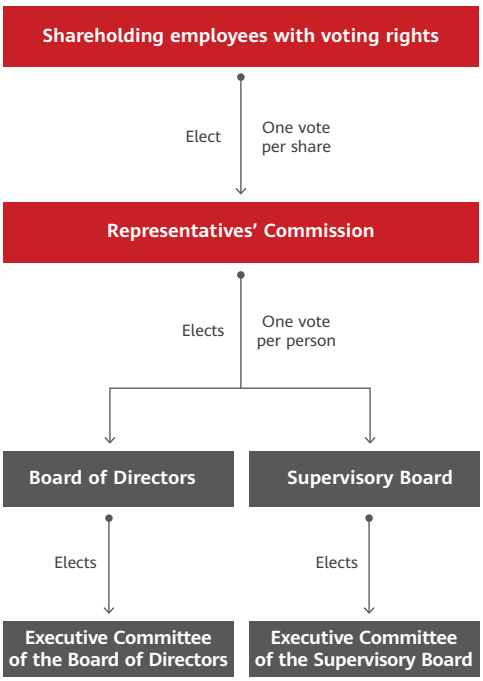
The Shareholders' Meeting, the company's authoritative body, comprises two shareholders: the Union and Mr. Ren Zhengfei.

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 2022, the Commission held one meeting. At the meeting, a new Supervisory Board was elected, resulting in a new set of regular and alternate members. 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 2022.

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, Mr. Xu Wenwei, 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. Peng Song, 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. Zhou Taoyuan, Mr. Wang Yixiang, Mr. Li Zhoujian, Mr. Yu Quan, 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, Mr. Ye Xiaowen, 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 industry sectors, 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 2022, the BOD held 11 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, Chairman of the Investment Review Board, President of the Enterprise BG, and Chairman of the Board of Directors of Huawei Cloud Computing Technologies.

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, CEO 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. Currently, Mr. Zha serves as Director of the 2012 Laboratories, President of the Central Research Institute, 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 2022, the BOD Executive Committee held 18 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:

- Ms. Meng Wanzhou:

  April 1, 2023 to September 30, 2023

- Mr. Hu Houkun:

  October 1, 2023 to March 31, 2024

- Mr. Xu Zhijun:

  April 1, 2024 to September 30, 2024

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 2022, the committee held eight meetings, focusing on topics such as anti-corruption, internal controls, internal and external audits, the oversight plans of level-1 organizations, and accountability and follow-up regarding issues identified in audit reports. At the meetings, the AC reviewed and approved the company's annual plans for internal controls and internal and external audits, and the annual oversight plans of level-1 organizations like the ICT infrastructure business, consumer business, Digital Power, and Huawei Cloud Computing. The AC also reviewed improvements regarding high-risk practices and issues surrounding labor outsourcing and contract signing authorization. In addition, the committee Chairman and the external auditor discussed the issues identified through the external audit, external audit plans, and proposals for Huawei's management improvements.

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 2022, 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 2022, the Supervisory Board held 12 meetings, and its members attended all BOD meetings as non-voting participants, overseeing the legitimacy of BOD decisions and operations, 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 2022, 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.

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.

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, and a member of the Platform Coordination Committee. Currently, Mr. Song serves as a member of the Supervisory Board, Chief Legal Officer, and Chief Compliance 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 and Chief Logistics Officer.

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.

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.

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, and President of the West European Region. Currently, Mr. Li serves as a member of the Supervisory Board and President of the Carrier BG.

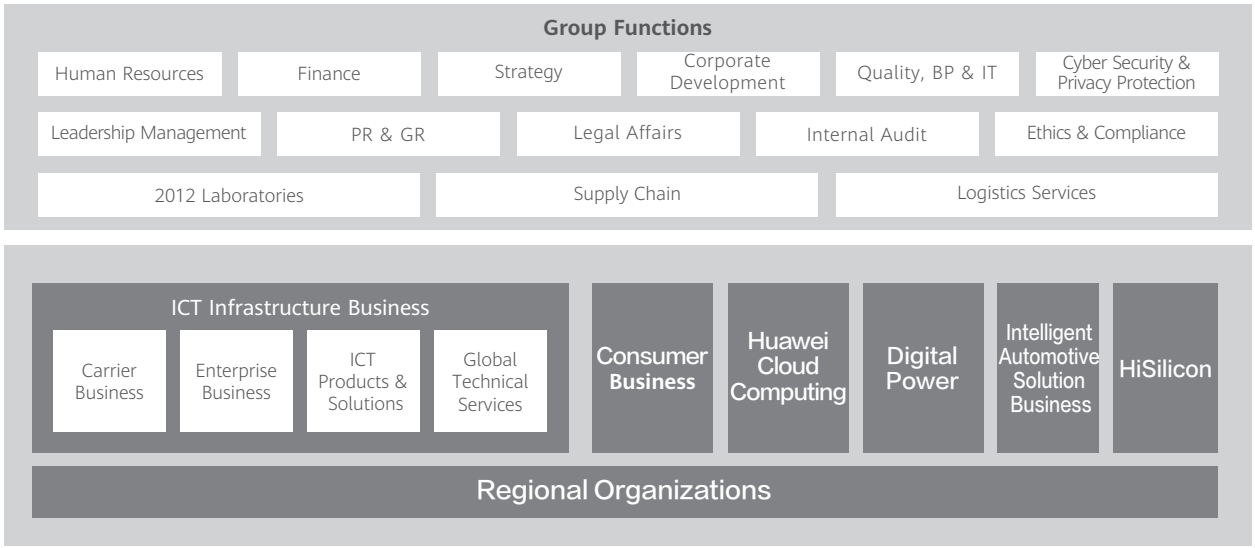
Independent Auditor

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 works on information distribution, interaction, transmission, processing, and storage, aiming to help customers build CT and IT infrastructure with its leading, innovative products, solutions, and services.

- The ICT infrastructure business comprises the carrier and enterprise businesses. Based on innovative products and solutions, the ICT infrastructure business works to build an open ecosystem, and serve carriers, governments, and enterprises, and more broadly, every person, home, and organization.

- ICT Products & Solutions comprises connectivity and computing businesses. In connectivity, Huawei proactively works with industry partners to define 5.5G, as part of the effort to continuously drive this industry forward. In computing, Huawei works alongside partners around the world to develop digital infrastructure ecosystems centered on Kunpeng, Ascend, and Euler-related foundational software, lay the computing foundation for the digital world, deliver better service experience, and facilitate customers' business success.

- Based on its over 30 years of delivery and service experience, Global Technical Services provides service and software solutions for carriers, governments, and enterprises. Focusing on the entire lifecycle of a network, including network planning, construction, operations and maintenance (O&M), and optimization, Global Technical Services works with its partners to continuously improve customer satisfaction. Global Technical Services is committed to building green, efficient, secure, and robust ICT infrastructure that delivers ultimate experience to customers, and enabling the transformation of industries towards digital intelligence.

The consumer business puts users at the center of everything it does and is committed to creating a Seamless AI Life experience centered on products. Focusing on five key scenarios (Smart Home, Smart Office, Easy Travel, Fitness & Health, and Entertainment), the consumer business aims to deliver a superior user experience, build an ecosystem alongside its partners, and achieve business success.

Huawei Cloud Computing provides stable, reliable, secure, trustworthy, and innovative cloud services to customers. By diving into digital, Huawei Cloud Computing aims to deliver Everything as a Service 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, 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, energy-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

Enterprises that want to build quality brands with a competitive edge in the global market should create social value in business activities through sustainability efforts, and seize new business opportunities while creating social value. This will form a positive cycle that allows enterprises in this globalized world to continue to grow and prosper.

In 2022, despite continued external volatility, Huawei remained focused, stayed true to its vision and mission, and maintained its commitment to building the foundations of the digital economy. In collaboration with our partners, we continued to work on our four sustainability strategies: digital inclusion, security and trustworthiness, environmental protection, and a healthy and harmonious ecosystem. By doing this, we wanted to create even greater value for our customers, partners, and society at large.

Overview of Huawei's Sustainability Strategies and Initiatives in 2022

Digital Inclusion

TECH4ALL: Since the launch of Huawei's TECH4ALL digital inclusion initiative in 2019, we have worked closely with our partners on projects that aim to foster a more inclusive, sustainable world using digital technology.

220,000

TECH4ALL's education programs have benefited over 600 schools and more than 220,000 people, including K–12 students and teachers, unemployed young people, and senior citizens.

46

Huawei's digital technologies have helped conserve biodiversity efficiently and manage natural resources sustainably in 46 protected areas.

12,000

More than 12,000 senior citizens in China attended online and offline digital skills training offered by Huawei and the Beijing University for Seniors at community centers and nursing homes.

400 million

Huawei provided inclusive financial services to over 400 million people in more than 20 countries around the world.

Security and Trustworthiness

Taking responsibility to build trust: Cyber security and privacy protection are a top priority at Huawei, and we continue to invest and remain transparent in both areas. We have worked to improve our software engineering capabilities and practices, build resilient networks, develop trustworthy and high-quality products, and support stable network operations and business continuity.

30

Huawei was awarded over 30 cyber security certificates, giving our customers internationally recognized security assurances.

25,000

Huawei handled over 25,000 requests from data subjects promptly and effectively as part of its efforts to respect and protect user privacy.

50

Huawei passed over 50 certifications and audits, ensuring that its corporate privacy protection policies are well enforced.

300

Huawei supported stable communications during over 300 major events and emergencies.

Environmental Protection

Contributing to a clean, efficient, low-carbon, and circular economy: We are committed to minimizing our environmental impact in manufacturing, operations, and over the entire lifecycles of our products and services. Huawei's innovative products and solutions help industries reduce their energy consumption and emissions, and contribute to the circular economy. We actively work with all our industry partners to shrink our carbon footprint.

695.1 billion

Huawei's digital power solutions have helped customers generate 695.1 billion kWh of green power and save 19.5 billion kWh of electricity.

100%

Huawei's Shenzhen and Dongguan campuses are now 100% powered by clean energy.

600,000

Nearly 600,000 used devices have been resold through Huawei's trade-in program.

0.63%

Only 0.63% of the e-waste from Huawei's ICT business went to landfills, and no e-waste from our consumer business went to landfills.

Healthy and Harmonious Ecosystem

Collaborating for the common good: We are committed to operating with integrity and complying with all applicable laws and regulations, and continue to enhance sustainability risk management. We work to ensure that our employees can develop and realize their personal value. We conduct due diligence on our global supply chain to ensure its sustainability. 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.

CNY17 billion

Huawei invested over CNY17 billion in employee benefits.

66 hours

Every Huawei employee received an average of 66 hours of training.

1,600

Huawei assigned CSR risk ratings to over 1,600 major suppliers, representing over 90% of our procurement spending.

270

Huawei operated over 270 social contribution programs worldwide.

2022 Sustainability Honors and Awards

Honor/Award Name	Issued by
Climate A List	CDP
Excellent Environmental Leadership Award	CDP
Best Practices for Achieving SDGs in 2021 (Protecting the Environment & Addressing Climate Change)	Global Compact Network China
Huawei Intelligent Net-Zero Carbon Campus Solution: WSIS Prize 2022 Champion	ITU
DigiTruck in Kenya: Global Mobile (GLOMO) Award for Outstanding Mobile Contribution to the UN SDGs	GSMA
Forerunner in Green Development	China Environmental United Certification Center Co., Ltd.
Prime Minister Awards – Thailand Cybersecurity Excellence Award 2022	Thai National Cyber Security Agency
Top Employer in Europe and Northern Africa	Top Employers Institute
Outstanding Achievement for Customer Centricity	European Foundation for Quality Management (EFQM)
The Leaders Award for digital transformation in Egypt	Alam Al-Mal, a national media outlet in Egypt
Best Employer in Côte d'Ivoire	Côte d'Ivoire's Ministry of Employment and Social Protection
ICT Industry and Talent Development Award issued by the Prime Minister of Tunisia	Tunisia's Ministry of Economy and Planning
Huawei International Pte. Ltd.: Data Protection Trustmark (DPTM) certification	Singapore's Infocomm Media Development Authority (IMDA)
Hong Kong Authorized Economic Operator Partnership Scheme Gold Award	Hong Kong Customs
Corporate Startup Star Award	Mind the Bridge and International Chamber of Commerce (ICC)
2022 ESG Innovator for New Growth in China	Harvard Business Review (Chinese Edition)

Digital Inclusion

As the digital economy continues to develop rapidly, digital technologies like big data, IoT, and AI have been woven into every aspect of our lives. This makes digital inclusion critical in this new age. And so, Huawei launched the TECH4ALL initiative to promote digital inclusion, aiming to leave no one behind in the digital world.

In 2022, Huawei worked with more than 40 partners, including UNESCO and the International Union for Conservation of Nature (IUCN), and made substantial progress in TECH4ALL's four areas of focus: education, environment, health, and development. Our efforts continue to support the UN SDGs and are helping foster an inclusive, sustainable digital world.

Driving Equity and Quality in Education

UNESCO believes that education is a basic right for all throughout life and that access must be matched by quality. As part of our work to contribute to UN SDG 4 (Quality Education), Huawei is working with partners, including UNESCO and Close the Gap, to use innovative ICT solutions to enable equal access to high-quality education. We aim to harness the power of technology and increase network coverage and connections to help make high-quality educational resources more accessible. We want to empower more people with digital skills to improve education quality and drive career development. We also support the development of science and technology courses to improve the scientific and technological literacy of teachers and students in remote areas. By the end of 2022, Huawei's TECH4ALL education programs had benefited over 600 schools and more than 220,000 people, including teachers and students, unemployed young people, and senior citizens.

Technology-enabled Open School Systems for All

UNESCO, the ministries of education of Egypt, Ethiopia, and Ghana, and Huawei have jointly implemented a project to design, pilot test, and scale up Technology-enabled Open School Systems. This project aims to promote the open school model by providing device access, network connectivity, and education cloud platforms. As part of this program, we build online learning platforms, provide digital skills training to teachers and students, and develop quality courses for pilot countries. Our goal is to ensure the continuity and quality of learning under both normal and crisis situations and provide inclusive, equitable quality education for all children.

In 2022, we visited pilot schools to assess their existing digital tools and provide digital skills training to seed teachers, and also released a policy framework. In Ghana and Ethiopia, we provided technical solutions and evaluation reports for 34 pilot schools to help them make better use of open learning resources. In Egypt, we launched a training program to help teachers in underserved communities improve their ICT and distance learning capabilities. So far, 300 teachers have been trained through this program.

The Open Schools project provides digital skills training to teachers in Ethiopia

DigiSchool in China: Improving Scientific and Technological Literacy in K–12 Schools

To improve the scientific and technological literacy of teachers and students in rural schools, Huawei launched the DigiSchool project in China in partnership with universities and other partners. Through this project, we developed a series of inquiry-based and multidisciplinary science and technology courses based on the STEAM education approach, K–12 education curriculum guide, and cutting-edge ICT know-how and practices. The courses were delivered by university volunteers, Huawei's retired employee volunteers, and teachers from local schools.

By the end of 2022, the courses had been delivered in 20 rural elementary schools in Ningxia and Jiangxi provinces, benefiting more than 2,500 teachers and students. This program has improved rural teachers' digital literacy and inspired new curiosity into science and technology among students.

The DigiSchool at No. 18 Elementary School of Xixia District, Yinchuan, Ningxia, China

Conserving Nature with Technology

According to a report released by the United Nations Environment Programme, biodiversity loss is one of the three main environmental crises facing humanity. The 2022 UN Biodiversity Conference (COP 15) ended with a landmark agreement to protect at least 30% of Earth's lands and oceans. Under this agreement, signatories must take immediate action to not only jumpstart the implementation of the new Global Biodiversity Framework, but also to continue to accelerate and upscale the implementation of their National Biodiversity Strategies and Action Plans as we work together towards realizing the shared vision of living in harmony with nature and securing a sustainable future for all. Huawei is working closely with global environmental protection organizations, customers, and partners on projects that explore the use of ICT to protect forests, wetlands, and oceans, and increase the efficiency of biodiversity and natural resource protection and management.

Nature Guardians

Huawei and Rainforest Connection (RFCx) are using the solar-powered Nature Guardian acoustic monitoring system, enabled by Huawei's cloud and AI technologies, to identify the sounds from the surrounding environment. This system helps rangers identify sounds of environmental threats in real time and allows conservationists to study and protect local biodiversity based on the collected acoustic data. By the end of 2022, Nature Guardians had been deployed in 37 protected areas around the world, covering forests, wetlands, and oceans.

In Austria's Neusiedler See-Seewinkel National Park, the acoustic data collected by the Nature Guardian system gives conservationists insights into the status of the wetland and helps them study its effect on birds and amphibians in different seasons.

In Italy, Huawei and the World Wide Fund for Nature (WWF) have launched two projects. The first project aims to prevent illegal activities such as bird trapping, motocross, and firework displays in the three protected oases using the Nature Guardian system. So far, the devices have sent over 2,000 real-time alerts on sounds potentially associated with illegal activities, prompted over 30 field checks, and helped automatically recognize 49 species. The second project selected eight farms between the Alps to Sicily. A cloud- and AI-powered monitoring system has been deployed to compare biodiversity in agricultural areas managed using organic methods with biodiversity in areas managed using conventional methods. The goal of this project is to develop inclusive, healthy, and sustainable agricultural practices.

In Sarawak, Malaysia, Huawei and its partner also provided technical training to local forest rangers who deployed Nature Guardians, allowing them to remotely monitor activities in the rainforest in real time during the COVID-19 pandemic. A total of 34 alerts were issued for illegal logging activities after the system detected the sounds of chainsaws.

An offline AudioMoth acoustic monitoring device deployed on a fruit tree on a farm in Italy

Tech4Nature

Since 2020, Huawei and IUCN have jointly implemented multiple Tech4Nature projects around the world, including pilot projects in Switzerland, Spain, China, Mexico, and Mauritius. The aim of Tech4Nature is to develop technology-based solutions for 300 protected areas to improve the efficiency of nature conservation efforts.

In Mexico's Dzilam State Reserve, Huawei and a local partner deployed 20 infrared cameras and 60 acoustic monitoring devices, covering an area of nearly 20 square kilometers. Nearly 20,000 images, 710 videos, and 170,000 audio recordings have since been collected in the area, including those of 50 endemic species including jaguars.

In China's Hainan Bawangling National Nature Reserve, a real-time monitoring solution consisting of acoustic monitoring devices, wireless connections, cloud services, and AI can accurately identify the calls of Hainan gibbons, which are listed as "critically endangered". The solution's current recognition accuracy has reached 89.2%. In the future, it will be possible to automatically identify and classify their vocalizations, opening the gateway to potentially creating a unique voiceprint for each gibbon.

In a natural park in Barcelona, we also deployed an alarm detection system consisting of cameras, GPS receivers, and a cloud platform, to help park managers improve tourism management while reducing human disturbance in breeding areas of the Bonelli's eagle.

In Switzerland and Mauritius, Huawei and its partners ran pilot projects to improve accounting on carbon sinks in a protected forest area and monitor and restore a coral reef ecosystem, respectively, using technologies like blockchain, wireless networks, and cloud.

Jaguar pawprints identified in the Dzilam State Reserve, Yucatan Peninsula, Mexico

Enabling Inclusive Health and Well-being

Huawei believes that no one should be left behind in the digital world, and that everyone should have equal access to technology and the wonderful experiences that it can bring to their lives. As the world's population ages faster than ever, we need to pay more attention to senior citizens who are struggling to integrate into the digital world. This is also an important area of focus of Huawei's TECH4ALL initiative.

Digital Literacy Training for Senior Citizens: Helping Them Navigate Digital Life

The theme of the 2022 World Telecommunication and Information Society Day was "Digital Technologies for Older Persons and Healthy Ageing". ICT companies around the world have taken on the task to improve digital inclusion and fulfill their social responsibilities by helping senior citizens integrate into and benefit from the digital world.

Huawei has leveraged its own ICT expertise to support an initiative launched by the Beijing University for Seniors that provides digital literacy training to senior citizens. This program offers both online and offline courses teaching senior citizens how to use basic smartphone functions and 10 other related subjects, including shopping online and guarding against online fraud.

Since its launch two years ago, the initiative has been rolled out in multiple branches of Beijing University for Seniors as well as dozens of community centers and nursing homes. By the end of 2022, 135 training sessions had been provided, benefiting more than 12,000 senior citizens.

A lecturer teaches photography techniques to a senior citizen

Driving Inclusive Digital Development

Traditional banking and financial services are expensive and require in-person support, making them out of reach for more than 1.7 billion adults across the globe. In 2005, the United Nations called upon organizations around the world to improve financial inclusion and ensure that responsible and sustainable financial services are available for all, especially those in rural and other impoverished areas who are often neglected by traditional financial services.

Huawei's Mobile Money Solution: Advancing Financial Inclusion for All

Huawei is committed to working with its global partners to promote financial inclusion and improve lives by bringing equal, effective, comprehensive, and convenient digital financial products and services to every person and organization.

The Huawei Mobile Money solution is one part of our efforts to bridge the digital divide through mobile communications technologies and digital payment platforms. This solution aims to give unbanked people access to affordable and reliable financial services such as online deposits and withdrawals, mobile payments, remittance, loans, insurance, and savings management. These services are particularly impactful for low-income and remote communities that lack access to traditional financial services. The Huawei Mobile Money solution is also geared towards empowering micro-, small-, and medium-sized enterprises.

By the end of 2022, Huawei had provided inclusive financial services to more than 400 million people in over 20 developing countries, such as Kenya, Ethiopia, Bangladesh, Pakistan, and Tanzania.

Mobile payment makes Kenyans' lives more convenient

Security and Trustworthiness

As the world grows more interconnected, digital, and intelligent, cyberspace is becoming an integral part of life, business, and the economy. While digital technologies like cloud computing, big data, AI, and 5G are creating unprecedented new value for society, the world is also growing increasingly vulnerable. As digital assets increase, attack surfaces are continuing to expand, security vulnerabilities are being exploited more frequently, and cyberspace as a whole is becoming increasingly unsecure. These are making cyber security assurance more important than ever.

We must continuously improve cyber security and network stability to safeguard the development of our digital economy, which entails both challenges and opportunities. That means building digital trust and making critical infrastructure both more secure and more resilient. That means guiding enterprises through the digital transformation process. That means implementing management and technical measures to control risks, ensuring compliance, and protecting both networks and data. That also means giving people access to stable ICT services during major incidents like natural disasters and pandemics.

Cyber Security and Privacy Protection

Huawei has continued to make cyber security and privacy protection a top priority. We are committed to confronting cyber security and privacy challenges and seizing related opportunities through management transformation, technological innovation, and open collaboration. We are committed to fostering a better life for all in the future digital world where personal data is lawfully used and always protected by offering secure and trustworthy products, solutions, and services.

Openness and Transparency

Cyber security and privacy protection are a shared responsibility, and all stakeholders need to tackle this global challenge together. We are committed to strengthening communication and collaboration with all stakeholders and promoting common security standards, technological innovation, security governance, testing, and verification. We look forward to ongoing collaboration with all stakeholders to build cyber security and privacy protection capabilities, share value, and embrace both challenges and opportunities.

(For further information, see the Cyber Security and Privacy Protection section on pages 79 to 83 of this report.)

Supporting Stable Communications

In the information age, communications technologies do more than just enrich our day-to-day lives. They have proven vital in times of need, supporting all sorts of important occasions like disaster relief, pandemic responses, and major events. As an ICT infrastructure provider, Huawei's primary responsibility is to support stable operations and services of customer networks, giving people access to ICT services anytime and anywhere.

In 2022, more than 5,000 of our professional engineers worked side by side with customers around the clock to safeguard global communications networks and provide support during over 300 major events and emergencies.

Network Support During the FIFA World Cup Qatar 2022

During the 22nd FIFA World Cup held in Qatar, Huawei partnered with local carriers to support wireless communications in all eight stadiums and deployed end-to-end solutions at seven. This high-profile event lasted 28 days, included 64 matches, and attracted more than 1.4 million tourists. Ensuring every corner of Doha had 5G coverage and building the world's first 8K live broadcast system was a massive undertaking.

To ensure stable network operations with zero interruptions, zero accidents, and superior user experience, Huawei's project team spent over 400 days to prepare for the event. Advanced technologies such as AR-assisted operations and maintenance and large digital screens were used to help our partners deliver a superior experience for nearly three million cumulative visitors in the stadiums and billions of streamers watching the matches live online. During the event, network throughput rose by more than 80%, with a single game generating network traffic that was up to three times that of the previous World Cup. The number of roaming subscribers watching the event also grew by 40%. All of these numbers were hitting record highs. Together with our partners, we delivered a superior network experience for audiences all over the world.

A Huawei engineer tests the signal in a stadium during the FIFA World Cup Qatar

Note: Huawei was not a supplier or sponsor of the FIFA World Cup Qatar 2022.

Restoring Communications Services During the 2022 Pakistan Floods

In August 2022, Pakistan was rocked by record-breaking floods, with the government declaring a state of emergency on August 25.

In response to this life-or-death crisis, Huawei Pakistan immediately set up an emergency support team to minimize losses caused by network interruptions. Before the floods, we had already prepared 32 contingency plans and significant stockpiles of spare parts for possible disasters. So, our team was able to get key spare parts to affected sites within 12 hours and help our customers restore backbone networks within 36 hours. They stayed at the customer's network management center and core equipment room around the clock for three consecutive weeks to provide support. Our team, alongside our customers, recovered 99% of network services. No secondary network accidents were caused by optic-fiber transmission interruptions or network signaling storms.

Huawei's emergency support team takes a boat to the disaster-affected area to restore local communications services

Business Continuity Management

Through years of sustained investment, Huawei has established a business continuity management (BCM) system for domains such as R&D, procurement, manufacturing, logistics, and global technical services. This system covers our end-to-end processes, from suppliers to Huawei and on to our customers. As part of this system, we have developed and established effective measures to drive BCM and emergency response upskilling across organizations, allowing them to manage risks that arise during their daily work. Specifically, we have built up management organizations, processes, and IT platforms, embedded key BCM elements into our product development and supply management, prepared business continuity plans and emergency management plans, and organized BCM training and drills for employees.

(For further information, see the Improving the BCM System section on pages 72 to 73 of this report.)

Environmental Protection

Green and low-carbon development is rapidly becoming a global priority. Huawei believes that digital technology will be a key enabler of nature conservation, green development, and response to environmental challenges. Digitalization and decarbonization build upon each other and can together promote green development. For years, we have followed our pledge of "Tech for a Better Planet" to proactively address climate and environmental challenges. We use innovative ICT solutions to protect our shared home by focusing 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 use managerial and technical measures to reduce the carbon footprint of our products. We also engage with our upstream and downstream partners to reduce their 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 cut carbon emissions.

Promoting renewable energy

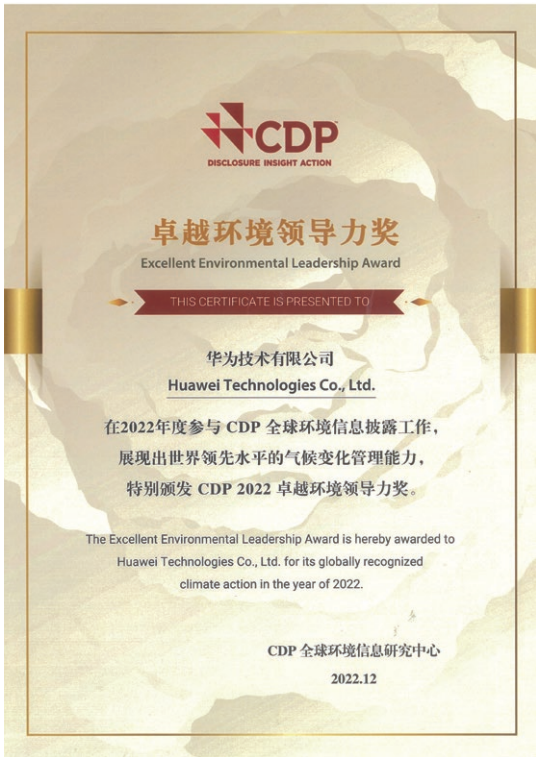
We use technologies like photovoltaics and AI to improve the efficiency of utilizing and generating electricity from renewable energy, drive the transition to renewable energy, and provide green power for the intelligent world.

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, making products more durable and easier to disassemble, and improving our product recycling program.

While actively pursuing green development during our own operations, Huawei has also envisioned green development trends for key industries by 2030 (for details, see the *Green Development 2030* report). Through these efforts, we hope to work with our industry partners to create greater business value for our customers, continuously use our innovative digital technologies to help other industries conserve energy and reduce emissions, and ultimately, contribute to global sustainable development.

In fact, Huawei's continuous efforts in environmental protection have been recognized by the environmental non-profit CDP, which placed Huawei on its 2022 "Climate A List" and also awarded our company the "Excellent Environmental Leadership Award".



Advancing Energy Conservation and Emissions Reduction

For years, Huawei has improved our products, operations, and supply chain management to support green and low-carbon development. Every department of our organization has incorporated green development goals into their strategic plans, product and business designs, and processes. In doing so, we want to minimize carbon emissions at the very source. We carefully manage our logistics carbon emissions through a visualization platform. We also use a systematic supplier management mechanism to encourage our top 100 and energy-intensive suppliers to collect statistics on carbon emissions and implement emissions reduction projects. In addition, we work closely with our partners in transportation, energy, campus, and other industries to explore how digital technology can be used to accelerate the shift toward green and low-carbon development.

Managing Logistics Carbon Emissions Through a Visualization Platform

To build a green supply chain, Huawei built a supply chain carbon calculation architecture in 2022 based on international carbon calculation standards and the logic behind its global supply network. This architecture makes carbon emissions visible throughout the global logistics and warehousing cycle. We employ a logistics carbon emissions visualization platform that supports multi-dimensional carbon emissions calculation by country, customer, and project. This platform helps our business departments dynamically predict the effects of different measures on our carbon emissions, and also helps us better measure our emissions, evaluate our carbon reduction efforts, and trace our carbon footprints.

Management model of Huawei's logistics carbon emissions visualization platform

Promoting Renewable Energy

Major economies around the world are increasingly focused on energy development strategies that reduce their dependence on fossil fuels. These strategies are also a key part of green development in the energy sector. At Huawei, we prioritize the use of renewable energy in our own operations wherever possible. In 2022, we used about 350 million kWh of electricity from renewable energy sources and 1.8 billion kWh from clean energy sources. Our campuses in Shenzhen and Chengdu are now fully powered with clean energy. Our digital power subsidiary also aims to drive an energy revolution by focusing on clean power generation, transportation electrification, and green ICT power infrastructure. By the end of 2022, our digital power solutions had helped customers generate 695.1 billion kWh of green power and save 19.5 billion kWh of electricity.

Huawei's Smart PV Solution Turns a Desert into a Horse-shaped Power Station in Inner Mongolia, China

In the Kubuqi Desert of Inner Mongolia, the State Power Investment Corporation used Huawei's smart PV solution to build a 300 MW solar power station. The power station located in Dalad Banner, an administrative region in Inner Mongolia, boasts 196,000 solar panels that were installed in the pattern of a galloping horse. By the end of 2022, the power station had produced 2.566 billion kWh of green electricity, equivalent to saving 1.027 million tons of coal equivalent and reducing carbon dioxide emissions by 2.56 million tons. The project has also fixed more than 1,000 hectares of sand.

The solar panels do far more than just generate electricity. Local residents have been able to plant herbs and shrubs under the panels and cash crops like desert false indigo and Mongolian milk vetch between the arrays. This prevents further erosion of the land between the panel arrays and contributes to wind and sand fixation and ecosystem restoration. This power station serves as a perfect example of how PV can support desertification control and plans to replicate this success are being made in other desert lands of western China.

A horse-shaped power station in Inner Mongolia that has generated 2.566 billion kWh of green power using Huawei's smart PV solution

Contributing to a Circular Economy

Huawei is committed to building a business model that incorporates circular economy practices and a closed-loop value chain. We are 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. In 2022, Huawei provided support services to upgrade more than 100 older device models to HarmonyOS 3. So far, nearly 600,000 used devices have been re-sold through our trade-in program. We also pursue green packaging for our ICT and consumer products. Last year, we reduced packaging waste by 10,256 tons (including 1,190 tons of plastic). In the past year, our ICT business disposed of 13,404 tons of e-waste, with only 0.63% going to landfills. Our consumer business disposed of 2,884 tons of e-waste, none of which went to landfills.

Recycling Discarded Devices to Reduce e-Waste

When scrapping discarded devices, we extract most of the raw materials for recycling, and also consider resource reuse during device repairs. For example, we refurbish used screens and resell them after they have passed strict tests at nearly half the price of a new one. In 2022, we added smart watch screens to our refurbished offerings at a discounted price. These initiatives provide financial incentives to consumers while cutting down waste.

We also extract and reuse raw materials from discarded devices and parts. This involves 23 processes, including deforming, scanning, sorting, magnetizing, unsoldering, tin stripping, shredding, and heavy metal extraction. By partnering with specialized suppliers, we have taken measures that mitigate the negative impact that used mobile phones have on the environment, and enable us to reuse certain plastics and metals like aluminum, copper, and steel which would otherwise end up at landfills.

Huawei reuses and recycles discarded devices, contributing to the circular economy

Healthy and Harmonious Ecosystem

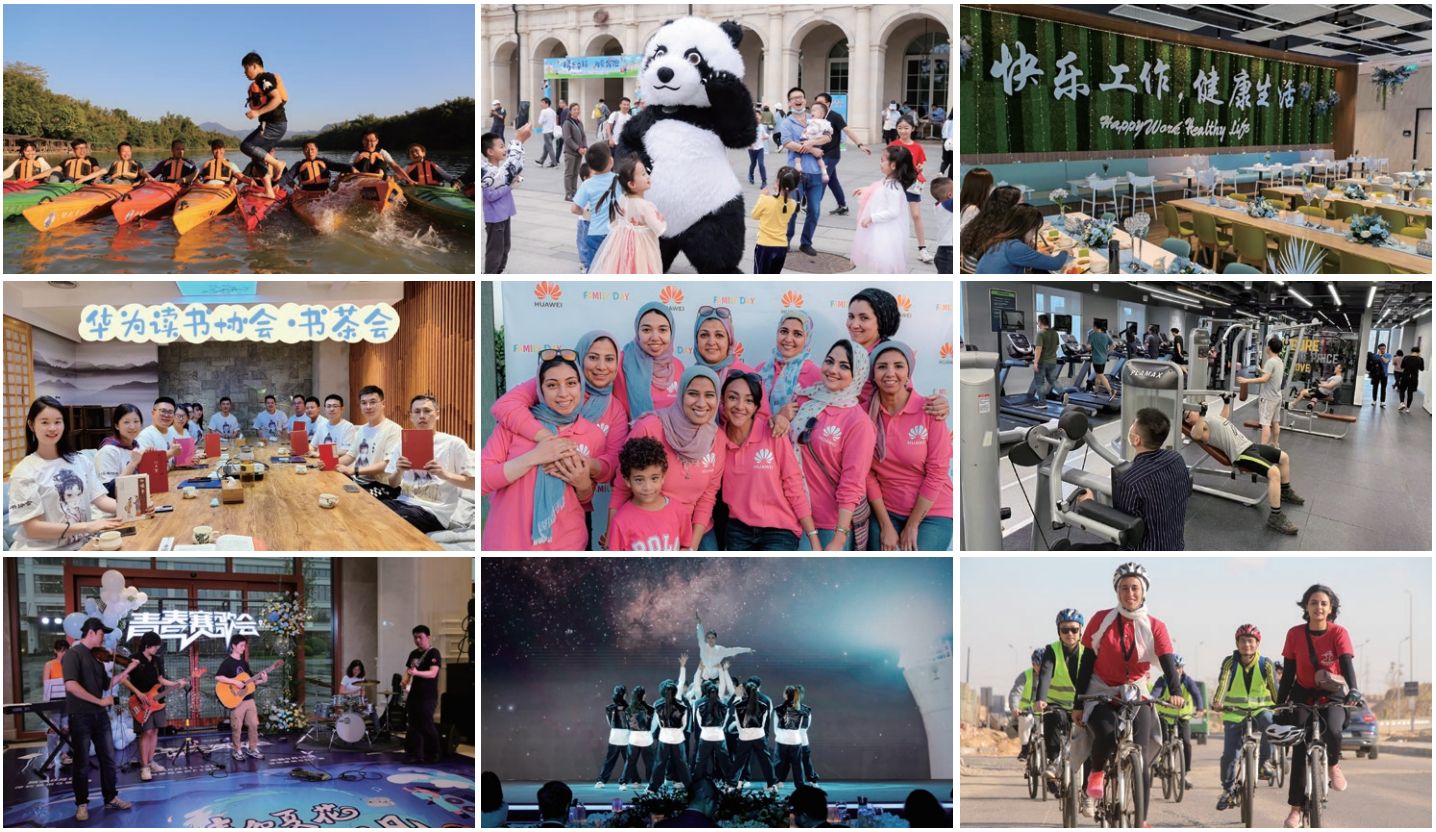
The purpose of a company is to engage all its stakeholders in shared and sustained value creation. As a responsible enterprise, Huawei remains committed to openness and collaboration for shared success. We aim to bring in outstanding global talent while also unleashing the potential of our existing teams. In addition, we work with our industry and ecosystem partners to build a healthy and harmonious business ecosystem, and ultimately bring digital to every person, home and organization for a fully connected, intelligent world.

Caring for Employees

Our dedicated employees are the company's most important asset, as it is only through them that we can create value. Huawei endeavors to take a positive, open, and diverse approach to human resources. There are no fixed rules for identifying or deploying talent at Huawei. We encourage our employees to explore uncertainties, develop a skilled localized workforce, and guide employees to keep learning through competency and qualification assessments. We are also working relentlessly to improve the working and living environments of our employees. To achieve this, we provide high-quality office, catering, leisure, and fitness services for employees, and organize different team building activities to inject vitality into the organization and improve employees' physical and mental health.

Healthy Work-Life Balance

Huawei is an advocate of a healthy work-life balance. We are committed to offering employees a safe, comfortable workplace, and improving their work and living conditions. We operate facilities like canteens, cafes, gyms, and libraries. We also provide prayer rooms on our campuses and lactation rooms for nursing mothers. These facilities help us provide quality services that meet the diverse needs of our employees. We also organize team activities around the world to create a positive organizational climate. We encourage employees with shared hobbies to form recreational communities, which include music clubs, dance clubs, reading clubs, running clubs, and photography clubs.



As an advocate of a healthy work-life balance, Huawei works to improve employees' lives through better environments and activities both on and off the clock

Business Ethics

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 guiding principle for our management team. For years, we have worked hard to build a compliance management system that aligns with industry best practices and embedded compliance management into every link of our business activities and processes. These efforts continue to this day. Huawei values and works hard to create a culture of integrity, and requires all employees to comply with its *Business Conduct Guidelines*.

(For further information, see the Regulatory Compliance section on pages 73 to 75 of this report.)

Supply Chain Responsibilities

Corporate social responsibility (CSR), or corporate sustainable development (CSD), is an important part of Huawei's procurement strategy. Our CSR management system in procurement was designed in accordance with international standards like the UN's *Guiding Principles on Business and Human Rights*, the OECD's *Due Diligence Guidance for Responsible Business Conduct*, and the *IPC-1401 Corporate Social Responsibility Management System Standard*.

Our CSR agreements signed with suppliers are prepared according to internationally recognized industry standards such as the *Responsible Business Alliance* (RBA) *Code of Conduct* and the *Joint Audit Cooperation* (JAC) *Supply Chain Sustainability Guidelines*. We require all of our suppliers to sign the agreements and cascade our requirements to their suppliers.

We have incorporated CSR requirements into all parts of our supplier management process, from supplier admission, qualification and selection to performance appraisals and portfolio management, and we work closely with customers and industry organizations to help suppliers continually improve. In 2022, Huawei continued to optimize its CSR management system in procurement, shared due diligence management information with more than 40 customers, nominated three suppliers to participate in the JAC's joint audits, and shared our audit results with customers.

In 2022, we assigned CSR risk ratings to more than 1,600 major suppliers, which represented over 90% of our procurement spending, and conducted onsite audits on 190 new suppliers and existing suppliers that posed medium or high risks. The results of these audits informed our supplier performance assessments and supplier selection decisions.

We also conducted more than 900 EHS audits on our subcontractors around the world. When we discovered problems during an audit, we helped the supplier use the CRCPE (check, root cause analysis, correct, prevent, evaluate) methodology to identify common problems and encouraged them to make improvements until the problems were resolved.

Helping Suppliers Reduce Carbon Emissions to Build a Green Supply Chain

As a leading global provider of ICT infrastructure and smart devices, Huawei understands the critical importance of sustainable development within the global supply chain. We work closely with our partners to reduce the environmental impact of enterprises' production and operation activities and facilitate this shift within our supply chain toward green and low-carbon development.

Huawei held its second Supplier Carbon Emissions Reduction Conference in May 2022 to pass on our supply chain strategies and requirements for carbon emissions reduction to suppliers. At the event, we also updated our suppliers on the status of global carbon emissions reduction, our initiatives and requirements for them, and presented awards to suppliers who had performed admirably in this regard over the last year. We invited these suppliers to share their best practices and discuss how we could further cut emissions. All suppliers attending the conference expressed their full understanding of Huawei's emissions reduction requirements and their commitment to action.

2022 Huawei Supplier Carbon Emissions Reduction Conference, where we shared our carbon emissions reduction strategies and requirements with suppliers and presented awards

By the end of 2022, all of Huawei's top 100 and energy-intensive suppliers had collected statistics on their carbon emissions and implemented emissions reduction projects. Of the top 100 suppliers, 67% already use clean energy, 13% have set science-based targets, and some have made commitments to achieve carbon neutrality ahead of 2050 – a target set by the UN. These efforts have led to a noticeable decline in the emissions intensity of Huawei's supply chain over the past few years.

Community Responsibilities

Huawei is committed to creating value for the communities where we operate. We believe communications networks have a critical role to play in connecting the unconnected and providing access to information across all boundaries. Achieving these goals will have a huge impact on socioeconomic development. As more countries and regions become increasingly interconnected, we have been working more closely with governments, customers, companies, and non-profit organizations to roll out social contribution programs. These programs aim to protect the environment, provide education opportunities, and develop skilled ICT workforces. In addition, we are committed to giving back and donating to the countries and regions in which we operate so that we grow hand in hand with local communities and drive local socioeconomic recovery.

Offline Seeds for the Future Activities Return, with Tech4Good Competition Showcasing the Innovation of Global Youth

Launched in 2008, Huawei's Seeds for the Future program takes many different forms, including intensive, short-term training, alumni reunion events that foster long-term exchanges, and the annual Tech4Good Global Competition. These projects aim to help outstanding students better understand ICT and digitalization. Seeds for the Future participants can then apply what they learn in the program to build local digital communities, while also building connections with other outstanding digital talent and future leaders from around the world to accelerate local digital transformation.

As cross-border exchanges became possible again in 2022, we brought back many offline activities for Seeds for the Future outside China. In Thailand, where the Seeds for the Future program was first launched, students from 16 Asian countries enjoyed a nine-day cross-cultural digital journey. At our Accelerator Camp in Singapore, we provided one-week advanced mentorship to the winning teams of Huawei Asia Pacific Seeds for the Future Tech4Good Competition on how to translate ideas into market-ready offerings. In Spain, European Seeds for the Future alumni spoke at the UNESCO World Higher Education Conference. In Tunisia, Seeds for the Future alumni from 20 countries attended the Alumni Reunion event, where they took part in activities like digital leadership workshops, sustainable development roundtables and cross-cultural communication. In Mexico and Greece, we held the Latin America and the Caribbean ICT Talent Summit and European Talent Summit, respectively, offering Seeds for the Future alumni a broader communication platform.

In 2022, more students participated in the second Tech4Good Global Competition and proposed innovative digital solutions that had great commercial and social value. The first, second, and third prizes were respectively awarded to the Irish team for the "Roll On" system that helps wheelchair users independently board trains, the Algerian team for their rust detection system "FarmAI", and the Italian team for "AlarmDeck", a system that tackles the alarm fatigue of healthcare staff. This competition showcases the innovation of global youth to the world.

Since the Seeds for the Future program started in 2008, Huawei has launched various education programs, including scholarships and technology competitions. In July 2021, Huawei integrated these education programs and officially launched the Seeds for the Future 2.0 program. This program aims to help professionals working in different industries, including the public sector, improve their digital skills and nurture leadership. It also organizes competitions to motivate university students. As part of the program, Huawei provides training on basic digital skills to local communities. By the end of 2022, the program reached more than 150 countries and benefited more than 2.43 million people.

Huawei's flagship CSR program Seeds for the Future is dedicated to cultivating digital talent and promoting digital transformation of local communities

Promoting Gender Equality and Cultivating Female Leadership in the Tech Industry

Huawei launched the Women in Technology initiative in 2020, through which we have initiated a number of projects in many countries, including the 27 EU member states, South Africa, Morocco, the UAE, Argentina, Brazil, Thailand, and Indonesia. With a philosophy of "Tech for Her, Tech by Her, Tech with Her", the initiative aims to use Huawei's technologies and platforms to improve women's well-being, help more women enter the tech industry, and cultivate female leadership. With this initiative, we also want to build and maintain a female-friendly environment in tech communities to improve women's representation in the tech industry.

In 2021, Huawei launched the European Leadership Academy as its flagship program for women in Europe. In 2022, two editions of the Schools for Female Leadership in the Digital Age, and a ground-breaking edition of the Women's Academy for Rural Innovation were organized, all focusing on enhancing women's leadership and strengthening their digital skills. Most of the participants were college students. For each of the schools organized by the European Leadership Academy, Huawei provided full scholarships to 29 outstanding young women, representing 27 EU member states and two EU candidate countries. We also gave them a week-long MBA-style education covering technology and leadership, as well as other core skills, such as public speaking, negotiation in a global context, and sustainability. During each edition, Huawei also invited European thought leaders, policymakers, CEOs, and industry experts to provide top-level lectures and skills training sessions for the 29 women. The topics discussed included building a sustainable and inclusive society and the importance of digital skills for global progress.

A student participating in discussions at the European Leadership Academy

Respecting Human Rights

Huawei believes that connectivity is a basic right for every human being. We are committed to building better network connectivity and providing 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 ensure that our business activities will not cause or contribute 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's *Guiding Principles on Business and Human Rights* and standards released by the International Labour Organization.

Key Areas

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 have an impact on 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 the misuse 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 in 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 or 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 480 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 for 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 the 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 in procurement in accordance with the UN's *Guiding Principles on Business and Human Rights* and the OECD's *Due Diligence Guidance for Responsible Business Conduct*. Our CSR agreements signed 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 *IPC-1401 Corporate Social Responsibility Management System Standard*. During this process, Huawei also works closely with its supply chain, 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 like 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 in 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, please see the *Huawei 2022 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
AICC	Artificial Intelligence Contact Center
AII	Alliance of Industrial Internet
aPaaS	Application Platform as a Service
ARPU	Average Revenue Per User
AZ	Availability Zone
BCGs	Business Conduct Guidelines
BCM	Business Continuity Management
BG	Business Group
BOD	Board of Directors
BU	Business Unit
CAGR	Compound Annual Growth Rate
CBS	Converged Billing Solution
CCSA	China Communications Standards Association
CEM	Customer Experience Management
CFO	Chief Financial Officer
CSR	Corporate Social Responsibility
DC	Data Center
ECC	Electronic Communications Committee
EHS	Environment, Health, and Safety
ELAA	Extremely Large Antenna Array
EMEA	Europe, the Middle East and Africa
ESG	Environmental, Social, and Governance
ESS	Energy Storage System
ETSI	European Telecommunications Standards Institute
EV	Electric Vehicle
FA	Feature Ability
FTTH	Fiber to the Home
FTTR	Fiber to the Room

Abbreviation	Full Name
FVOCI	Fair Value Through Other Comprehensive Income
FVPL	Fair Value Through Profit or Loss
GIO	Global Industry Organizations
GPO	Global Process Owner
GSMA	Global System for Mobile Communications Association
HCIE	Huawei Certified ICT Expert
HDR	High Dynamic Range
HMS	Huawei Mobile Services
ICT	Information and Communications Technology
IETF	Internet Engineering Task Force
IFRS	International Financial Reporting Standards
IoT	Internet of Things
IP	Internet Protocol
IPD	Integrated Product Development
ISO	International Organization for Standardization
ISP	Internet Service Provider
IT	Information Technology
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
IUCN	International Union for Conservation of Nature
MEC	Multi-access Edge Computing
NCIe	Network Carbon Intensity Energy
O&M	Operations and Maintenance
OECD	Organisation for Economic Co-operation and Development
ONT	Optical Network Terminal
OS	Operating System
OTN	Optical Transport Network

Abbreviation	Full Name
OTT	Over The Top
PC	Personal Computer
PLC	Power Line Communication
POB	Performance Obligation
PV	Photovoltaics
R&D	Research and Development
SDG	Sustainable Development Goal
SFP	Security Framework and Practice
SLA	Service Level Agreement

Abbreviation	Full Name
SME	Small- and Medium-sized Enterprise
SSP	Stand-alone Selling Price
UI	User Interface
UNESCO	United Nations Educational, Scientific and Cultural Organization
VR	Virtual Reality
WAN	Wide Area Network
WSIS	World Summit on the Information Society
XR	Extended Reality

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	2022	2021
Average rate	**6.7643**	6.4441
Closing rate	**6.9533**	6.3753

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