Huawei Consumer Business
Sustainability Progress Report
(2021–2022)

HUAWEI

2021–2022 **Progress**

Information Accessibility
Using technology for the benefit of all

Five-star rating

Huawei P50 Pro was given a five-star rating by China Telecom for its outstanding performance in basic capabilities, biometric recognition, AI-powered visual perception, and other aspects during the accessibility test.

Only five-star OS

HarmonyOS 2 was the only operating system (OS) to earn five stars in China Telecom's 2022 OS/UI elderly-friendliness rating.

5,000

Over 5,000 authorized experience stores in China provided training sessions related to the Bring Digital to You series of courses.

1M

Every month, around 1 million hearing impaired users experience the world in a new way, thanks to Huawei's AI subtitle feature.

Education and Health
Using technology to empower change

590,000

As of June 2022, HUAWEI EduCenter had launched more than 590,000 course sections, 36% of which are free of charge.

500,000

We have held more than 100 HUAWEI Developer Day sessions in over 80 cities across 40+ countries and regions, with our offline sessions attracting more than 40,000 participants, and online sessions garnering more than 500,000 views.

2.3M

As of August 2022, more than 2.3 million attendees had enrolled in the courses released on the HUAWEI Developers Training platform.

10,000

As of August 2022, nearly 10,000 innovative works had been submitted to the Huawei Mobile Innovation & Development Competition.

7M

HUAWEI Research has engaged 80+ partners and more than 7 million users in its innovative research projects.

ISO 13485

In September 2022, Huawei Device Co., Ltd. officially obtained the ISO 13485 certification.

Environmental Protection

Harnessing technology for a better planet

8M

We have helped extend the service life of over 8 million devices by sending faulty components, such as motherboards and screens, back to our high-level repair centers for repair.

320M

Huawei devices that come equipped with HarmonyOS had exceeded 320 million by November 2022, allowing even old devices to enjoy the benefits of cutting-edge technology.

600,000

Nearly 600,000 Huawei devices were re-sold through Huawei's trade-in program.

1,226

In 2021, we slashed the number of pages in user manuals by 80% on average, saving 1,226 metric tons of paper.

Corporate Responsibility

Repaying trust with responsibility, through technology

276

From 2021 to August 2022, a total of 276 sustainability reviews were conducted on suppliers to ensure a high-quality and responsible industry chain.

100%

All of Huawei consumer business' suppliers have obtained the QC 080000 certification. Therefore, the environmental protection risks of its supply chain are under control.

1.5M

The total training received by Huawei consumer business staff exceeded 1.5 million hours in 2021.

70,000

From 2021 to 2022, more than 70,000 poplar trees were planted to improve soil quality and create an eco-friendly oasis.

Contents

Executive Letter

He Gang

Chief Operating Officer, Huawei Consumer Business Group
Sustainable Development Committee Director,
Huawei Consumer Business Group

We have been riding through the night. Despite the challenges we face from a business perspective, we have never given up on our core aim of bringing digital to every person, home, and organization for a fully connected, intelligent world. To achieve this goal, we strive to make breakthroughs in the course of realizing sustainable development and tackle difficulties through innovation. Over the past year, we have continuously improved our sustainability management system and focused on information accessibility, education and health, environmental protection, and corporate responsibility to fulfil our social and environmental responsibilities.

Creating universal tech products

The significance of technological innovation is that it gives people equal access to the benefits that technology brings to society. To help achieve this, Huawei has iteratively built a platform to bring multiple accessibility features to more people and especially those who belong to vulnerable social groups.

We are committed to providing accessible services and improving service experiences. Such services include AI subtitle for the hearing impaired, ScreenReader for the visually impaired, as well as Simple mode and Magnification gestures for the elderly. "Accessibility" is now one of the core tenets of Huawei's products and helps us realize our vision of "digital inclusiveness".
With our continuous efforts in achieving accessibility, a Huawei smartphone ranked No. 1, with a score of 93.30 points, in the 2021 accessibility assessment of ifeng.com. Moreover, HarmonyOS 2 was the only OS rated as five stars according to the results of China Telecom's rating on smartphone OS/UI elderly-friendliness in 2022.

Adapting technologies to better serve the educational and health requirements of society

The 2030 UN Sustainable Development Goals (SDGs) highlighted the importance of education and health for individual well-being and sustainable development worldwide.

Echoing the UN SDGs, Huawei has created a comprehensive online learning environment to ensure that content directly reaches those who need it most. This helps free education from the limits of time and location, and allows us to offer learning content across a range of different channels, increasing both flexibility and accessibility. As of June 2022, HUAWEI EduCenter had launched more than 590,000 courses sessions, 36% of which are free of charge, and more than 2.3 million attendees had enrolled in the courses released on the HUAWEI Developers Training platform.

In terms of proactive digital health management, our new wearable devices enable users to monitor an array of health metrics in real time, including heart rate, sleep quality, blood pressure, and blood oxygen saturation. HUAWEI WATCH D, launched in December 2021, comes equipped with an electrocardiogram (ECG) blood pressure monitor and has been registered with China's National Medical Products Administration (NMPA) as a class II medical device. It allows users to measure their blood pressure and ECG, in order to keep track of their health.

Developing eco-friendly technology

For decades, Huawei has pledged to create "tech for a better planet", and has been committed to protecting the environment through technological innovation, reducing carbon emissions and other negative impacts on the environment, and advancing the development of the circular economy.

By designing our products to minimize dependence on dangerous substances, we have greatly contributed to the protection of our planet for future generations. Huawei products use premium and eco-friendly renewable materials, which reduces our dependence on direct mineral sources. Currently, 10 different types of renewable materials are used in our products, including paper, gold, aluminum, cobalt, and tin. Through continuous efforts in packaging and plastic usage reduction, the packaging of our flagship P50 smartphone series contains less than 1% plastics, an 89% reduction over the P40 series, making an industry-leading achievement. In 2021, the space utilization rate of our products' packaging boxes shipped from e-commerce platforms increased from 28% to 43% on average, resulting in a reduction in use of packaging materials by more than 400 metric tons a year.

We will continue to optimize and integrate the industry chain by building a "big cycle" of materials on the entire industry chain and a "small cycle" of products and components recycling, and work with our partners in the industry to build a circular ecosystem. In 2021 alone, we collected and processed over 8,600 metric tons of e-waste through the Huawei recycling system. By cooperating with industry-leading recyclers, Huawei has launched the official end-to-end second-hand device service, covering recycling, refurbishment, and resales of such devices.

Staying consumer-centric and repaying trust with responsibility

In order to place consumers' well-being at the forefront, we conduct environment, health, and safety (EHS) self-assessments and internal audits at over 5,000 stores around the world to ensure consumer safety and environmental protection. In addition, we continuously innovate and upgrade our privacy and security assurance capabilities to provide all-round privacy protection for users. HarmonyOS 3 upgrades the privacy center and security center to make the security status of phones visible at a glance and allow users to easily manage their private data.

We encourage our suppliers to adhere to a high standard of social and environmental responsibilities, including establishing a corporate social responsibility (CSR) management system, respecting and protecting employees' rights and interests, and ensuring responsible raw material procurement in the supply chain. From 2021 to August 2022, Huawei consumer business conducted a total of 276 sustainability reviews on its suppliers to ensure that its industry chain is responsible and of high quality.

Technological exploration has always been a difficult and painful process. From the breakthrough of a single technology to the construction of an ecosystem, the difficulty has increased exponentially. We must stay strategically-focused and uphold our determination and perseverance to face the many challenges that lie ahead. We aspire to develop the best possible smart devices in the world and by doing so, lead the development of the industry as a whole. More importantly, we want to deliver the best possible experience to consumers in every scenario.

In the next decade, we will continue to pursue the symbiotic and mutual development of products, consumers, nature, and society as a whole.

Information Accessibility

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Accessibility honors and awards

August 2022

- Huawei P50 Pro, which is powered by HarmonyOS 2, earned a five-star rating in this year's China Telecom smartphone accessibility assessment, due to the phone's outstanding basic capabilities, biometric recognition, AI-powered visual perception, and other traits, surpassing all other smartphone brands being assessed. The results were announced at the online launch event of the China Telecom Device Assessment Cooperation Forum.

June 2022

- The StorySign app, developed by Huawei consumer business, was touted as a noteworthy example of how AI can promote inclusive and fair education, in the "AI and education: Guidance for policy-makers" published by UNESCO.

May 2022

- HarmonyOS 2 was singled out as the only five-star-rated OS on the World Telecommunication and Information Society Day, according to the smartphone OS/UI elderly-friendliness ratings released by the China Telecom Research Institute.

April 2022

- HUAWEI Vision V Pro was certified by the China Electronics Standardization Institute as one of the first certified elderly-friendly products in China, and obtained the highest-level certification (A++).

January 2022

- Huawei P50 ranked No. 1, with a score of 93.30 points, in the annual accessibility assessment launched by the Phoenix Lab of ifeng.com.

November 2021

- Huawei's HarmonyOS-based accessibility experience optimization solution was selected as an annual success story by the China Computer Federation (CCF).

September 2021

- Huawei's innovative achievements in information accessibility were showcased at the 16th China Information Accessibility Forum.

July 2021

- Huawei nova 8 Pro, a smartphone from Huawei Device Co., Ltd. that is powered by HarmonyOS 2, received a five-star rating from the Elderly-Friendliness Assessment for Intelligent Mobile Devices, which was conducted by the China Telecommunication Technology Labs (CTTL) under the China Academy of Information and Communications Technology (CAICT).

- Huawei Mate 40 Pro+, which is powered by HarmonyOS 2, was recognized as the most elderly-friendly mobile phone among all the 12 smartphone OSs being assessed, according to China Telecom's first-ever Mobile Phone Elderly-Friendliness Guidance and Mobile Phone Elderly-Friendliness Assessment Report.

May 2021

- The "Technology leaves no one behind" program of Huawei consumer business was recognized by the China Accessibility Research Association as a "2021 excellent information accessibility case study - influential achievements".

Making technology accessible to all

Data from the World Health Organization indicates that more than one billion people are inconvenienced by physical disabilities, which means that one out of every seven people require assistance from accessibility designs. China has 17 million visually impaired people, 23 million hearing impaired people, 70 million people with dyslexia, and 150 million elderly people aged above 65. The China Accessibility Product Alliance (CAPA) was established by multiple Chinese enterprises, with the goal of helping these individuals better assimilate into society, enjoy the full benefits of the information age, and use electronic devices like ordinary people.

Huawei has long been committed to the information accessibility field, which is crucial to the company's sustainable development. We have provided a broad array of accessibility features and services that are designed for users with vision, hearing, physical, or cognitive impairments, and have brought enormous benefits to such users.

Comprehensive information accessibility, bringing technology to all

Our AI subtitle feature converts voice into text, allowing hearing impaired users to see the messages spoken by the other party. Conversely, it can also convert entered text into spoken messages, helping such users communicate with greater ease. When watching a video without subtitles, such as a live stream, the user can simply set the media sound as the source sound for the AI subtitle feature. The feature will then convert the sound into subtitles, and display the subtitles on the video. This is useful not just for the hearing impaired, but also for users who are trying to watch videos in noisy or distracting environments.

In order to help visually impaired users perceive more of their surroundings, we have developed the AI Lens feature, which recognizes and broadcasts text on objects that are photographed by the user, helping the user better distinguish the objects that they encounter.

In 2022, we released a tenth edition of the Parent's Mobile Phone Instructions and launched a series of tutorial videos to instruct elderly users on how to use their Huawei devices. To cater to the reading habits of the elderly and solve their pain points in smart device use, we have added more hand-painted illustrations to the instructions and dubbed the tutorial videos to introduce the features that are most frequently used by elderly users, as well as other features specially designed for them, like Screen Sharing and Graffiti Tagging. When elderly users encounter any challenges while using their phones, they can simply share their screen with other family members to ask for help.

Users with mobility impairments can use air gestures or wake up Celia, to remotely control their smart devices. For example, the user can tell Celia to turn on the air conditioner or adjust the light brightness at home, or even use air gestures to control their phone.

In addition to a dedicated accessibility hotline, we have also deployed full-time consultants at 75 service centers in China to provide a thorough service for our users, helping them address challenges related to both product usage and maintenance.

HarmonyOS 3, new and improved accessibility experience

In 2021, we released HarmonyOS 2 to ensure that existing accessibility features worked well on all supported devices, providing steady and premium experiences for physically-challenged users.

The latest version of HarmonyOS — HarmonyOS 3, was released in July 2022. It provides a wide range of features, such as image recognition, travel assistance, and photography assistant to enrich the lives of physically-impaired users.

HarmonyOS 3 comes with an unprecedented obstacle identification feature for visually impaired users. With this feature, the phone can detect obstacles during walks and notify the user of what the obstacle is and how far away it is, via voice broadcast and vibration reminders. The AI subtitle feature, designed for hearing impaired users, supports real-time conversion between voice and text, helping such users communicate with greater ease. Our True Wireless Stereo (TWS) earphones are able to evaluate the hearing of users on different frequency bands, and enable human voice enhancement to supplement any missing frequency bands, making them ideal for individuals who suffer from slight or mild hearing loss, such as the elderly.
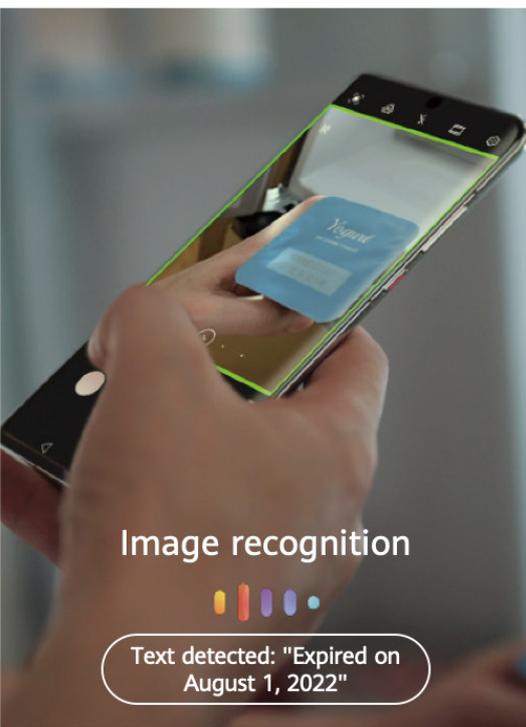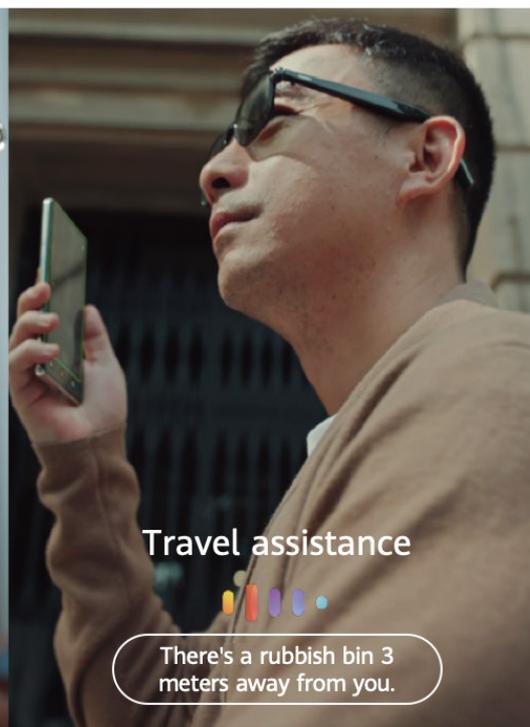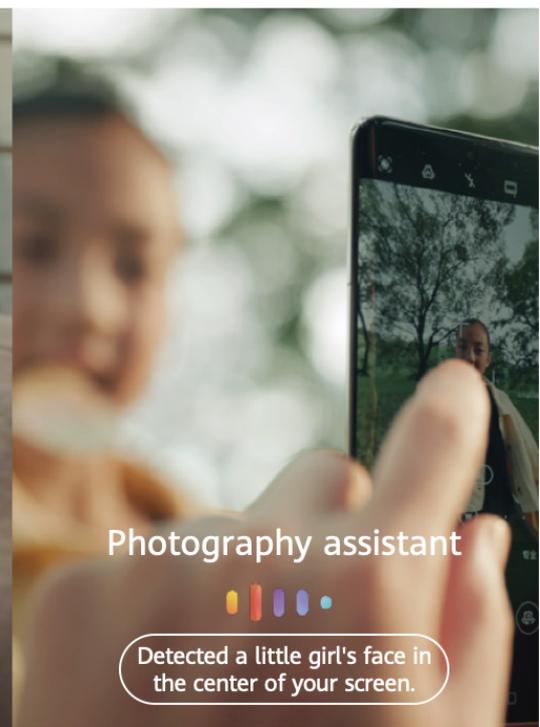
Image recognition

Text detected: "Expired on August 1, 2022"

Travel assistance

There's a rubbish bin 3 meters away from you.

Photography assistant

Detected a little girl's face in the center of your screen.

| Making information accessible

In order to make technology accessible to all, and especially to those with impairments, HarmonyOS has incorporated "accessibility" traits into its design, ever since the system's initial launch. HarmonyOS provides features like accessibility labels, focus, and gestures to keep smooth smart device use for physically-challenged users. HarmonyOS also follows an accessibility service framework and offers related interfaces for third-party developers to create accessibility features that benefit all users, particularly special social groups such as those who suffer from diseases or vision impairments.

Perceiving the beauty of the world

Cao Shengkang is a retired visually impaired sailor and travel enthusiast. Known as the contemporary Xu Xiake, a renowned travel writer in ancient China, by the media, Cao has climbed to the summit of Mount Kilimanjaro and traveled to 38 countries across five continents, depending only on a mobility cane, backpack, and pair of sunglasses.

"Everyone is a beam. When gathered, the light is able to illuminate not only others but also yourself," said Cao. He believes that although he cannot see the world, the world can still see him. Every time he reaches a mountaintop, he smells the flowers there and takes photos of the scenery to share with friends and family. Cao has been blown away by how seamlessly his Huawei phone and smart glasses work together to make his travels easier: "When I enable ScreenReader on my phone, the text is converted into audio, which is then delivered to my glasses and can be heard only by myself. This protects my privacy and avoids needlessly distracting the people around me. Even better, some simple operations can be performed on the glasses as well. I'm so excited to enjoy the remarkable convenience brought by this groundbreaking technology."

Cao Shenkang, a visually impaired user, takes photos using his Huawei phone thanks to the accessibility features.

Bringing voice into view

He Li, a young man in 20s who suffers from a hearing impairment, has been passionate about boxing since the age of 19 and dreams of one day becoming a world champion. He trains for at least four hours every day, and enables boxing mode on his Huawei watch to assist with his training regimen.

He is also a part-time takeaway rider. Relying on the AI subtitle feature on his Huawei phone to convert voice into text, he can understand what others are saying and watch live streams. AI subtitle also supports real-time voice-to-text conversion during calls, so that the hearing impaired can clearly see what the other party is saying. To reply, the user can enter text on their phone, which is automatically converted into audio and delivered to the other party, making it easy for such users to answer calls.

He Li, a hearing impaired user, uses the AI subtitle feature provided by his Huawei phone to communicate with others.

Finding lost notes via hearing

Cai Qionghui is a visually impaired piano tuner. "At the beginning, my work was questioned by many people. They thought that it was impossible for a visually impaired person to familiarize herself with the 8,800 to over 10,000 piano parts, let alone tune and repair a piano," Cai noted. But thanks to hard work and diligence, her reputation grew and many customers sought her out.

Due to her vision impairment, it is inconvenient for Cai to go out, and she needs to take her guide dog to each customer's home. Like most visually impaired users, she needs to increase the reading speed by three to five times when using the ScreenReader feature. Huawei AI Voice is enormously helpful in Cai's daily life as well. Thanks to this feature, she can perform many daily tasks on her phone, such as searching the weather, finding nearby restaurants, making calls, and sending WeChat messages.

Cai enjoys listening to music, and with the OneHop feature, she can connect her Huawei phone to her Huawei speaker with greater ease. Easy connection has become one of the most important factors for her when choosing smart devices.

The accessibility features on Huawei phones help Cai Qionghui enormously.

Dedicated experience area that demonstrates Huawei's efforts in information accessibility

At the HUAWEI DEVELOPER CONFERENCE (HDC) in October 2021, we opened up a dedicated experience area for conference attendees to try out Huawei's accessibility features for users with vision, hearing, or physical impairments in four real-world scenarios. These are: identifying objects with blurred vision, quickly finding the light switch in a dark room, operating a TV from afar without a remote control, and watching a live stream with poor hearing. These demonstrations fully immersed attendees into challenging situations that some users may find themselves in, and highlighted the importance and value of developing accessibility features.

Over the past few decades, Huawei has been committed to making technology accessible to all, especially to users with impairments. The AI subtitle feature is one such example. This feature converts voice from all types of videos, including live streams and videos without subtitles, into text that is then displayed as subtitles to users. Not only that, the conversion can be implemented even the sound is switched off during video playback, as long as the media sound is set as the source sound for the AI subtitle feature. This feature can be used in all kinds of scenarios, especially when users watch videos in a foreign language without subtitles. It not only converts voice into text, but also translates the content directly into the target language.

A visitor is shown a demonstration of the accessibility features on a Huawei phone.

Technology for all ages

Caring for the elderly

The internet and digitization have given the elderly access to a vast number of life-altering smart products and services. But even such a godsend can present its share of challenges. Emerging things such as the health code, payment code, and online car-hailing make it difficult for elderly people who lack digital skills. As sight, hearing, and tactile sense gradually deteriorate, elderly users require more attention, particularly with regard to volume, font size, responsiveness, and interface simplicity. By ignoring these areas, elderly users might find the mobile phone too difficult to use. Elderly-friendly smart devices and apps will bring great convenience to the elderly and help them better assimilate into the digital world.

To ensure that no individual of any age will be left behind in the digital era, we have optimized our products and leveraged intelligent tools to provide smart experiences for elderly users. We hope that these changes will make technology more inclusive of elderly users and help them overcome digital obstacles.

Back in 2012, we introduced a simple model to simplify mobile phone operations for the elderly. In the years that followed, we have continued to fine-tune our approach and optimize our device UI. In EMUI 11, which was released in 2020, we redesigned the system font, adjusted the spacing between home screen icons, and added some elderly-friendly features including a simplified camera UI and highlighted frequently-used features, to ensure that elderly users can see everything clearly and make key features easy to find and use.

In 2021, we officially launched HarmonyOS 2, which builds elderly-friendly enhancements into basic services, based on the Technical Requirements for Mobile Terminal Suitability for the Elderly and the Test Methods for Mobile Terminal Suitability for the Elderly, to further improve visual clarity and comfort. In addition, to help elderly users hear clearly during calls, we also set the default system volume to a high volume level.

In April 2022, HarmonyOS 2 released the Senior mode for elderly users with poor vision or hearing and those who are unable to touch the device screen precisely. Upon release, this mode becomes popular among elderly users because operations on Huawei smart devices are easier. This mode was upgraded to version 2.0 in October 2022 following the release of HarmonyOS 3, and optimized its auditory, visual, touch, security, and other experiences in order to better assist elderly users in using digital devices.

- Display magnification: The previous three large font sizes are replaced by seven font sizes, including standard, medium, large, and extra large, for even greater variety.

- Senior mode in apps: To simplify Huawei devices for elderly users, Senior mode can be automatically enabled for third-party apps that are compatible with Huawei devices, so long as **Senior mode in apps** is toggled on.

- Enhanced protection: Once this feature is enabled, only apps that pass the security check of HUAWEI AppGallery can be installed on users' devices, while risky apps or apps with viruses are prohibited from running. This aims to protect users' devices.

- Feature description and device operation tips: Relevant introduction and device operation tips are provided on the Senior mode page to help elderly users use smart devices more easily.

We identified the services that elderly people use most frequently, including safety, health, travel, and social, and provided tips for using smart devices and apps, including mobile phones, wearables, and smart home devices. In the first half of 2022, Huawei has organized more than 19,500 training sessions dedicated for elderly users. What Huawei has done for elderly users in the past year to improve their digital skills are as follows:

- We updated the Parent's Mobile Phone Instructions to the tenth edition and offered free brochures for users to claim in 1,900+ offline service centers in China. These instructions cover real-world scenarios to help elderly users better understand how to use their smart devices. They teach elderly users how to magnify the font size and thickness, as well as icon size to view things on their phones more clearly. Additionally, pure mode for Huawei mobile phones can help elderly users block the installation of risky apps, so that their devices are well protected.

- We developed the Bring Digital to You course, covering eight topics, including basic phone operations, phone security, health, travel, and entertainment. Users can book and take these courses in 5,000+ Huawei experience stores in China, or visit offline stores for consultation at any time. In 2021, over 3,000 training sessions about these courses were arranged during the Double Ninth Festival.

Training sessions about the Bring Digital to You series course in residential blocks

- Huawei stores in China sought support from local communities, street offices, activity centers for elderly people, nursing homes, welfare centers, and property management companies to select nearby venues for organizing smart device training for the elderly. Zhang Yimin, a Huawei experience store trainer in the Jilin Province, has given 14 training sessions for a local community during his spare time throughout 2021. Like Zhang, many trainers of Discover HUAWEI in China have devoted themselves to this work, in a bid to make digital more accessible to all, especially elderly people.

Discover HUAWEI training for elderly people in residential blocks

Building accessibility standards together

Huawei values the accessibility of its products and calls for social-wide awareness and the engagement of people from all walks of life. We have been working with developers to create practical tools that enhance accessibility using our technology and ecosystem advantages. This includes involving people with impairments in the development process to truly understand their needs and creating features that actually help.

To do this, Huawei's accessibility team invites experts and everyday users to test its products. We recruit engineers with vision impairments and invite such engineers from external industry associations, as well as Huawei fans and beta users with vision impairments to participate in the product development process on a regular basis or when needed. To ensure product accessibility for those with vision impairments, our product development team gathers the needs of these participants through multiple methods, such as through 5 days x 8 hours experience test, beta testing before products are put into commercial use, requirement discussion and surveys, and meetings regarding internal complaints.

Huawei has taken an active role in information accessibility advocacy campaigns and criteria formulation, to raise awareness of the challenges faced by those with vision impairments, hearing impaired, and elderly in the digital world. We believe that by working together we can achieve great things.

September 2022

- Held the Workshop on Accessibility of the Technical Plenary/Advisory Committee (TPAC) Meetings Week together with W3C, Alibaba, and other vendors. This workshop conveyed Huawei's Key Experience Path (KEP) and Key Experience Index (KEI) test design concepts to the industry and provided guidance on how to improve function usability based on availability.

June 2022

- Released the Survey Report on Digital Product Experience of Users with Hearing Impairment in China at the Technology Accessibility Development Conference (TADC). This report was developed by Huawei UCD Center and Shenzhen Accessibility Research Association.

March 2022

- Participated in the formulation of the General specification for child protection of mobile intelligent terminal, a Chinese national standard. Currently, the standard draft has been released to garner public opinions.

February 2022

- Released the company-wide CBG Mobile Phone and Tablet Visual Accessibility Test Specifications.

November 2021

- Participated in the formulation and release of the China Digital Inclusion User Research Report.

August 2021

- Participated in the formulation of the General Specifications for Information Accessibility of Smart Mobile Devices released by the China Electronics Standardization Association (CESA).

June 2021

- Participated in the formulation of the Technique Requirement of Mobile Terminal Suitability for Elderly Persons and Test Method of Mobile Terminal Suitability for Elderly Persons as a member of the Telecommunication Terminal Industry Forum Association (TAF).

May 2021

- Launched an accessibility hotline and in-store accessibility services.

February 2021

- Launched an accessibility zone on AppGallery.

September 2020

- Joined the CAPA and exchanged ideas with other CAPA members to promote product accessibility.

Education and Health

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590,000

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Merit Chart

TeamA ★★★
TeamB ★
TeamC ★★
TeamD ★★★★★
TeamE ★★
TeamF ★★★
TeamG ★

Education: Inspiring imagination and creativity

Education resources at your fingertips

Goal 4 of UN SDGs 2030 is to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". This UN SDG pinpoints education improvement as a priority of the world's education system, and highlights the essentiality of education equity for human well-being and sustainable development.

UN statistics show that one fifth of the world's school-age children do not have access to school. The situation in Europe is far from perfect as 43% of EU citizens lack basic digital literacy and skills. Poverty, gender, and race are main factors that lead to education inequality. The global outbreak of COVID-19 has seen reduced spending on education as well as an economic recession, which has further exacerbated education inequality. Countries around the world are facing great challenges in pursuing sustainable, fair, quality education, and the inequality division is widening even in developed countries. According to statistics from University College London, at least one fifth of public school students have no access to devices for online learning such as computers, and 71% of public school students do not attend classes online or only take one course online every day.

Education and health is one of the four strategic directions for sustainable development of Huawei consumer business. Huawei has created a comprehensive online learning environment to ensure that content directly reaches users who need it most. Freeing education from the limits of time and location and offering learning content across a range of different channels increase both flexibility and accessibility of education resources.

Building a smart education platform with abundant learning resources

HUAWEI EduCenter connects parents and our partners in the education industry, and leverages innovative software and hardware technologies to provide users with diversified learning resources and tools, efficient services, and smart learning experiences across scenarios.

By working with premium education partners and publishers in China, EduCenter has access to and integrates a myriad of high-quality and systematic education resources, including fun reading materials for preschoolers, interactive picture books, nursery rhymes, Chinese literature and poems, as well as cartoons, covering programming, art, music, and many other fields. Learning resources for adults of all ages cover a broad range of fields such as language improvement, professional skills, internet, and communications.

Reconstructing learning tools to create a healthy environment for child development

EduCenter provides two exclusive features for children of different ages: Kids Mode and Learning Space. It also provides the Parental assistance feature to help parents create a pure learning environment for children, so that children can focus on learning and enjoy their childhood.

Kids Mode

This feature targets preschool children and provides five modules: language, art, society, health, and science. By animating the UI, it presents interesting content across the five modules to encourage child development.

Learning Space

This feature targets children of school age. A streamlined UI design provides enriching learning resources related to art, programming, music, and others to help children quickly find what they need.

Parental assistance

With this feature, parents can link their mobile phones to their children's devices and remotely set what apps their children can access and how long they can use the device for, in order to prevent such devices from interfering with children's studies. Parents can also set what content can be viewed by their children on HUAWEI Browser, AppGallery, Video, Music, Books, and EduCenter, so that only suitable content and services will be displayed. What's more, parents can set a separate password for EduCenter to prevent children from exiting the app during self-study. In this way, an independent learning space can be created on children's devices to help them focus on their learning.

EduCenter now supports synchronized learning experiences across mobile phones, tablets, HUAWEI Vision, and kids watches. In the future, EduCenter will continue to support multi-device collaboration and introduce innovative technologies and updated content to bring all-scenario smart education experiences to learners.

| A smart, fun way to learn

Everyday companion and safeguard for children

Using mobile phones or tablets, on one hand, makes it easier for children to study by themselves. On the other hand, it may cause children to become addicted to electronics, which will in turn worry parents. In light of this, EduCenter released the Learning Space feature in 2020 to create an immersive learning environment for children. This feature not only offers a wide range of learning resources for children, but also provides the Parental assistance feature. Through settings related to eye comfort, time management, app management, and passwords, parents can manage the learning duration and apps that children can access on their devices, so that children are not distracted by external influences.

To cater to children of different ages, EduCenter launched Kids Mode for pre-school children in early 2022 and retained the previous Learning Space feature for children of school age.

The Kids Mode UI is themed around space travel and uses planetary elements to categorize and present learning resources such as picture books, cartoons, and songs. These fun scenario-based designs and vivid background sound effects liven up the study experience and present content in a more engaging manner for children of this age range. Compared with earlier versions, the Learning Space UI underwent further optimization that simplified its design. It added modules such as programming, art, and music for extensive learning, as well as learning tools such as personalized learning, course schedule, and Chinese and English dictionaries, helping children with their own self-study. Along with this, the Parent assistance feature was also upgraded. In addition to its existing functions, remote management settings were added to help parents manage how their children use the devices and keep track of their learning progress even if they are not around.
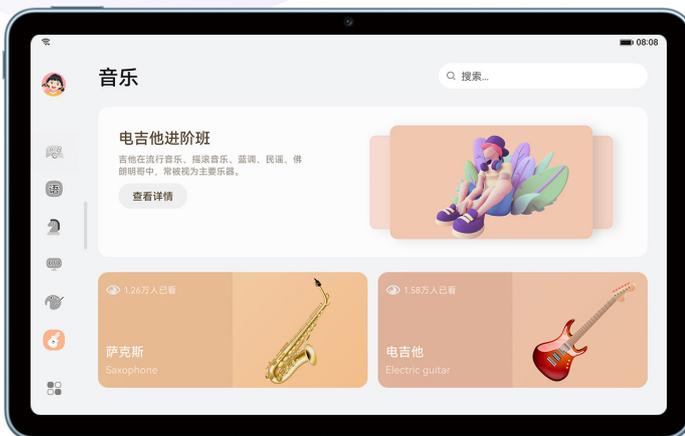
Learning Space

Kids Mode

* The above features may vary depending on device model and version.

Fostering growth by providing support

Personal development requires platform support. To that end, we have established the HUAWEI Developers platform with the goal of nurturing an open and innovative ecosystem for shared success. Relying on its channel advantages, global platform services, and industry chain resources, HUAWEI Developers helps — in steps including development, testing, promotion, and monetization — developers innovate device-based all-scenario experiences.

HUAWEI Developers has now been deployed in over 170 countries and regions around the world, fully supporting developer operations through eight large regional centers and 15 data centers.

Offline event HUAWEI Developer Day	**Online competition** Huawei Mobile Innovation & Development Competition platform	**Community operations** HUAWEI Developers Forum	**Ecosystem support** US$1 billion Shining Star Program
A platform for in-depth exchange between developers, bringing them the latest industry news, trends, and practices through topical discussions, analysis of popular technologies, and success story sharing by industry leaders.	A platform providing a series of competitions for developers to create innovative apps or products based on Huawei's cutting-edge open capabilities and services, helping developers achieve global success with various promotion channels, bonuses, global platform resources, and others.	A platform that supports developers in exploring development methods, sharing their experiences, learning about industry trends, and solving problems, as well as getting the chance to meet world-class technical experts and participate in a range of activities.	A program based on US$1 billion incentives, aiming to encourage global developers to innovate and build a seamless and smart digital service ecosystem; and providing incentives and support for the entire lifecycle of app development, through a range of programs including Shining Star · Campus Innovation Incentives, Shining Star · Pioneering Program, and Shining Star · Spark Program.

100

Held 100+ HUAWEI Developer Day activities in 80+ cities of 40+ countries and regions worldwide, bringing in 40,000+ offline participants and over 500,000 online viewers.

40,000

Launched 16 competitions covering 170+ countries and regions with 40,000+ participants and 10,000+ innovative works as of August 2022.

390,000

As of August 2022, attracted more than 1.02 million developers, facilitated 390,000+ interactions with developers, and collected 26,000+ common troubleshooting stories.

1,000

Provided incentives for 10,000+ innovative mobile services, including those developed by 1,000+ vertical industry partners worldwide.

US$1 billion Shining Star program — Comprehensive incentives for global developers

The Shining Star program aims to provide incentives and support for the entire app development lifecycle, covering development innovation, user growth, business promotion, and digital marketing, and centering on fields such as HarmonyOS digital service innovation, HarmonyOS ecosystem co-construction, open capability access, and app go-global.

With a pool of incentives worth US$1 billion, the program aims to encourage developers from around the world to work together towards innovating and building a seamless and smart digital service ecosystem.

Shining Star • Pioneering Program

The program supports more Chinese Internet innovation partners, helping expand their global presence by promoting their apps outside China. In May 2022, the Shining Star • Pioneering Program underwent a major upgrade, providing traffic support worth US$100 million outside China as well as US$100 million Shining Star resources in China, to help developers with their global strategy.

Shining Star • Spark Program

This special incentive program motivates HUAWEI EduCenter partners who significantly help build the Huawei consumer cloud services ecosystem and provide massive or high-quality content to EduCenter, by providing them with Shining Star traffic coupons on AppGallery.

Huawei's Shining Star program has provided incentives for 10,000+ innovative mobile services, including those developed by 1,000+ vertical industry partners worldwide.

Commensalism: Shaping the future of birds with games

The natural ecosystem for birds is being threatened and the biodiversity damaged. This raises questions to how developers and technologies can contribute to bird conservation. Zhu Chenqing, a software engineering student at Soochow University, and her team developed a gaming app — Commensalism — to bring awareness in environmental protection.

Student developers code to protect the nature

Zhu Chenqing has always held a strong interest in wildlife, especially birds. In her free time, Zhu likes to go hiking in the mountains, and is a keen photographer, and has taken many photos of natural landscapes. Being closer to nature makes her think about our relationship with the environment. After a news report on bird injuries in nature reserves, she and her several classmates who happened to share the same ambition decided to build a fun and engaging puzzle game that educates users on birds. With this, the idea for the Commensalism app was born.

"We always wanted to build a game but would not think of a perfect idea. But now, we're ready," said Zhu.

Commensalism is designed to help users think more about how humans and birds coexist. It is a gaming app where the user plays as a bird conservationist, who needs to perform tasks, such as birds-watching, promoting knowledge about birds, reporting on birds' current status, and visiting bird shelters, to increase their credits and thrive the bird habitats. The game gives educational content about birds, helps users think of strategies to improve the environment, and demonstrates how human activity impacts the natural habitat.

The app is designed to help users learn, asking questions such as: What is the ancestor of goose? How many mice can an owl eat in a year? The answers to these questions, and more, can be found on Commensalism.

HUAWEI Student Developers: Opening a new world of possibilities

Independently developing an app for the first time was a big challenge for the students. The team set up their development on a minor platform, and soon ran into problems when integrating the capabilities of HMS Core. What's worse, the Internet didn't have the solutions to these problems. Fortunately, they were not alone. The HUAWEI Student Developers program gives the team access to the HMS ecosystem, offering online and offline technical salons and selected courses, allowing the team to discuss technologies and share experience with other student developers. The program gives a one-stop platform for the latest solutions and knowledge that can push the app to the next level.

Zhu noted how the Huawei technical support team showed great patience and support to guide the team to the high-quality, open capabilities of HMS. Commensalism integrated multiple capabilities of the HMS ecosystem to facilitate key in-game functions, such as triggering different activities based on the user's location.

The student team innovated for half a year, and despite missing different deadlines, the first version of Commensalism was released on AppGallery. In fact, when the first version was launched, the team had already started to plan for the next version. They aimed to integrate more HMS capabilities and popular technologies, such as AR-powered tech, to deliver lifelike, immersive experience. What's more, the team planned to use computer vision tech to achieve bird identification by category.

"If we run into any technical issues, we know that Huawei's technical support team will be there anytime to resolve the problems. This is a freeing experience — now, our minds are open to new possibilities, without the worry of failing." Zhu and her team are confident about future releases, and hope their user base will take a proactive step in bird protection in the future.

Huawei Mobile Innovation & Development Competition: Exploring the smart digital era with developers

The Huawei Mobile Innovation & Development Competition consists of two contests — Huawei Global App Innovation Contest ("Apps UP" for short) and GLOBAL AI CHALLENGE. Apps UP and GLOBAL AI CHALLENGE have been open to submissions since they were launched on June 24, 2022 and intend to stimulate developers to explore new all-scenario smart experiences.

Apps UP was established in 2020 and entered its third consecutive year in 2022, attracting nearly 10,000 global developers as contestants and nearly 10,000 innovative apps. It has growing appeal to global developers. Themed "Together We Innovate", this year's Apps UP continued to set aside fantastic rewards, to boost the innovative experience of developers, and to create excellent social value. Launched on the same day as Apps UP, GLOBAL AI CHALLENGE aims to aspire global campus talent to explore new AI frontiers. The contest was in its fourth year, and involved over 500 universities spread across over 45 countries and regions. The GLOBAL AI CHALLENGE is establishing itself as a major campus event in the global AI field, gathering scholars and student algorithm elites to explore the future, overcome difficulties and challenges when creating innovations for the digital world, contribute to industry development, and make breakthroughs in the AI field.

AppGallery Connect

AppGallery Connect provides mobile app developers with one-stop full-lifecycle services covering idea conception, development, distribution, operations, and analysis, helping developers improve development and operations efficiency, expand user base, and gain more revenue. In addition, AppGallery Connect is a platform to launch HarmonyOS apps and atomic services, which are distributed and operated efficiently with a rich array of services provided by AppGallery Connect.

As of August 31, 2022, AppGallery Connect had opened 123 services to developers in the Chinese mainland and 86 for other regions, connecting developers in more than 170 countries and regions with hundreds of millions of users.

Gathering developers and inspiring innovations for a win-win ecosystem

HUAWEI Developer Groups (HDG) is a non-profit community that fosters in-depth technological exchange among global developers. The platform has launched more than 120 activities, including those related to HarmonyOS, AppGallery Connect, HarmonyOS Connect, HMS Core, app distribution, service distribution, content distribution, as well as promotion and paid advertising, in 68 cities with 138 organizers.

HUAWEI Developer Experts (HDE) is a program that recognizes individuals who demonstrate expertise in one or more Huawei open capabilities, and are passionate about helping developers improve their skills. HDE strives to nurture talented developers that work together to build a global developer ecosystem. To date, Huawei has certified 59 HDE evangelists.

HUAWEI Student Developers (HSD) aims to inspire student developers to learn more about cutting-edge technologies, sharpen their skills, and explore new opportunities. By the end of August 2022, HSD had carried out over 300 activities, including technical salons, course training, coding practices, and campus competitions at more than 400 universities and colleges, involving over 300 campus ambassadors.

HUAWEI Women Developers (HWD) is a global program that Huawei launched with the purpose of supporting women developers. The program aims to empower women developers, provide them with comprehensive resource support, and give them the space for developing their career and technology. HWD is also a platform where women developers can learn, exchange ideas, and shine.
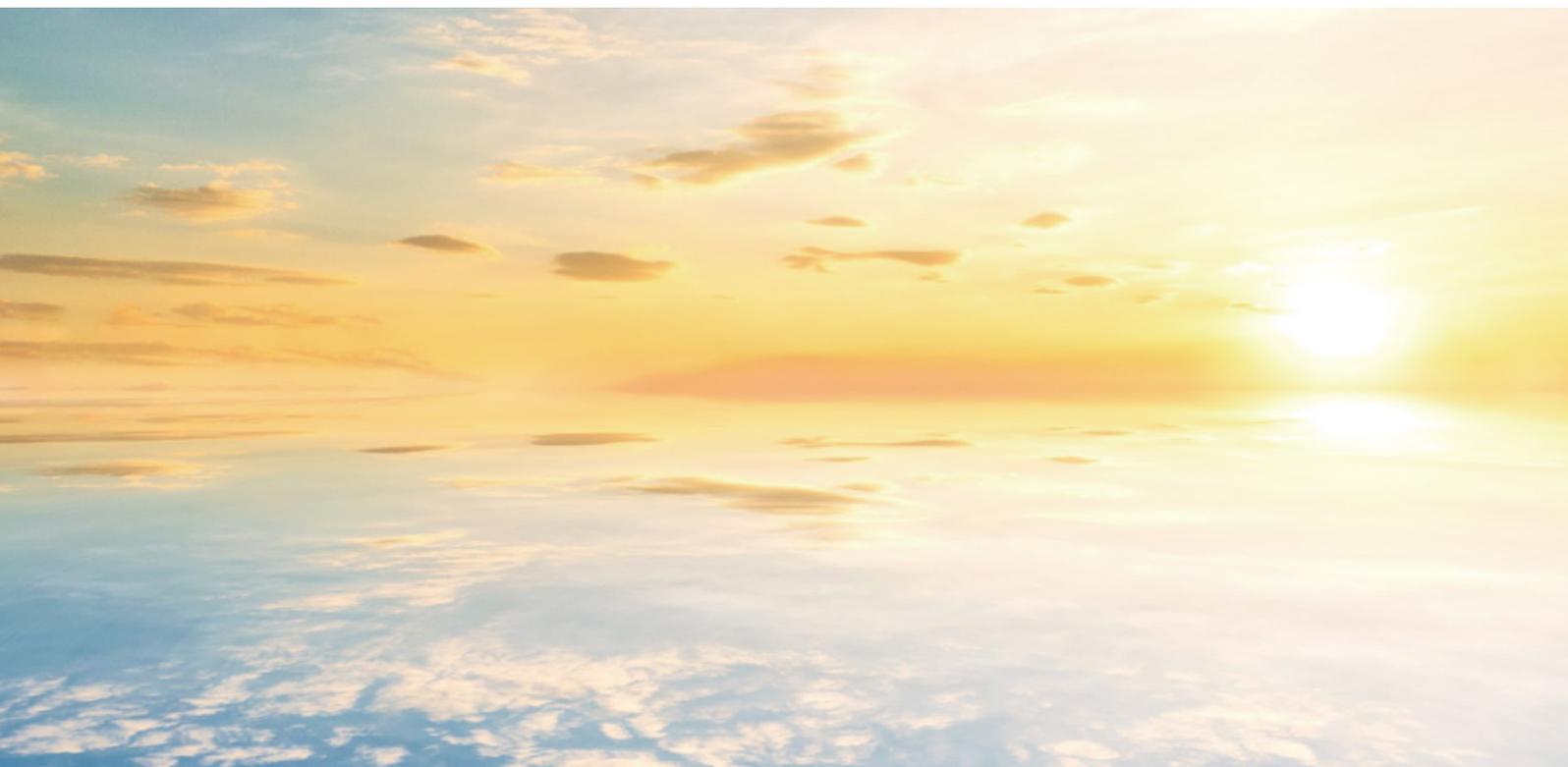
HUAWEI Developers ecosystem market

HUAWEI Developers ecosystem market is a one-stop platform for the transaction of software and hardware products and services in the Huawei ecosystem, with popular product zones such as app development, marketing and operations, smart hardware, expert services, and general software. It connects software and hardware service providers and developers to streamline app development, release, and operations, and integrates industry chain resources for service development of developers and enterprises.

HUAWEI Developers Training

HUAWEI Developers Training offers MOOC, micro-lectures, and training camps covering entry, primary, and advanced content on HarmonyOS, HMS Core, and mainstream technical topics. It acts as a one-stop learning, practice, assessment, and certification platform for developers to cover different learning requirements, enabling developers in an all-round manner, and building the developer ecosystem. More than 1,700 courses have been brought online to over 2.3 million attendees.

1,700+
HMS/HarmonyOS courses

130+
lecturers

21,000+
certified trainees

2.3M+
attendees

HUAWEI Certificate Program
covering HMS, HarmonyOS, etc.

Learning

Practice

Assessment

Certification
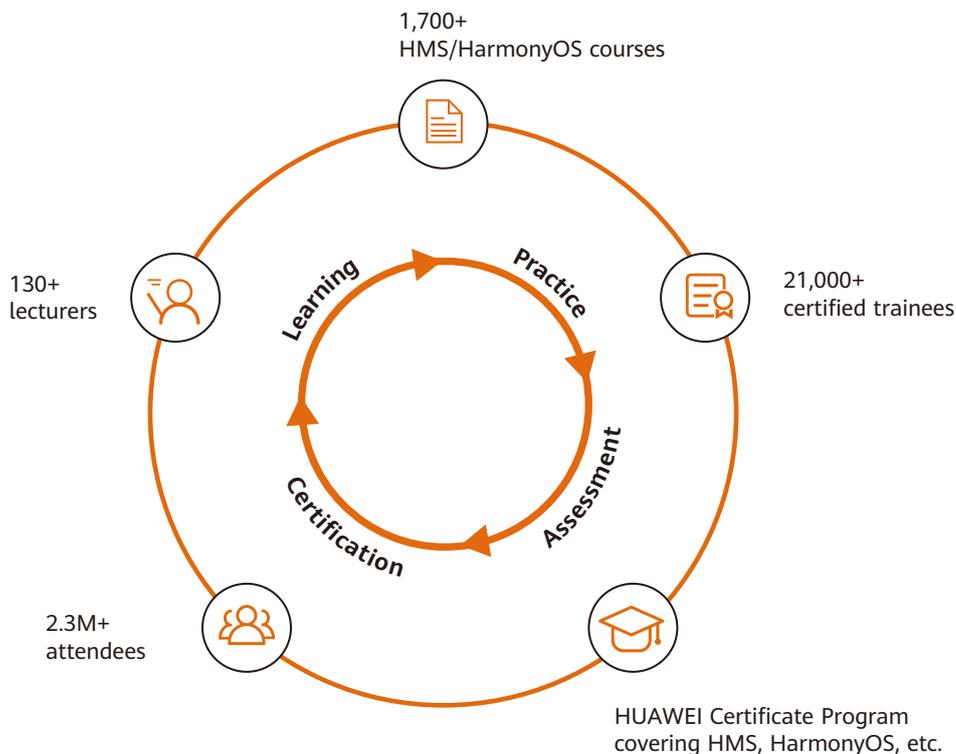
Health: Technological innovation boosts active health

Competitive hardware, software, and services — Building a unique health management experience

As global digitalization picks up speed, the fitness and healthcare industries are unprecedentedly embracing digital technologies because of many co-acting factors, including policies, technological upgrades, market evolution, and the pandemic. There have been attempts to utilize data from health monitoring to drive the digitalization and visualization of the human body, for greater active health management. However, many challenges still lie ahead in the ongoing exploration of the digital health solution. In this context, wearables, which are durable, portable, mobile, easy-to-carry, and ready-to-use, are proving to be more than sufficient for personal health management.

Huawei's fitness & health services always put consumers first, and are innovating these services so that users can be more health-conscious, with greater vision of bringing digital health to every person, home, and industry.

Accurate vital signs through five generations of TruSeen™ over seven years

Huawei's fitness & health R&D team invests heavily in basic research and prioritizes the accuracy of data monitoring. HUAWEI TruSeen™, now in its fifth generation, is a vital sign monitoring technology developed by HUAWEI Health Lab and Huawei's global research centers over seven years. HUAWEI TruSeen™ features accurate, convenient, and fast health data monitoring, bringing consumers an increasingly rich fitness and health experience.

In 2016, TruSeen™ 1.0 only supported resting heart rate monitoring. Only one year later, TruSeen™ 2.0 added support for six types of ambulatory heart rate monitoring, as well as scientific sleep and stress tests, covering more health monitoring metrics. In 2018, as Huawei ushered in a new era of ultra-long battery lives for smart watches, TruSeen™ 3.0 realized 24-hour real-time heart rate monitoring. Then in 2019, TruSeen™ 3.5 began SpO2 monitoring, heart rate monitoring during swimming, as well as hypoxia reminders at high altitudes. TruSeen™ 4.0 in 2020 achieved medical-level precise ECG detection and periodic continuous SpO2 monitoring. Last year's TruSeen™ 5.0+ scaled new heights, bolstering its ambulatory heart rate monitoring accuracy, and bringing new capabilities for high-altitude SpO2 monitoring and medical-level blood pressure measurements.

Gradual improvement to algorithms is also attributed to the hardware breakthroughs of HUAWEI TruSeen™. In the heart rate module, the 4-channel optical ring design has been upgraded to an 8-channel version, while the built-in sensors have changed from scattered to integrated, significantly enhancing anti-interference capabilities and showcasing expert craftsmanship. Not only that, the sapphire rear cover is carefully curved to fit the wrist well, making it feel more comfortable while delivering a higher heart rate signal quality.

Advanced software and hardware brings about new healthcare technologies integrated into Huawei smart wearables. The wrist single-lead ECG collector on HUAWEI WATCH GT 2 Pro ECG version, ECG blood pressure monitor on HUAWEI WATCH D, and Huawei's ECG app have obtained the registration certificate from China's NMPA as class II medical devices, which aid the early screening of cardiovascular diseases such as atrial fibrillation, premature beats, and high blood pressure. The ECG app is now supported on smart wearables, and experts from authoritative medical institutions explain the findings of the ECG report to users, while also offering professional health guidance.
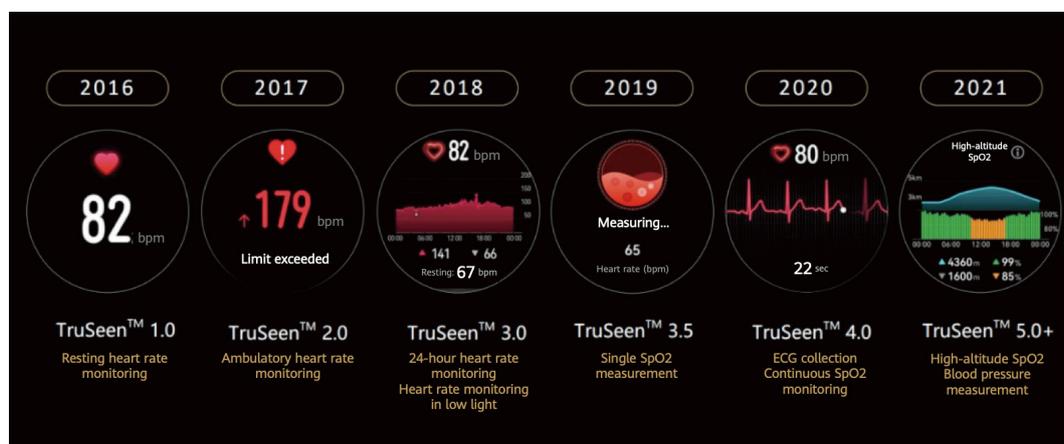
Epoch-making blood pressure watch, providing blood pressure measurements anytime, anywhere

In 2021, the ECG blood pressure monitor on HUAWEI WATCH D obtained the registration certificate from China's NMPA as a class II medical device.

After seven years of dedicated work in technologies, more than 80 patents, and over 400,000 blood pressure data records, Huawei's fitness & health algorithm research team finally made a major breakthrough in miniaturizing the conventional oscillographic blood pressure measurement technology so that it can fit into consumer electronics.

In addition, Huawei pioneered the hybrid blood pressure measurement technology, realizing straightforward real-time blood pressure monitoring. The blood pressure exhibits a relatively obvious circadian rhythm, which sees the blood pressure dip at night during sleep, and then undergo a steep increase in the morning (the period from sleeping to waking up). The circadian rhythm can be affected by the changes in living habits, working overtime, and poor sleep quality.

Mental state, environment, diet, and other factors can all lead to changes in blood pressure. Some patients experience so-called white coat hypertension, which means that their blood pressure readings are higher when measured at the hospital. On the flip side, some patients may have a normal blood pressure in the clinic, but an elevated blood pressure at home, which is called masked hypertension. Masked hypertension confers a higher risk of cardiovascular diseases. Therefore, continuous blood pressure monitoring is necessary.

With the innovative hybrid blood pressure measurement technology that combines the micro-pump with PPG, HUAWEI WATCH D can provide precise blood pressure measurements anytime and anywhere. Moreover, the watch utilizes PPG to offer continuous, cuff-less monitoring for blood pressure trends, so that users can keep up to date with changes to their blood pressure in real time.

Huawei Health, offering rich and professional health services

The Guardian service of Huawei Health launched in 2021 is an innovative technology of active health management. The service is provided by Huawei Health together with Ping An Health, offering online professional health services for Huawei wearable users, including private doctor service, consultations with specialists from top hospitals, medical appointment service, and HUAWEI Health+ benefits. With the Huawei Health app, users can consult specialists from top hospitals at home, one on one, and get professional medical advice. Users can also enjoy comprehensive health management services. Personalized blood pressure health management plans, covering exercise, diet, sleep, and weight, are formulated based on users' health data.

Health community in the **Health** module on Huawei Health allows users to track their parents' sleep quality, workout status, heart rate, blood pressure, and other health data at any time, after obtaining their parents' consent. Regardless of the distance, as long as a user's family members and friends join the user's Health community, their fitness and health data will be shared with the user. If any abnormal data is detected, the user will quickly receive notifications. What's more, the user can set task reminders and health supervision to protect the health of their beloved.

Beyond physical health, mental health and a good and healthy lifestyle are also important. Huawei Health collaborates with the Chinese Preventive Medicine Association to present Health Clovers, which encourages users to complete workout, sleep, and emotion management tasks every day, such as drinking water, getting up regularly, breathing training, sleeping early, walking, moderate to high intensity activities, and smiling. This visualizes how users cultivate good health habits and improve their health.

Innovative technologies for privacy security

Huawei firmly believes that privacy is a fundamental right of consumers, and is committed to creating innovations that protect user privacy. No one should be able to access users' data without their consent, meaning users should always have control over their data. Huawei's fitness & health services have developed strict privacy and security principles and opened security and privacy capabilities to ecosystem partners, to ensure the compliance with privacy and security principles in data collection, authorization, transfer, and storage, thereby reassuring consumers.

HUAWEI Research: Focusing on public health and accelerating innovation

A focal point of the Healthy China 2030 initiative is the shift from disease treatment to disease prevention. Digital technologies have laid the ground for digital health, which is gradually become an integral part of people's daily lives, providing more autonomous, real-time, and interactive health services to help people manage their health more proactively, get on the track to a healthier lifestyle, and enjoy a better life. In 2018, Huawei launched HUAWEI Research to help partners carry out innovative research while protecting consumer privacy. HUAWEI Research opens the framework of the Research app and multiple sensor capabilities of Huawei smart devices, so that researchers can easily recruit a large number of participants and obtain valuable real-world data. The AI-based big data analysis capabilities that are open to researchers significantly improve research efficiency, accelerating the development of innovative apps and solutions.

HUAWEI Research cooperates with more than 80 research institutes, such as 301 Hospital, China International Exchange and Promotive Association for Medical and Health Care, Tongji Hospital Affiliated to Tongji Medical College of Huazhong University of Science and Technology (HUST), Medical Group of Division of Infectious Diseases in Shulan Hospital, and West China Hospital of Sichuan University, in fields covering cardiovascular health, sleep health, respiratory health, liver health, and others, to drive breakthroughs in active health research.

HUAWEI Research has passionately helped nurture the development of innovative technologies, and has worked with more than 80 partners and helped conduct research covering more than 7 million users. As more and more partners join HUAWEI Research, it is getting closer to transferring its research into practical digital health, one step at a time. It also passionately seeks to integrate industries, schools, research centers, and hospitals to accelerate research and innovation in the fields of exercise, circulation, respiration, nerves, endocrine, digestion, and more, to promote all-round health, and provide chronic disease risk prevention and control services.

| Research ecosystem partners | Hospitals | Universities | Research centers | Societies/Associations |

Heart health
301 Hospital — heart health research

301 Hospital has developed the Heart Health Research app based on the HUAWEI Research platform. This app can work with Huawei smart wearables that are equipped with a high-performance heart rate sensor, to screen, prevent, and manage arrhythmia risks for a large number of people, effectively handle missed diagnosis of atrial fibrillation, premature beats, and other types of arrhythmia, as well as other diagnosis dilemmas. Furthermore, AI technologies are used to predict atrial fibrillation risks and reduce the probability of adverse events such as cerebral stroke.

Sleep health
301 Hospital — sleep apnea research

Based on the HUAWEI Research platform, 301 Hospital initiated sleep apnea research. With the high-performing heart rate sensor and SpO2 sensor of Huawei wearables, the research has simplified the screening of sleep apnea risks at home. Users are given personalized guidance and intervention solutions based on the severity of the sleep apnea risk.

Vascular health
China International Exchange and Promotive Association for Medical and Health Care — vascular health research

The Vascular Health Research app is developed based on the HUAWEI Research platform and can work with Huawei wearables that are equipped with the high-performing heart rate sensor and ECG sensor, to provide users with arteriosclerosis risk screening and professional health guidance, helping them manage their vascular health at home and lead a healthier life.

Respiratory health
301 Hospital and Tongji Hospital Affiliated to Tongji Medical College of HUST — respiratory health research

The research was carried out based on the HUAWEI Research platform. It enables Huawei wearables to record the physiological parameters and cough severity of users in real time, and intelligently screen lung infection risks through the multi-modal fusion model. Medical experts will then advise high-risk users quickly see a doctor, realizing active management of respiratory health at home.

Blood pressure health
China International Exchange and Promotive Association for Medical and Health Care — blood pressure health research

The research was carried out based on the HUAWEI Research platform. With a HUAWEI WATCH D that is equipped with an ECG blood pressure monitor, the research enables cuff-less blood pressure monitoring and ambulatory blood pressure monitoring in daily life, helping users screen masked hypertension and manage their blood pressure.

High-altitude health
West China Hospital of Sichuan University — high-altitude health research

The research was carried out based on the HUAWEI Research platform. With the high-performing heart rate sensor, SpO2 sensor, and barometer of Huawei wearables, the research enables proactive screening and monitoring of the altitude sickness risk, letting users keep on top of their health in high-altitude locations.

Liver health
Medical Group of Division of Infectious Diseases in Shulan Hospital — liver fat research

The research was initiated based on the HUAWEI Research platform. It enables liver fat level detection at home with Huawei smart scales, and users will receive professional health advice to prevent and handle fatty liver disease at an early stage.

| Innovating for the health of all

Huawei passionately works with industry partners to create healthcare services for all.

TrackAI enables early diagnosis and treatment for children with visual impairments

Pediatrics has always been called a "dumb department" because babies usually cannot tell their discomfort accurately to doctors. Congenital blindness is a particularly difficult disease in pediatrics. Congenital or progressive low vision of children is difficult to detect because children can already be accustomed to it. However, here is a striking fact: most children with visual impairments can have a normal vision if their problem has been detected early enough.

So, how can we tell whether a baby is able to see properly or not? Currently, only highly experienced ophthalmologists can assess the visual capabilities of very young children. To tackle a lack of highly experienced doctors and difficulty in diagnosing eye diseases in children, DIVE Medical in Spain, in cooperation with Huawei, launched the TrackAI project, which aims to create an easy-to-use and portable device that can quickly identify children with visual impairments. The device uses eye-tracking technology to detect a child's gaze data, and integrates Huawei's AI capabilities to analyze their vision. After just three years, this project has helped more than 4,700 children from five countries test their vision.

In 2022, TrackAI has set its sights on expanding its presence to cover more countries across Europe, Africa, and Latin America, such as France and South Africa, and is expected to help over 2,000 children. Meanwhile, the new HUAWEI P50 smartphone and MateBook E are being used to update the software and device with the aim of further improving the accuracy of this technology.

Building a quality management system for medical devices, and creating premium wearables

As people demand more practical, health-related functions of smart wearables, Huawei Device Co., Ltd. has started to build a medical system since 2019, and has registered and certified related medical products to ensure that wearables with medical functions fulfill international and Chinese quality management requirements for medical devices. It also ensures that the full lifecycle of medical products, covering design and development, production, storage, sales, after-sales service, as well as adverse event monitoring and product recall, complies with the requirements of the medical device quality management system.

Currently, Huawei has established a medical device quality management system based on the EU Medical Device Regulation (MDR), ISO 13485, Good Manufacturing Practice for Medical Devices (GMP), and other laws and standards, and incorporated core requirements of the system into Huawei's business processes, in a bid to ensure that product quality, security, and effectiveness. In September 2022, Huawei Device Co., Ltd. officially obtained the ISO 13485 certification.

By September 2022, Huawei Device Co., Ltd. had obtained registration certificates from China's NMPA for the wrist single-lead ECG collector on GT 2 Pro ECG version, wrist single-lead ECG collector on GT 3 Pro ECG version, wrist blood pressure monitor on WATCH D, and ECG app, of which the latter two have obtained the CE certification from the EU.

Beyond the EU, Huawei has continued to build healthcare product sales systems in countries and regions outside China since 2022, to support medical registration and certification of related products and provide premium products for consumers.

Environmental Protection

Harnessing technology for a better planet

8M

We have helped extend the service life of over 8 million devices by sending faulty components, such as motherboards and screens, back to our high-level repair centers for repair.

320M

Huawei devices that come equipped with HarmonyOS had exceeded 320 million by November 2022, allowing even old devices to enjoy the benefits of cutting-edge technology.

1,226

In 2021, we slashed the number of pages in user manuals by 80% on average, saving 1,226 metric tons of paper.

400 metric tons

Thanks to advanced packaging methods in the e-commerce sector, the consumption of packaging materials in 2021 was slashed by 400 metric tons compared with 2020.

600,000

Since 2015, nearly 600,000 Huawei devices have been re-sold through Huawei's trade-in program.

100%

Huawei uses 100% biodegradable soy ink, as opposed to conventional petroleum-based ink, on its product packaging.

We believe that technology is critical solution to environmental challenges. For decades, Huawei has pledged to create "tech for a better planet", and has been committed to protecting the environment through technological innovation, with a particular focus on carbon emissions reduction, renewable energy, and supporting a circular economy.

Reducing carbon emissions: Continually innovating our practices in every facet, from management to technology to beyond, to minimize the carbon footprint created by Huawei products; working with upstream and downstream partners to boost energy efficiency, reduce emissions, and create an end-to-end green supply chain; and leveraging innovative information and communications technology (ICT) to promote carbon emissions reduction in diverse industries.

Promoting renewable energy: Applying technologies including photovoltaics (PV) and AI to further bolster the efficiency of renewable energy; and creating a smarter and greener world that promotes renewable energy throughout industries.

Contributing to a circular economy: Using eco-friendly materials and reducing our raw material consumption, improving product durability, designing products that can be disassembled easily, and optimizing the product recycling system, to make sustainable development a reality.

Huawei consumer business prioritizes the environmental responsibility of products. Through technological innovation, we perform closed-loop management of product lifecycles, as well as sustainable production, allowing us to minimize our impact on the environment without compromising product experience for hundreds of millions of consumers.

Recycling

Design

Use

Production

Transportation
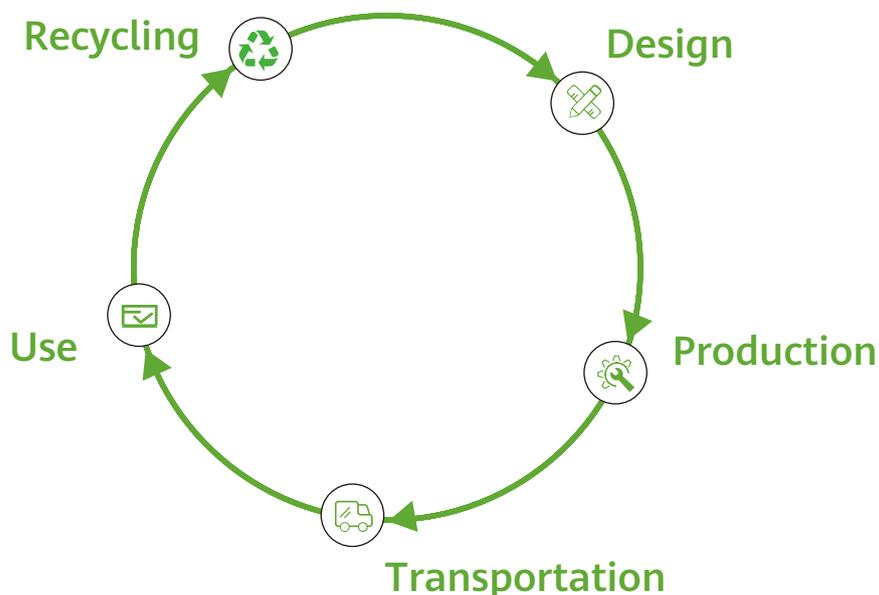
Green product design

Use of eco-friendly materials

More secure materials

Since 2016, we have implemented hazardous substance controls for our phones that go beyond those required by laws and regulations. By designing our products so that they depend less on hazardous substances, we have made great strides to protect our planet. In addition to complying with hazardous substance management laws and regulations in China and around the world, such as the China Restriction of Hazardous Substances (RoHS), as well as the RoHS Directive, and Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) from the EU, we have proactively eliminated substances that are still used in the industry, such as brominated flame retardants (BFRs), chlorinated flame retardants (CFRs), polyvinyl chloride (PVC), phthalate esters (PAEs), antimony trioxide, and beryllium and its compounds. E-waste that contains these dangerous substances is harmful to the environment and people when being recycled (for example, they release dioxins).

Not only do we manage the chemicals used in products, we have also cut back on chemicals being used throughout the manufacturing process across the entire supply chain. In 2020, we began controlling the arsenic in glass, to prevent suppliers of LCD glass and glass rear covers from using it during the manufacturing process, as arsenic may be harmful to the environment and people.

In order to improve our environmental health test and analysis capabilities for substances, we have built a state-of-the-art environmental protection lab, spanning 500 square meters and comes complete with cutting-edge equipment encompassing chromatography, spectrum, and mass spectrometry. This lab has achieved industry-leading environmental protection test and analysis capabilities, and has since been accredited by the China National Accreditation Service for Conformity Assessment (CNAS).

Renewable materials

One important measure that we have taken to protect the environment and promote the circular economy is by using premium eco-friendly renewable materials, which reduce our reliance on direct mineral sources.

Producing electronic products involves dozens of different materials, and given current constraints, it is simply not possible to find high-quality renewable alternatives for each type of material. We pledge to work diligently with our suppliers to gain a deeper understanding of and improve the supply chain for renewable materials, which will allow us to incorporate more high-quality renewable materials into product manufacturing.

Huawei currently uses over 10 different types of renewable materials, including paper, plastics, gold, aluminum, cobalt, and tin, in our products. We are also working closely with our suppliers to explore even more potential applications for high-quality renewable materials.

Eco-friendly plastics

Plastics are the hardest materials from electronic products to reuse. Therefore, it is essential that we use plastics that have the least possible impact on the environment. Since 2013, we have used bio-based plastics widely during phone production, substantially mitigating the negative environmental impact associated with the manufacturing of petroleum-based plastics. Over 30% of the bio-based plastics that we use come from castor oil, which reduces carbon dioxide emissions by 62.6%, when compared with conventional plastics.

Eco-friendly product packaging

Eco-friendly packaging design is critical for creating sustainable Huawei products. The use of small, lightweight packaging reduces raw material consumption, such as paper, protecting forests in the process. The use of eco-friendly packaging materials can effectively reduce pollution and contribute to sustainable development and protection of the ecological environment.

Huawei strives to cut down its packaging in favor of reusable and eco-friendly materials, without compromising product protection.

Small packaging for maximum space utilization

Well-designed packaging using lightweight materials is critical to achieving sustainable product packaging. By using lightweight packaging, the use of paper and other materials can be reduced, which in turn reduces energy consumption and carbon emissions during product shipment. Huawei promotes small packaging from the four aspects below to improve space utilization and reduce the weight of packaging.

From January 2021 to August 2022, Huawei reduced the packaging used for its smartphones, wearables, tablets, PCs, monitors, etc. This helped Huawei maximize its package space utilization.

Design optimization: We reduce stack designs and bonding structure. Where possible, we pack the product and data cable together in the same box for easy unpacking. By adapting this change, the package space utilization rate of HUAWEI Band 7 is 2.9% higher than that of HUAWEI Band 6.

Standard optimization: We actively improve test criteria while adhering to industry practices and preventing over-packaging. By doing so, the package space utilization rate of Huawei MateView SE is 37.2% higher than that of its predecessor.

Optimizing the dimensions of products and accessories: We have removed steel straps from watches, defined straps as an accessory, and aligned their length with that of other straps. Another example is that by using data cables folded in a looser way, we have reduced the packaging for data cables by 20%.

Reducing the quantity of packed goods: We no longer pack accessories, such as earphones, adapters, and data cables, in the box, thereby reducing the size of packaging.

Data cables folded in a compact way to cut packaging

60 x 145 x 20 mm

（20% smaller）

60 x 105 x 20 mm
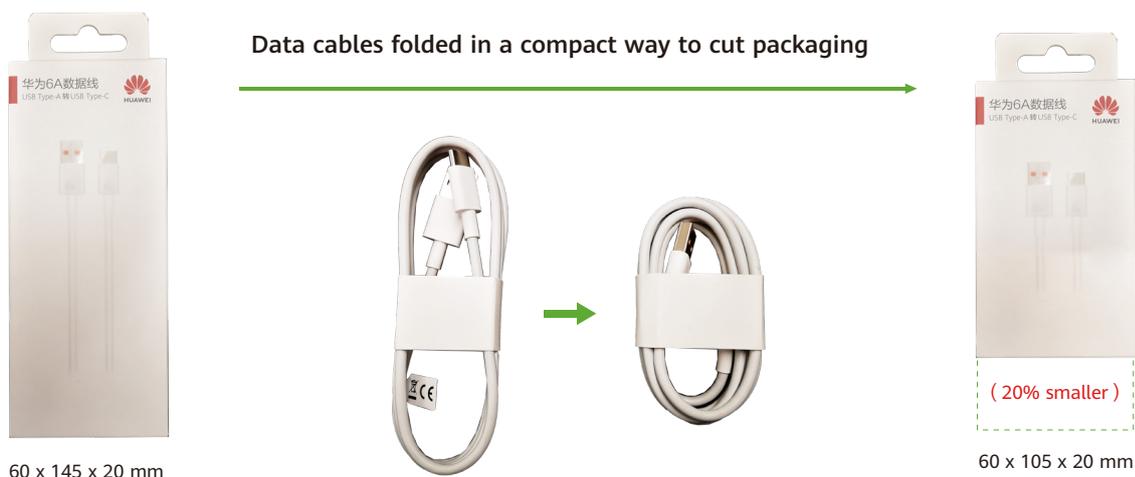
Less plastic packaging, contributing to green consumption

According to United Nations Environment Program (UNEP), an estimated 8 million metric tons of plastic enter the world's oceans every year, and plastics make up 60%–90% of the waste accumulated on coastlines, the ocean's surface, and the seabed.

To reduce plastic waste, Huawei opts to use non-plastic materials for its packaging whenever possible. The Mate 50 series, for example, uses special paper to replace the protective plastic film that protects the phones. We have also developed a kind of high-strength paper to replace plastic sealing labels for boxes. This paper will also be the first time it is used in customized product packaging for carriers. These changes are expected to reduce the use of disposable plastics by approximately 13 metric tons for every 10 million phones. Huawei's packaging designers also developed a special oil to replace the plastic film, which has been used in the packaging of the HUAWEI Enjoy 20 Pro and nova 7 SE (5G) models, and will be used for more products in the future. It is forecasted that the use of plastics in disposable packaging will be cut by approximately 46.3 metric tons for every 10 million Huawei phones.

The proportion of plastic packaging for P50 series phones — Huawei's new flagship phones — decreased by an impressive 89% compared with P40 series phones, and is currently lower than 1%. We will also apply these same measures to our other phones, earphones, watches, bands, tablets, and PCs, among others to deliver on our promise of providing consumers with eco-friendly products that promote sustainability.

Lighter user manuals

Our user manuals have been redesigned to save paper while making them more accessible.

Designing lighter user manuals not only saves paper, but also reduces energy consumption and carbon emissions when the product is being shipped. Although efforts have been made to reduce the content in paper user manuals, Huawei still offers a rich array of information through its pre-installed Tips app on Huawei devices, so that consumers do not lose out.

In 2021, the user manuals for a wide range of Huawei devices, including phones, tablets, PCs, wearables, and IoT products, were updated to be thinner and lighter. The number of pages in these manuals has decreased by 80% on average, saving 1,226 metric tons of paper and eliminating 34,765 metric tons of carbon emissions in the process. In 2022, this change has been applied to audio products and other devices, saving 1,250 metric tons of paper in the first half of the year alone.

Dimension	2020	2021	2022-H1
Products	Phones, tablets, and PCs	Phones, tablets, PCs, wearables, and IoT products	Phones, tablets, wearables, IoT products, and audio products
User manual pages reduced	63%	80%	83%
Paper saved (metric ton)	426	1,226	1,250
Carbon emissions reduced (metric ton)	12,080	34,765	35,446

(Note: The data in the preceding table indicates improvements compared with 2019)

Green production to boost our eco-friendliness

A significant portion of carbon emissions from electronic products occurs during the manufacturing process. To minimize damage to the environment throughout product lifecycles and reduce the carbon footprint of our products, we have been pushing for the adoption of energy-efficient techniques as well as renewable and clean energy in the manufacturing process. Moreover, we require our suppliers to set carbon emissions reduction targets and implement them in a bid to conserve energy and reduce emissions throughout the supply chain.

Carbon emissions reduction in our operations

Carbon neutrality has become a common goal among many countries and regions across the world, who have each implemented their own goals to achieve this. To reduce carbon emissions, countries and enterprises must inevitably focus more on clean and renewable energy. At Huawei, many of our operations already run off renewable energy. We have already built PV plants on our campuses, and proactively use clean energy to slash carbon emissions.

To improve energy efficiency on campus, Huawei has strict requirements on large-scale equipment selection for Huawei-run projects, as well as on site selection and decoration for lease projects. By using better performing equipment, we can cut the total cost of construction, operations and maintenance (O&M), and management. Moreover, we carefully consider the decoration and functionality of sites during selection, to ensure smooth operations with minimal costs throughout the lifecycle.

Renewable and clean energy used by Huawei in China in 2021

Unit: 10,000 kWh

Renewable energy
(e.g. hydropower, wind power, and solar power)
- 2020: 21,916
- 2021: 31,187

Clean energy
(e.g. electricity generated from natural gas)
- 2020: 147,575
- 2021: 156,497

PV plants on a Huawei campus in Hangzhou, China
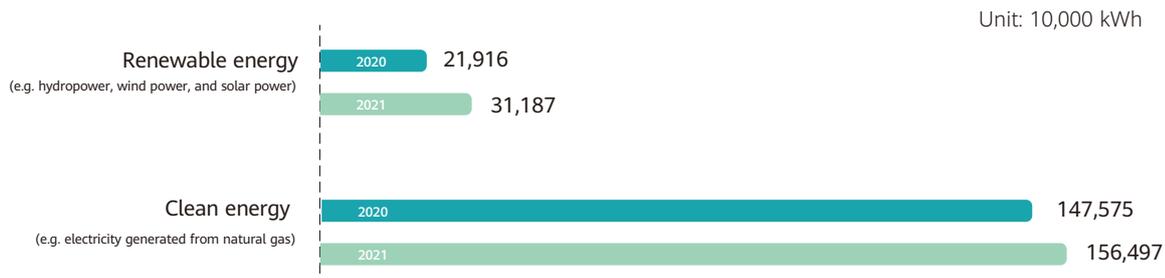
Carbon emissions reduction across the supply chain

Our supply chain is huge, meaning cutting our suppliers' carbon emission is paramount to energy conservation and emissions reduction of the entire industry chain.

At Huawei's supplier carbon emissions reduction conference held on May 24, 2022, four Huawei consumer business suppliers won the Huawei Supplier Excellent Carbon Emissions Reduction Award. The winners shared their stories. One of them had planned Science Based Targets initiative (SBTi) and been committed to achieving carbon neutrality by 2050. According to that supplier, among its total emissions reduction in 2021, 14% came from energy saving and 86% came from using clean energy. Another supplier explained its 3R principle, i.e. Reduce (energy saving and emissions reduction), Replace (transition to renewable energy), and Resolve (carbon offset and capture) for reducing carbon use, and spoke about its plan to achieve carbon neutrality by 2030.

Carbon emissions reduction requirements for Huawei suppliers

Set emissions reduction targets: Set targets for at least five years. It is recommended that challenging carbon emissions reduction targets be set in accordance with the SBTi and the average annual electricity consumption reduction be no less than 1% of the total annual electricity consumption.

- -

Develop an emissions reduction plan: Specify the carbon emissions reduction path with reference to the target set, and make clear and executable carbon emissions reduction plans, such as annual carbon emissions reduction project plans and clean energy use plans.

- -

Specify responsible organizations: Specify the responsibilities of and requirements for their carbon emissions reduction organizations, and invest resources, in an effort to achieve annual carbon emissions reduction targets.

- -

Collect carbon emission statistics: Every year, report carbon emissions relating to Huawei business. It is recommended that suppliers collect carbon emission statistics in accordance with ISO 14064 and disclose total carbon emissions in their annual CSR reports or by other means.

In 2021, Huawei suppliers' carbon emission intensity decreased by 2.0% compared with 2020.

Helping suppliers identify energy saving opportunities and improve energy efficiency

For most factories in the electrical and electronic industry, industrial power consumption accounts for at least 95% of their carbon emissions. Therefore, saving power is critical for reducing carbon emissions.

One of Huawei's suppliers used energy including electricity, natural gas, petroleum, and diesel, of which electricity consumption was the source of 97.6% carbon emissions, and the annual electricity fee paid by the supplier's factory equated 95.3% of the total energy fee.

In 2021, we invited energy management experts to train the supplier's staff and analyze how they consume their energy. These experts also helped the supplier improve their energy management by identifying opportunities to save energy, and improve energy efficiency through careful management and technology.

Thanks to such support, the supplier identified 11 areas where they can save energy, covering energy saving management, production lines, lighting, compressed air, air conditioners, and renewable energy. By implementing changes, the supplier was projected to save more than 13 million kWh of energy, reduce carbon dioxide emissions by 10,182 metric tons, and decrease the energy cost by CNY9.08 million every year, recovering its energy saving investment in two years and nine months.

Considering that the supplier encountered difficulties in making a high lump sum investment, energy management experts classified the identified energy saving opportunities into four phases. For the top three measures, the investment required (i.e. CNY7,020) was lower than that of other measures, and were naturally faster to pay off, saving approximately 14,498 kWh of electricity per year. This in turn saw carbon emissions drop by 11.71 metric tons. The implementation of a series of energy-saving measures helped the supplier save more than CNY800,000 a year, to the pleasure of the supplier.

Longer product lifespans: Reducing resource strain

One of the most effective ways to protect resources is to manufacture products of high quality and durability. That is why we conduct strict durability tests on our products before they're made available, and provide consumers with gradual system updates, and affordable repair services, to extend product lifespans, reduce resource consumption, and contribute to a circular economy.

Product durability

We ensure our products' long-term durability with a range of comprehensive hardware reliability tests before putting them on the shelves.

Bolstering phone durability

We want our products to last as long as possible, and therefore durability is a key focus throughout the design phase. We select durable materials to manufacture ultra-reliable hardware, and have built state-of-the-art testing labs around the world. To comply with stringent international standards, we have conducted in-depth reliability tests to ensure that each product can withstand and adapt to extreme conditions, including drops, impacts, and changes in temperature and moisture, so that products are more than equipped to handle everyday wear and tear.

Dropping

You risk accidentally dropping your phone every day, when you walk, run, or reach for it. We subject our phones to dozens of drops in the lab to simulate the typical height of falls onto hard surfaces. To be considered drop resistant, phones must maintain an intact screen, and continue to function as normal following a drop. We also conduct hundreds of rolling tests, whereby phones tumble freely in a rotating cylinder, helping us quickly spot and address a phone's weak points.

Extreme temperatures

Environmental factors cause 52% of operational failures in electronic products. Of those, 40% are caused by dangerous temperatures. Our labs simulate conditions in diverse global environments, and test the mechanical and electrical performance of our phones over fluctuating high and low temperatures, which typically occur during shipment and storage.

Splashing

Phones are often exposed to rain and spilled beverages, which is why we have designed robust splashing tests. Many of our flagship models have a water and splash resistance rating of IP68, enabling them to withstand a sudden downpour or accidental splashes and spills.

Scratching

Device surfaces naturally get scratched over time. Through coating hardness, artificial sweat resistance, alcohol resistance, and tape-peeling tests, our phones have become more scratch resistant. This means that you do not need to worry about your phone rubbing against other objects in your bag.

Button pressing

The next time you press the volume button on your device and it works as expected, you can thank those responsible for button durability testing. We test the durability of our phone buttons by simulating actual phone use and subjecting each model to up to hundreds of thousands of button presses.

Item	P20 Pro	Mate 20 Pro	P30 Pro	Mate 30 Pro	P40 Pro	Mate 40 Pro	P50 Pro	P50 Pocket
Water resistance	IPX7	IPX8	IPX8	IPX8	IPX8	IPX8	IPX8	IPX3
Dust resistance	IP6X	IP6X	IP6X	IP6X	IP6X	IP6X	IP6X	IP5X
Splash resistance	Water-sprinkling	Water-sprinkling	Water-sprinkling	Water-sprinkling	Water-sprinkling	Water-sprinkling	Water-sprinkling	Water-sprinkling

PC quality assurance

Huawei laptops are designed to be durable from their very conception. As computers are used in all aspects of our lives, we have designed wide-ranging reliability tests covering all usage scenarios, including laptop lid opening and closing, key pressing, touch controls, scratching, extreme temperatures, and dust. All these tests aim to ensure consistent product liability and user experience regardless of the environment.

Laptop lid opening and closing

A laptop shaft experiences wear and tear each time the lid is opened or closed. We simulate actual laptop use and conduct a thorough battery of tests, such as lid opening/closing strength and endurance tests, to ensure that our laptops meet user expectations.

Key pressing

We test the lifetime of laptop keys by simulating actual laptop use and subjecting each model to up to millions of key presses.

Touch controls

A smooth, comfortable touchpad is critical to the laptop user experience. All of the tests that we conduct on our laptops, including surface friction coefficient, water drop contact angle, abrasion, and elastic curve tests, aim to provide that perfect sense of springiness and sleekness.

Scratching

Consumers these days want their laptops to last for years and years, and that why we value the wear resistance of the laptop surface, which is critical to building durable laptops. To make our laptops scratch resistant, we conducted tests covering robust coating hardness, artificial sweat resistance, alcohol resistance, and tape-peeling. This means that you do not need to worry about your laptop rubbing against other objects in your bag.

Extreme temperatures

Our labs simulate conditions in diverse global environments, and test mechanical and electrical performance of our laptops over fluctuating high and low temperatures, which typically occur during shipment and storage.

Dust

Dust is everywhere — floating particles in the air, pollen, bed dust, cigarette smoke particles, and biscuit crumbs. Our laptops have passed professional dust tests, proving that their mechanical and electrical performance does not deteriorate as a result of dust accumulation.

Parts repairable at a service center

	MateBook D14	MateBook 14s	MateBook X Pro 2022
Display	✓	✓	✓
Battery	✓	✓	✓
Speaker	✓	✓	✓
Keyboard	✓	✓	✓
Touchpad	✓	✓	✓
Camera	✓	✓	✓

HUAWEI Vision quality assurance

We conduct more than 300 hardware reliability tests on each HUAWEI Vision model to guarantee they deliver the best possible experience for customers.

High temperature and humidity test	In-vehicle device reliability tests to ensure that boards enjoy an ultra-long service life.
Temperature shock test	In-vehicle device reliability tests in extreme environments.
Device tests in alternating high and low temperature environments	Reliability assurance for home products in extreme usage environments.
Salt mist test	Corrosion resistance assurance for devices. For example, even devices used in coastal areas will not erode easily.
Load test	Device reliability assurance, and deformation resistance.
Key durability test	Key lifetime assurance: 15+ years, when each key is pressed six times per day.
Connector insertion and removal durability test	Connector lifetime assurance: nine years, when removed and inserted three times per day.
Packaging drop test	Packaging and structural integrity assurance.

Wearable quality assurance

Huawei's wearables function normally under a number of high intensity activities. We strive to improve our products' reliability, starting right from the design phase. We have designed all-around reliability tests for work and sports, covering water resistance (during diving and swimming), mid- and long-term sweat simulation, strap torsion, surface abrasion, and collision simulation, ensuring that our products are suitable for all scenarios.

Water resistance (swimproof) test

We have gone far beyond simply performing static water resistance tests on our wearables — and even invented an instrument for dynamic water resistance tests. We have also conducted custom underwater button endurance simulation tests, which complement integrated water resistance tests that cover temperature, humidity, drop, and other factors.

Sweat simulation test

Since wearables are in close contact with the user's skin, and often exposed to sweat, we conduct sweat infiltration and wrapping tests on wearable straps and bodies through an artificial sweat solution created in the lab. Such tests, along with high temperature and humidity tests, ensure that consumers can use our wearables worry-free of sweat.

Strap torsion test

We conduct strap tensile, tensile durability, and pull and torsion durability tests to ensure that the straps on our wearables are robust across diverse usage environments, including daily wear, removal, and accidental pull and torsion.

Surface abrasion test

To enhance the wear resistance of the surface on wearables, we conduct in-lab alcohol resistance, rubber abrasion, dry and wet abrasion, steel velvet abrasion, and spike abrasion tests to simulate varying levels of wear and tear.

Collision simulation test

Wearables will inevitably experience bumps and bangs, which is why we conduct steel ball impact tests in our labs against the whole surface of the product.

Exploring the underwater world

HUAWEI WATCH GT 3 supports IP68 and 5ATM water resistance, and has built on its 200 rounds of pressurized water resistance test cycles to achieve breakthrough diving-level water resistance. Adventurists can wear it even when they go deep free diving, to experience the extraordinary underwater world.

Item	GT2	GT2 Pro	WATCH 3	GT3	GT3 Pro	WATCH D
Water resistance	5ATM	5ATM	5ATM	5ATM	Diving with a maximum depth of 30 m	IPX8
Dust resistance	IP6X	IP6X	IP6X	IP6X	IP6X	IP6X
Test scenario	Swimming	Swimming	Swimming	Swimming	Free diving with a maximum depth of 30 m	Raining

Reliability of smart home products

We conduct strict tests on smart home products to enhance their reliability and extend their service life.
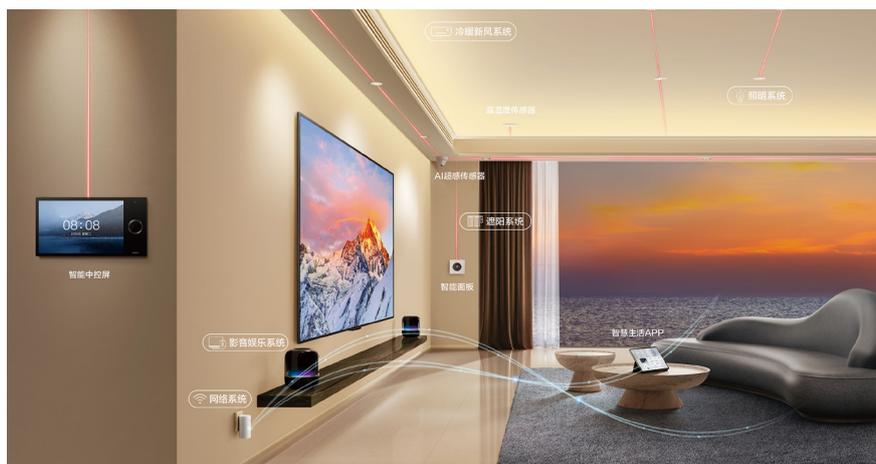
18
Environment protection reliability items

23
Mechanical reliability items

15
Packaging reliability items

12
Surface processing reliability items

High temperature and humidity test	Long-term high temperature and humidity tests to ensure long service life of boards.
Salt mist test	Salt mist simulation to test the corrosion resistance of devices.
Device tests in alternating high and low temperature environments	Reliability assurance for home products in extreme usage environments.
Dust test	Simulation of long-term dust accumulation to test product functionality.
Opening/Closing a switch product 100,000 times	If a switch is turned on/off 20 times a day on average, the product is expected to be used for 10 years or longer.
Touching a screen 200,000 times	A service life of five years or longer.

| Product updatability

The longer a product of ours is used, the more money it saves for our customers, and the better it is for our planet.
We strive to provide an ultra-smooth system experience backed by regular system updates, to ensure that even products from years ago remain in good working order.

Consumers these days are completely immersed in a world of smart devices. However, since device operating systems vary, device connections and operations are needlessly complex, resulting in a disjointed user experience. On June 2, 2021, Huawei launched the upgraded version of HarmonyOS, a smart device operating system. This update delivers a shared language to facilitate pooled intelligence, interconnectivity, and seamless synergy of different devices. HarmonyOS 2 is a commercial version, based on the open-source project OpenHarmony 2.0, which was created by Huawei with the aim of providing a smart cross-device experience for all usage scenarios. HarmonyOS 2 provides a brand-new experience in terms of UX design, all-scenario functionality, performance, and security.

To improve the convenience, security, and experience of HarmonyOS-powered devices, Huawei has supported updates to HarmonyOS 2 on more than 100 device models, including the HUAWEI Mate 40 series, Mate 30 series, P40 series, Mate X2, nova 8 series, MatePad Pro series, and even the Mate 9 series, which was launched way back in early 2016. Thanks to constant updates, devices that are years old can still enjoy the benefit of cutting-edge technology.

As of the end of November 2022, HarmonyOS had already been installed on over 320 million devices, making it the world's fastest-growing mobile device operating system.

Our most extensive system upgrade yet

Mate 9 series   P10 series   Mate 10 series   P20 series   Mate 20 series   P30 series   Mate 30 series   P40 series   Mate 40 series   Mate X series

Data source: Huawei data platform

Product repairability

Access to reliable and affordable repair services increases the lifespan of each phone, and reduces potential waste. We have established over 3,000 service centers worldwide to provide accessible repair services, reliable repair methods, and affordable repair plans, supplemented by high-level repair centers, which offer more specialized repairs. We have done our utmost to extend the lifetime of all of our products. Since 2020, the services provided by our high-level repair centers for repairing motherboards, screens, and other parts have extended the life of more than 8 million devices.
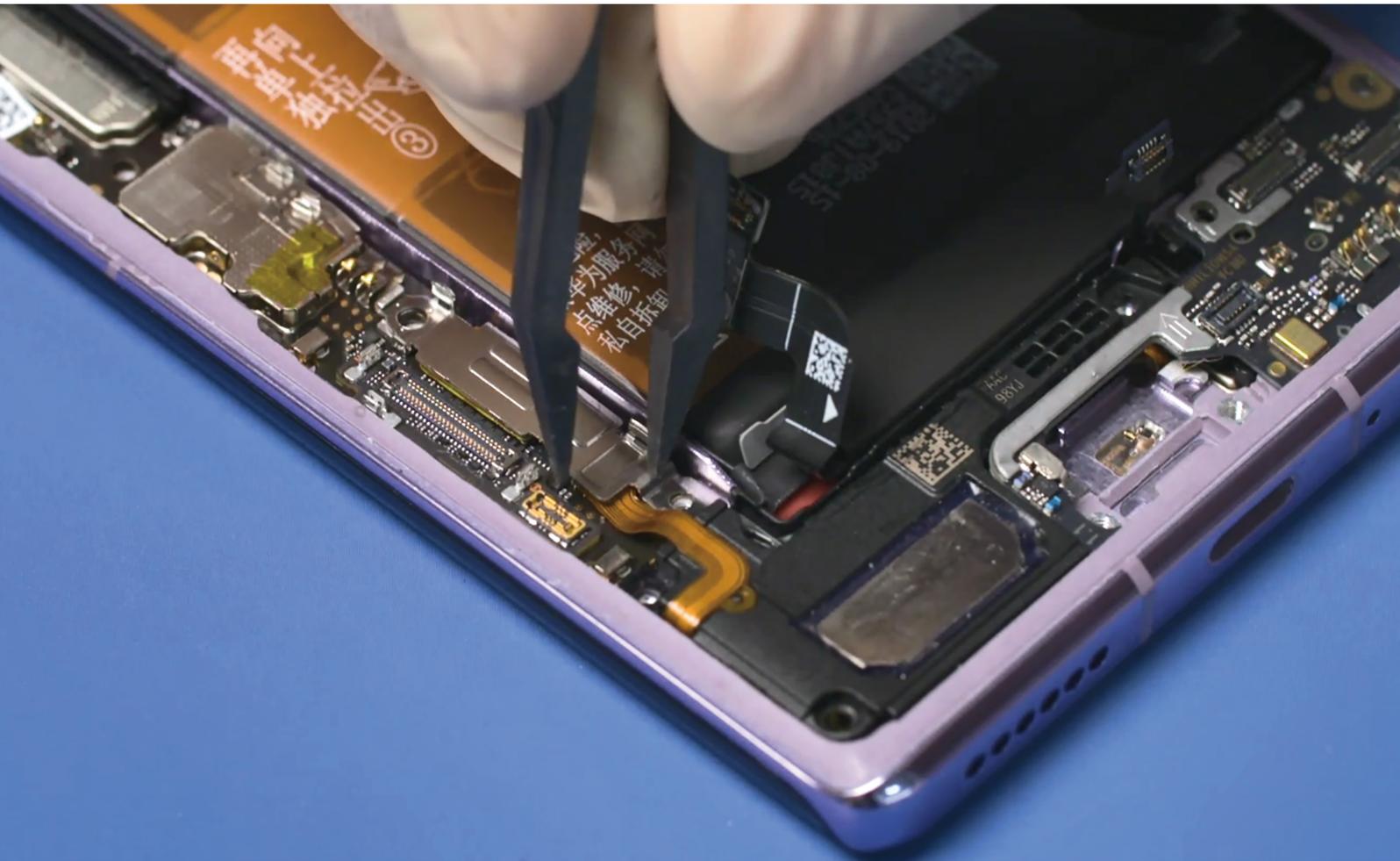
A more convenient repair network

Our repair service network is available across the globe, which means that there will be a local service center wherever you are. We also offer door-to-door and postal repair service options. Devices purchased through official channels in the Chinese mainland can be sent and received by mail for repair, with no additional mailing fees.

To provide consumers with a faster and more professional level of service, we have adopted a three-tier repair system and deployed country-level repair stations, service centers, and regional repair centers. First, we provide users with self-service solutions, so that most common software problems can be resolved at home. We have also established over 3,000 service centers around the world to provide on-site one-hour repair services. In 2021 and 2022, Huawei service centers have provided on-site services, including consultation, device replacement, and board replacement, for more than 25 million devices. Devices that can't be repaired on-site are sent to Huawei's high-level repair centers.

More reliable repair methods

We have developed repair policies for our full product portfolio, built up a global repair center network, and provided tailored repair solutions — fast repair services for devices with minor faults and replacement services for those with major faults. In 2021 and 2022, our one-hour repair rate has reached a remarkable 98%.

We employ a highly skilled team of professional repair technicians to quickly identify and address any issues with our devices, extending the lifespans of our products. Our user manuals also walk consumers through simple and direct solutions to minor everyday usage issues. We provide compliant and easily accessible user guidance and warranties for each of our products.

We have continued to bolster our repair capabilities, so that in addition to phones, our repair services also cover HUAWEI Vision, smart speakers, watches, bands, wireless earphones, smart glasses, and routers, among many other types of products.

More affordable repair plans

Our affordable repair services mean that customers are likely to get their phone repaired rather than purchase a new one.

We continue to offer a flat rate battery replacement program internationally, which covers more than 110 different models, and is supported in over 1,300 service centers and in online stores. Every month, this program provides affordable and convenient battery replacements to over 200,000 consumers. Through this battery replacement program, hundreds of thousands of mobile phones every month are repaired to work like new. We also offer a discounted flat rate for repairs, while maximizing component reuse and guaranteeing a top level of service.

We have also launched a refurbished motherboard campaign for phone models sold in the Chinese mainland. What this means is that if the motherboard of a device experiences a fault beyond the scope of the warranty, its user will enjoy access to a Huawei-manufactured motherboard at a discounted price of up to 70%. We also have a system for circulating screens that are no longer under warranty, which has been broadly promoted across many countries and regions outside China.

In 2021, we initiated a memory upgrade plan for Huawei phones in use, providing a larger storage space for consumers, allowing them to capture more wonderful moments, and prolonging the service life of their phones.

Carbon emissions reduction through green warehousing and transportation

Eco-friendly warehousing solution, a foundation for greener logistics services

With the rapid development of e-commerce, consumers have come to expect faster deliveries. To deliver on this, companies have tended to expand their warehouses to cover a broader geographic area. But this has led to difficulties in choosing the best location for building a warehouse as well as in building eco-friendly warehouses, all while ensuring broad coverage is achievable.

Huawei is committed to green warehousing and the sustainable use of resources. We have made gradual improvements in warehouse network planning, energy saving and consumption reduction in logistics parks, streamlined logistics packaging, resource recycling and circular sharing, and the application of new logistics technologies, among other key fields.

Appropriate warehousing network planning

We have optimized warehouse layouts and carefully selected warehouse locations that cut down the distance for transporting products, thereby slashing energy consumption.

Streamlined logistics packaging

By improving product packaging, we have eliminated excessive packaging and padding. We have also removed custom package seals based on trustworthiness, in order to reduce the use of packaging materials. Paper use fell by 5% year-on-year.

Logistics technology

We have improved our warehouse space utilization and increased warehouse automation, even building partially autonomous warehouses.

Energy saving and consumption reduction in logistics parks

By seamlessly connecting logistics platforms with vehicles, we have slashed warehouse energy consumption as well. Carbon emissions decreased by 3% year-on-year.

Resource recycling and circular sharing

We have reduced the consumption of cartons by reusing customized containers. Packaging material (pallets, cartons, etc.) consumption has also been slashed thanks to robust recycling and circular sharing policies, equivalent to saving more than 100,000 trees each year.

Safer and eco-friendly e-commerce solution, a foundation for green delivery services

Huawei's online stores ship more than 10 million parcels to consumers every year, and protecting the environment is just as important to us as safely delivering every parcel. To reduce environmental pollution, such as the creation of packaging waste during express delivery, we have endeavored to diminish resource consumption in 2021 and 2022, by canceling paper–shopping lists, and reducing the use of other paper materials (e.g. cartons) and tapes, among others.

Canceling paper–shopping lists to reduce paper consumption

This initiative has been piloted since early this year, and has affected nearly 1 million orders, saving nearly 500,000 pieces of A4 paper, which is the equivalent of cutting down 50 trees.

500,000

Saving nearly 500,000 pieces of A4 paper, which is the equivalent of cutting down 50 trees

Reducing carton and tape use

To protect products during transit, we have used simple bubble bags instead of cartons as the outer package of parcels. It is estimated that this can help save more than 3.2 million cartons, and reduce the use of adhesive tape by over 1.6 million meters and that of plastic packing bags for express delivery by over 500,000 square meters a year.

500,000

Saving more than 3.2 million cartons, and reducing the use of adhesive tape by over 1.6 million meters and that of plastic packing bags for express delivery by over 500,000 square meters
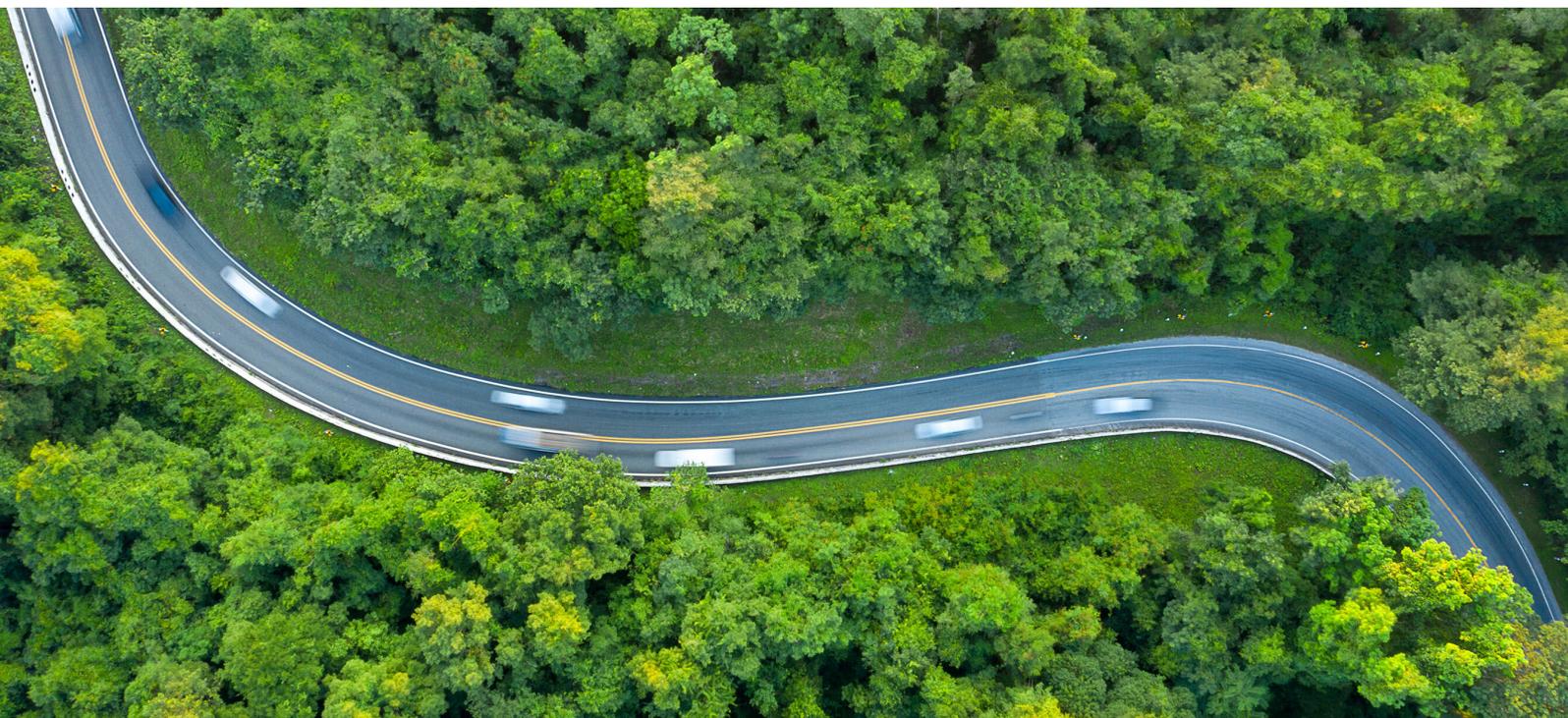
Green and efficient logistics:
Protecting our environment

In 2021 and 2022, we have continuously optimized our logistics and transportation solutions and minimized our carbon footprint from transportation, on the basis of market research results and delivery requirements.

Logistics service provider selection

Through our green partnership program, we have tried our best to select eco-conscious partners and assist them with utilizing clean energy or installing desulfurization towers, to ensure they meet industry-wide emissions standards. So far, more than 10 logistics service providers have already committed to using clean fuel or installing desulfurization towers. For example, DSV, one of our suppliers and the world's third-largest logistics company, has joined the United Eco-Skies program, and used Sustainable Aviation Fuel (SAF) to replace traditional fuels for air transport, reducing carbon dioxide emissions from chosen air freight shipment legs from 62% up to 75%.

Transportation mode selection

We meticulously track and compare the carbon emissions from air and sea transport, and apply a thorough framework for managing the transportation of different categories of products. Providing deliveries can be made in time, we always prioritize sea and rail transport, both of which results in substantially fewer carbon emissions. In 2021 and 2022, our green transportation capabilities have ramped up substantially, with 60.5% — a year-over-year increase of 12.6% and a historical high — of our goods are now transported via low-carbon methods, such as by ship or rail.

Shipment tactic formulation

Big data analytics enables us to forecast customer demand, plan shipment batches, and combine potential shipment orders whenever possible. When big data analytics is used with our loading simulation tool, we are able to maximize the loading rate of each container. Our intelligent logistics system has optimized goods, vehicles, and route synergy across the board, boosting the overall loading rate by 12.8% to 66.7% since 2020.

Transportation route planning

We have built an intelligent logistics system — TMS — to help scientifically deploy thousands of warehouses and transportation networks. With the tens of thousands of pieces of data it receives every day, the TMS engine is able to recommend optimal transportation routes that combine shipment needs whenever possible, and integrates transportation applications to the maximum extent. The milk-run, tailored vehicles, and other solutions are adopted to increase vehicle transportation efficiency and prevent energy waste. We have also developed new delivery solutions, such as onboarding in East China for shipments to Latin America, transit in Panama, cabinet sharing among customers in Morocco, and cabinet sharing across countries in Europe, to ensure prompt delivery, bolster the efficiency of transportation resources, and reduce carbon emissions.

Transportation management

We have encouraged our logistics service providers to enhance their transportation facilities and leverage smart, connected, and sharable tools, with the goal of making transportation as safe and eco-friendly as possible. To implement green transportation solutions, we have also developed an end-to-end framework that makes the logistics process visible, and aligns all related information to ensure efficient and effective communications.

Since September 2020, we have thoroughly optimized our logistics packaging for products shipped from China to Europe, Middle East & Africa, Russia, and more, by eliminating our use of pallet wrappers. Each such paper wrapper can be as heavy as 8 kg. This reduction alone is expected to reduce carbon emissions by 500,000 metric tons per year.

Recycling and reuse

Huawei is committed to recycling resources. We actively build a circular economy business model to improve resource utilization and reduce waste, and have ramped up our efforts to improve our global recycling system. Through certification of second-hand phones, trade-in, recycling, and many other programs, we aim to extend the life of our products, protect the Earth's resources, and drive sustainable development.

Recycling and trade-in

Trade-in, enabling 600,000 used devices to reach new owners

Reusing e-waste extracts additional value from it, and reduces its impact on the environment. Usable used devices are sold by our partners through official channels in the second-hand market after they have been repaired. As for unusable used devices, we hand them over to professional environmental protection enterprises to be recycled and disassembled, in an effort to cut down environmental pollution. In 2021, Huawei introduced a one-stop trade-in program in China, allowing customers to trade in their old device for a new one, boosting recycling and accelerating data migration. We also distribute cash coupons to the consumers who bring in old devices to be recycled, which can be used towards purchasing new Huawei products. Since 2015, Huawei has leveraged its trade-in program to find new owners for nearly 600,000 used devices.

Valuation of used devices, and online order placement → Free door-to-door pick-up by courier → Professional inspection and privacy data clearance → Prompt payment

Trash into treasure: More electronic waste recycled

To facilitate the recycling of e-waste, Huawei has ramped up efforts by continuing to improve its global recycling system for devices. By the end of 2021, Huawei's global recycling system had covered 2,000 recycling centers across nearly 50 countries and regions. This system recycles discarded devices in a compliant way, including phones, tablets, laptops, watches and bands, and speakers, and then processes them in an eco-friendly manner. Our newly opened Huawei service centers feature redesigned recycling bins, which are more standardized and professional. In 2021 alone, we collected and processed over 8,600 metric tons of e-waste through the Huawei recycling system.

Phone trade-in on Vmall: Facilitating the recycling of electronic products

In 2021, Huawei worked with industry-leading recyclers and service providers to perform closed-loop management of second-hand phones, from recycling, refurbishment, and reselling. We have established processes and standards that have incorporated a circular economy to perform end-to-end management, from device sources to sales channels. Each certified second-hand phone must have passed strict quality inspections to ensure that all components were manufactured by Huawei, and HarmonyOS and brand-new Huawei-produced batteries were installed. Huawei also supplies a one-year warranty period for such devices.

Huawei will then extend its second-hand device business from phones to tablets, laptops, and other products. A greater choice of high-quality second-hand devices will be available to consumers. This will further prolong our product lifecycles and reduce resource consumption.

Certified second-hand phones

Second-hand phones passing the tests conducted by Huawei or its certified partners are affordable and reliable phones. Before being resold, they must pass strict quality and function tests.

High quality
Passed more than 120 professional tests conducted by Huawei or its certified partners and 10-hour durability tests

Huawei genuine
Huawei-manufactured components, that are only disassembled or repaired with permission

Brand new battery
Huawei-manufactured batteries used for a long battery life

New system
HarmonyOS, bringing new seamless AI life experiences

Warranty
One-year warranty from Huawei

Environmental protection
Promotes the recycling of electronic products to prevent harm to the environment

| Resource reuse and closed-loop production

Resource reuse: Prolonging material life

When scrapping discarded devices, we extract most of the raw materials for recycling, which in turn reduces the demand for mining new resources. We also value resource reuse during device repairs. For example, used screens can be resold after they have been refurbished and passed strict tests, allowing users to purchase them at half the price of a new one. In 2021, through technological innovation, Huawei managed to extract screens that met quality standards from returned mobile phones, and used them as spare parts for services, adding another element of recycling. Consumers can now choose to replace their broken phone screens with refurbished ones at a discounted price. In 2022, consumers have also been offered used smart watch screens at a discounted price. These initiatives provide financial incentives to consumers while cutting down waste.

We reacquire and reuse raw materials from discarded devices and parts. This involves 23 processing steps in total, including deforming, scanning codes, sorting, magnetizing, unsoldering, stripping away tin, shredding, and extracting heavy metals from such electronics. By cooperating with professional suppliers, we have taken measures that eliminate the negative impact that used mobile phones might have on the environment, and enable us to reuse metals (e.g. aluminum, copper, and steel) and plastics, which might otherwise end up at landfills. In 2021, a total of more than 3,200 metric tons of scrapped materials were collected and handed over to our partners for compliant scrapping.

Eco-friendly product certifications

Obtaining environmental certification demonstrates Huawei's implementation of its green, environmental protection, and sustainable development philosophy, proving that Huawei provides industry-leading products in terms of environmental protection, such as use of eco-friendly materials. Since 2021, many Huawei products have passed domestic and international leading environmental protection tests to obtain certificates.

SGS green product certificate

Huawei products, including HUAWEI P50 series, nova 9 series, nova 10 series, and HUAWEI Freedbuds 4 series, have earned the highest level of certificate for rating green products from SGS. This certificate indicates that Huawei products have reached the industry-leading level in the green, health, and safety field.

Environmental protection rating certificate for electronic and electrical products

66 models of 21 Huawei phones and tablets, including HUAWEI Mate 40 Pro and MatePad Pro, earned an A classification from the China Quality Certification Center (CQC), which is the center's highest environmental protection rating for electronic and electrical products. This certificate indicates that Huawei products are friendly to the ecosystem and people's health, consume less energy and other resources, and achieve industry-leading environmental protection throughout their lifecycles.

China Environmental Labeling Certification

China Environmental Labeling Certification, commonly known as Ten Rings Certification, demonstrates that the certified product is of high quality, eco-friendly, safe, energy-efficient, etc. Since 2017, MateBook series laptops have earned China Environmental Labeling Certification. A few years later, in 2021, a series of PC products, including monitors, desktop computers, printers, and all-in-one PCs, were also certified.

Green Product Mark from TÜV Rheinland

Obtaining the Green Product Mark from TÜV Rheinland, based in Germany, indicates that a product has reached the world's leading level in hazardous substance management, energy efficiency, use of renewable materials, lifecycle assessment (LCA), and more. HUAWEI Mobile WiFi has obtained the Green Product Mark, which recognizes Huawei's implementation of green technologies and eco-friendly philosophy.

Corporate Responsibility

Repaying trustwith responsibility, through technology

100%

All of HUAWEI Flagship Stores, high-end experience stores, and service centers conduct routine self-assessments and on-site inspections of the EHS system.

70,000

From 2021 to 2022, more than 70,000 poplar trees were planted to improve soil quality and create an eco-friendly oasis.

100%

All of Huawei consumer business' suppliers have obtained the QC 080000 certification. Therefore, the environmental protection risks of its supply chain are under control.

1.5M

The total training received by Huawei consumer business staff exceeded 1.5 million hours in 2021.

Transparent and controllable data access

Simple and airtight data protection

Customer obsession

Innovative technologies for privacy security

We keep innovating and upgrading our privacy and security protection capabilities to provide all-round safeguards for users. HarmonyOS 3 has upgraded the privacy center and security center to make the security status of phones visible and allow users to manage their private data; enhanced the protection of privacy entailed in images, including removing sensitive information from images to be shared and intelligently identifying and hiding sensitive information; added an app control center, gathering risky apps and ensuring that they can run normally while being under control.

The App Guard mode has been synergized with the Senior mode, meaning it allows text and display size adjustments, and prevents elderly people from misoperations which result in downloading malicious software or sharing their personal data.

We care for children. If a device is signed in with a child account, apps, including HUAWEI Video and AppGallery, will automatically switch to content tailored for children and will be blocked from installing apps or displaying content not fit for children. A child account will also disable ad tracking, marketing activity message push, personalized ads, and others, creating a digital world free from disturbance. Sensitive operations, including payment, must be authorized by parents, so that parents have full control of what their children have access to.

Smart cockpits ensure privacy security when consumers use vehicles: Facial authentication is performed locally and securely, and biometric features are stored in local chips; data of different user accounts is securely isolated, and private information is visible only to its owner; the system-level permission protection framework ensures that user privacy is visible and controllable, and no app can obtain users' personal data without permission; and privacy models for typical scenarios are set to prevent the driver's privacy from leaking out to passengers.

Image privacy

Nowadays people are used to taking photos with their mobile phones and sharing them. Images are so common to us that many neglect the sensitive information that they contain, such as the shooting location, time, and device model. When sharing images, people may unintentionally leak their personal information. The privacy protection function of HarmonyOS 3 enables users to share and send images free from worrying about leaking any personal information.

- -

Image anonymization

On the image privacy page, users can enable Remove location info and Remove other info. After that, only system apps, including Gallery and Cloud, can obtain location and shooting information. If you share a photo through MeeTime, a social app, or other apps, no sensitive information will be contained in the photo.

- -
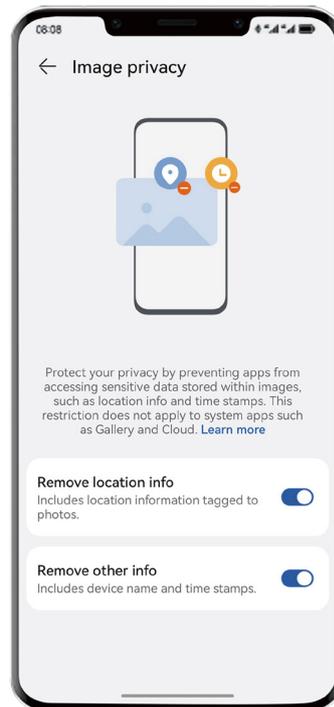
AI-powered image privacy: Automatically hiding sensitive chat content

People often use image retouching apps to mosaic information contained in the images or chat records to be shared. The new AI privacy protection feature of AI Touch, a highlight of HarmonyOS 3, saves users time and automatically identifies and hides key information in images, including names and numbers that have four or more consecutive digits (e.g. ID document number, ticket number, and amount). The feature also allows users to manually mosaic any information they want. It is handy for travelers who prefer taking photos of their train or air tickets and sharing them on social media platforms, for example. If they enable AI privacy protection, information, including the air ticket, flight, and passenger information, in the photos can be automatically hidden.

Privacy and security centers: Ensuring transparent, controllable, and easy-to-manage privacy protection

Privacy center

It records all the access each app on a device has to content, such as location, camera, microphone, and other sensitive permissions, in real time and displays it with icons. If an app frequently and unnecessarily accesses some permissions when the screen is locked, the privacy center will send a notification to remind the user to disable the permissions.

Security center

It monitors the overall security status of devices. Icons are used to replace lists for core functions, helping users quickly find security functions. The security center also provides options such as scam guard, virus scanner, harassment filter, and payment protection. It can even spot security risks for devices and provide suggestions accordingly. If a user has registered multiple devices under a single HUAWEI ID, they can view the security status of all their devices in the security center on any device.

Both the privacy and security centers proactively and intelligently provide security protection suggestions based on the phone status, saving users time and effort without over disturbing them.
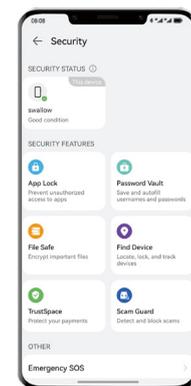
AppGallery: Endeavoring to protect users' privacy and security

AppGallery is committed to providing secure and reliable app distribution services. It strictly manages the apps that it distributes and provides privacy and security protection throughout the app lifecycle, including developer registration, review before app release, app installation and download, management of released app, and app use:

• Developer registration: Identity verification is required, and certificates and contact information must be verified.

• App release: All apps are both automatically and manually reviewed.

• App installation: A comprehensive app security inspection is performed, privacy tags are displayed to help users understand how an app will use their personal information, and tailored services are available for minors in strict accordance with age rating standards.

• Management of released apps: AppGallery constantly performs security scanning and tests to identify suspected violations and handle them accordingly.

• App use: AppGallery protects data security during the running of each app, and isolates apps from each other. To request a permission for the first time, an app always displays a dialog box, allowing users to accept or reject the request. Users can also manage app permissions at any time.

Eco-friendly retail stores for a secure and sustainable shopping experience

Huawei has opened more than 5,000 experience stores worldwide, including global flagship stores, HUAWEI SmartHome, and authorized experience stores. We not only combine technology with stylish store design, but also ensure our stores are as eco-friendly and sustainable as possible.

We have carried out EHS self-assessments and ad hoc inspections at all our stores, covering end-to-end store management, including EHS design, decoration, power consumption, fire safety, and operations security. Problems identified are promptly rectified. This provides a secure environment for consumers to shop.

We value sustainable development of the environment and incorporate eco-friendly practices into every material and decoration where possible, to work together with consumers and build an eco-friendly shopping environment. Our global flagship store on Nanjing East Road in Shanghai features big windows in the product experience area to allow more natural light into the building, which in turn cuts energy consumption and merges indoor and outdoor environments. Copper-colored metal plates used in the atrium area can be disassembled and recycled, which complies with the cyclic design principles for sustainable development. In our flagship stores at MixC in Qingdao, MixC in Wuhan, and Zone G at Huawei Industrial Base Bantian in Shenzhen, China, we adjust indoor light in line with available outdoor natural light, to showcase our products while saving as much energy as possible. In our flagship store in Riyadh, Saudi Arabia, we have integrated local art into our sunshade system, which leverages natural light but reduces the strength of direct sunlight, decreasing the workload of air conditioners.

Responsible supply chain

Both Huawei's products and its sustainable development practices are widely recognized, which stem from the efforts of Huawei and its global suppliers. We encourage our suppliers to carry out social and environmental responsibilities to a high standard, which include establishing a comprehensive CSR management system, respecting and protecting employees' rights and interests, and implementing responsible raw material procurement in the supply chain.

Responsible supply chain management standards

Huawei developed the Huawei Supplier Social Responsibility Code of Conduct, which raises the standards of our suppliers' CSR. This document intends to encourage cross-party cooperation with our suppliers regarding mutual environmental, social, and labor responsibilities.

This document encompasses five parts: Labor, Health and Safety, Environmental Protection, Business Ethics, and Management Systems.

Labor, and human right		Occupational health and safety		Environmental protection		Business ethics		Management systems	
Freely chosen employment	✓	Fire safety	✓	Environment permission report	✓	Honesty and integrity	✓	Corporate commitments and management responsibilities	✓
No child labor	✓	Hazardous chemical management	✓	Environmental requirements for products	✓	Intellectual property rights	✓	Risk assessment and management	✓
Protection of minors	✓	Occupational health managemen	✓	Pollution prevention	✓	Fair transaction, advertising, and competition	✓	Upstream suppliers management	✓
Working hours	✓	Security defense for devices	✓	Energy saving and consumption reduction Carbon emissions reduction	✓	Identity protection and non-retaliation policy	✓	Internal audit and management review	✓
Compensation and benefits	✓	Hazardous operation surveillance	✓			Responsible mineral procurement	✓		
Humane treatment	✓	Occupational injury management	✓			Privacy protection	✓		
Non-discrimination	✓	Emergency planning	✓						
Free association	✓	Dormitories and canteens	✓						
		Absolute rules	✓						

Responsible supply chain management process

Huawei has established a complete responsible supply chain management process and mechanism from sourcing to officially welcoming suppliers into cooperation and even the cooperation phase.

1 Sourcing

Get certified by ISO 14001 and ISO 45001.
No violation records at the Institute of Public & Environmental Affairs (IPE). If any exists, Huawei expects the supplier to clear such records.
No media scandals.

2 Certification of new supplier systems

Before becoming a Huawei supplier, an enterprise needs to pass a series of certifications, including CSR system certification, which is mandatory.

From 2021 to August 2022, Huawei consumer business inspected 116 enterprises when selecting suppliers. Of these, two of them failed the CSR system certification and were therefore not selected.

3 Signing the social responsibility agreement

After passing Huawei's new supplier system certification, suppliers must sign the Huawei Supplier Social Responsibility Agreement, which is consistent with the Huawei Supplier Social Responsibility Code of Conduct and elaborates the responsible supply chain management requirements for suppliers.

4 Annual on-site assessment

Based on the Huawei Supplier Social Responsibility Code of Conduct, we have developed a comprehensive supplier social responsibility evaluation system to review our suppliers' sustainable development capabilities. We invite third-party auditors to assess suppliers' social responsibilities from five dimensions at their production sites, and all the upstream suppliers will be assessed on a tiered basis.

5 Promoting improvement

We instruct suppliers to trace the root causes of any issues found in the on-site assessment and handle them accordingly. We incorporate these issues into the "Huawei Supplier Corrective Action Request (SCAR)" IT system and continue to follow up the implementation of the corrective and preventive measures. Suppliers must address such issues within 90 days. In response to the challenges and pain points found in our audits, we host management improvement seminars with our suppliers to help them quickly and effectively address such issues.

6 · Responsible performance assessment and results application

We assess the performance of our suppliers' CSR performance in an all-around way every year. The assessment result accounts for 10%–15% of the supplier's comprehensive performance assessment result, which will significantly impact our decision about future cooperation and will be used as a benchmark when we choose suppliers for new projects, managing category supplier portfolios, and others. Outstanding suppliers will be prioritized for future cooperation opportunities, whereas those who perform poorly will be given time to address their problems. We may, however, also reduce the procurement and level of cooperation with underperforming suppliers, or may even cancel the partnership altogether.
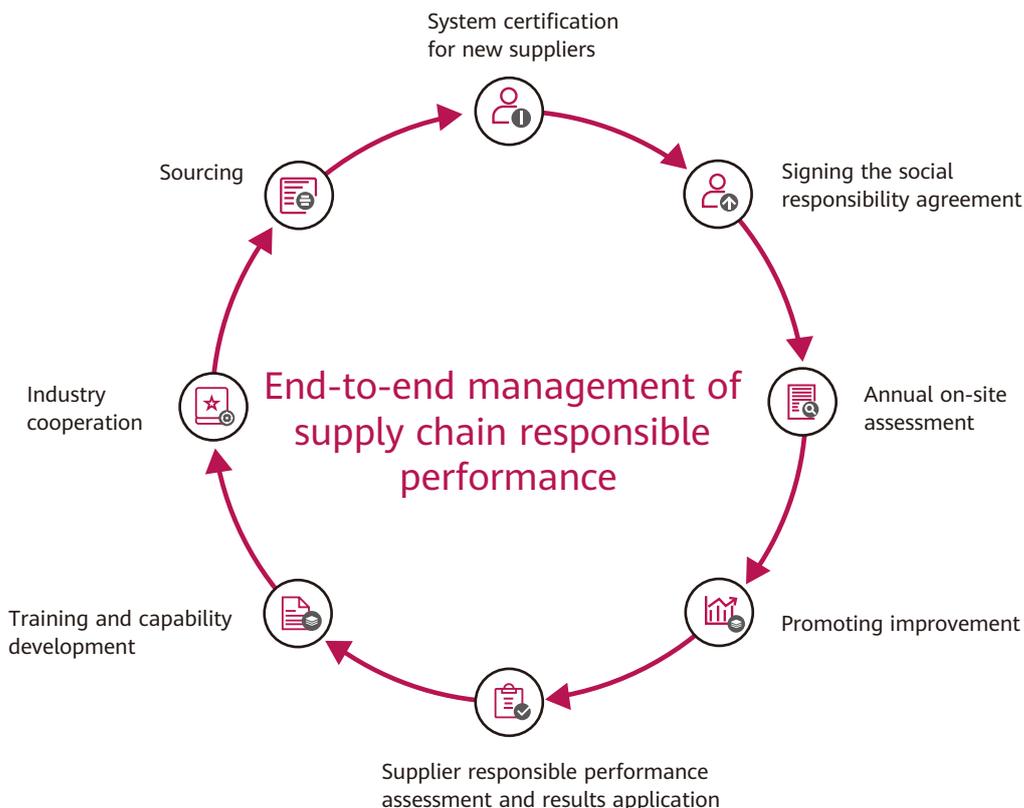
From 2021 to August 2022, we evaluated the sustainability performance of all our suppliers. Two of them achieved a C grade — a disappointing result — and were required to make rectifications within a specified period. Afterwards, we invited a third party to perform on-site check on the two suppliers, ensuring that the spotted risks from before were reduced to low levels.

7 · Training and capability development

We have constantly provided CSR training and guidance for suppliers and encouraged them to learn from industry-leading practices, incorporate sustainable development into their business strategies, reduce business risks, and improve operational efficiency. We have also partnered with professional organizations to carry out special projects to help suppliers improve their labor rights and interests, environmental protection, fire safety, and occupational health. These projects have benefited over 130 suppliers to date.

We have launched a strategic supplier development project to help suppliers identify development opportunities related to strategy, business, technology, quality, project management, and CSR, among others, all with the goal of improving their overall performance and competitiveness.

End-to-end management of supply chain responsible performance

- System certification for new suppliers
- Signing the social responsibility agreement
- Annual on-site assessment
- Promoting improvement
- Supplier responsible performance assessment and results application
- Training and capability development
- Industry cooperation
- Sourcing

Labor rights and interests and human rights at supplier side

Huawei continues to enhance the protection of labor rights and interests and human rights in its supply chain. We prioritize labor rights and interests and human rights in the CSR agreements signed with suppliers, CSR management requirements for suppliers, and CSR audits. To ensure a compliant supply chain, we push our suppliers to constantly improve.

Protecting labor rights and interests and human rights in Huawei's supply chain

Freely chosen employment

Suppliers must ensure that all employees are hired on a purely voluntary basis and are not forced to work. They must not restrict their employees' personal freedom or withhold their identification documents. Additionally, they must not use slave labor or engage in human trafficking, including transporting labor by threat, coercion, violence, abduction, or deception, and harboring, recruiting, transferring, or receiving such labor or services. Employees shall not be required to pay deposits, recruitment fees, or other fees to employers or agents.

Young workers

Suppliers shall comply with all applicable local laws and regulations regarding minimum working age and are forbidden from employing children. Suppliers shall also not allow legally-employed underage workers who are minors under the age of 18 to engage in work that may endanger their health or safety.

Compensation and benefits

The remuneration paid by a supplier to its employees shall comply with all applicable wage laws and regulations. Suppliers shall pay employees directly, in full, and on time, while also providing pay slips that detail pay clearly.

Humane treatment

In dealing with employees, suppliers must not use violence, including but not limited to verbal insults, threats, corporal punishment, sexual harassment, physical coercion, and illegal or opposite-sex frisking, or threat to commit such acts.

Non-discrimination

Discrimination against employees is forbidden during recruitment, remuneration, promotion, rewards, providing training opportunities, and dismissal, among others, on the basis of race, color, age, gender, sexual orientation, gender identity or gender performance, ethnicity, disability, pregnancy, religious belief, political affiliation, membership in social groups, protected genetic information, marital status, etc. Employees or prospective employees shall not be discriminately required to undergo medical tests or physical examinations.

Free association

In accordance with local laws, suppliers shall respect the rights of all employees to voluntarily form and join trade unions, conduct collective bargaining, engage in peaceful assembly, and refuse to participate in such activities. Suppliers shall allow employees and/or their representatives to regularly communicate with management personnel regarding working conditions and management practices, as well as express their views and concerns without fear of discrimination, revenge, intimidation, or harassment.

Strengthening responsible raw materials management

Launched 3TG investigation in 2011

We started investigating the sources of tin, tungsten, tantalum, and gold (3TG) in our products.

Traced 3TG smelters in 2013

In 2013, we traced the 3TG supply chain back to upstream smelters/refineries. We required suppliers to cut off raw materials supply from unqualified sources.

Improved responsible management process in 2015

To further improve the management of responsible raw material procurement, we asked third-party professional organizations to review our mineral management responsibility process and optimize the conflict mineral assessment and due diligence process in accordance with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas.

Started managing cobalt in 2016

We expanded the scope of responsible raw material management, started managing responsible cobalt, and joined industrial organizations to discuss the cobalt supply chain due diligence management plans with upstream and downstream partners in the industry.

Announced a policy in 2017

Huawei announced the responsible cobalt supply chain policy, and included the responsible cobalt management into the Huawei Supplier Social Responsibility Code of Conduct, in which suppliers are required to complete cobalt due diligence and communicate with next-tier suppliers about due diligence requirements.

Implemented a five-step method in 2018

In accordance with the Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains published by OECD and China Chamber of Commerce of Metals, Minerals & Chemicals Importers & Exporters (CCCMC), we implemented cobalt due diligence and appointed third-party organizations to audit due diligence on factories in the cobalt supply chain, tracing the supply chain back to cobalt smelters, and even upstream cobalt mines.

Further improved the system in 2019

We enhanced our mineral management responsibility system, by focusing on conflict-affected and high-risk areas while paying more attention to human rights and EHS risks over the entire supply chain. We insisted on extending supply chain management to the origins of minerals. In November 2019, Huawei sent representatives to the manual mining site in Democratic Republic of the Congo, and discussed upstream risk solutions with local governments, representatives of related organizations, and other stakeholders.

Progressed continuously in 2020

Huawei, as a customer representative of cobalt products, attended China's first International Forum on Sustainable Mineral Supply Chains (SMISC Forum) and shared its stories in building a more sustainable supply chain.

Established a system for responsible supply chain management in 2021

In 2021, Huawei rolled out its IT system for managing the responsible mineral supply chain, which helps collect, analyze, and process suppliers' responsible mineral management information more efficiently and manage due diligence more effectively.

Conducted due diligence on the mica supply chain in 2022

Huawei has conducted due diligence on the mica supply chain, in addition to that on tungsten, tin, tantalum, gold, and cobalt supply chains.

Environment protection by suppliers

We require our suppliers to improve their management of hazardous substances at standards higher than those of the industry and as specified in laws and regulations. In 2020, Huawei consumer business successfully pushed suppliers to completely prohibit the use of nine hazardous substances (such as benzene, toluene, and xylene) in the cleaning, degreasing, and demoulding agents during the manufacturing of its devices (including smartphones, PCs, tablets, audio devices, and wearables), and provided guidance for suppliers to cut and even stop the application of five substance types, such as hydrofluoric acid and nickel acetate. In 2021, Huawei upgraded its standards for managing allergens to a level far higher than the common standards in the industry, in a bid to strengthen user health safety without compromising user experience.

- **Huawei has incorporated its requirements for hazardous substance management into the procurement process and managed hazardous substances throughout the supplier lifecycle.**

Threshold >	System certification >	Agreement signing >	Risk assessment >
Only cooperating with QC 080000 certified enterprises	Reviewing new suppliers' environmental protection systems for products	Signing environmental protection agreements with all suppliers	Annually assessing environmental protection risks caused by suppliers' products and identifying high- and moderate-risk suppliers

Annual review >	Capability improvement >	Performance result use
Conducting annual reviews of environmental protection performance of high-risk suppliers' products Following up on problem solving	Providing training for suppliers Organizing environmental protection–related TQC training	Leveraging performance management to push suppliers to invest and improve themselves

- **Huawei has incorporated environmental protection into its requirements for products and managed it during product development and mass production.**

Requirement setting >	Material selection >	Sample approval >	Mass production control
Specifying a project's environmental protection requirements and passing the RFI/requirements to suppliers	Having suppliers select materials that are eco-friendly, and assessing the selection results	Having R&D personnel review suppliers' MCD Conducting diagnostic tests on high-risk materials/products Distributing codes/Setting environmental protection attributes	Conducting environmental protection certification of some products at TR5 (a phase in Huawei's R&D project) Inspecting the materials provided by suppliers Managing changes

Community

Creating jobs and cultivating talent

Huawei needs worldwide talent to create diverse teams. We have hired employees from 152 countries and regions, who have helped us understand and absorb a rich mixture of global culture, broadened Huawei's international vision, and promoted local employment and economic development. Huawei is committed to treating employees equally regardless of their gender, race, ethnicity, or religious beliefs, and promises to ensure that all employees have equal opportunities for jobs, learning, and career growth.

In China, Huawei consumer business has created over 80,000 jobs, and outside of China, that number is over 17,000.

84

Diversified and inclusive workforce development

Remarkable talent underpins sustainable development, and therefore creating a diverse team is key to helping us remain competitive and build products that consumers trust and enjoy. Huawei gathers global talent and provides multiple career paths for employees to unleash their potential and create engaging and innovative experiences to consumers.

In 2021, we arranged managers and business experts to share their hands-on experience, and invited industry experts to share their knowledge with our employees, to help the employees achieve sustainable development, broaden their business prospects, get a clearer picture of the industry's future. We also provided over 25,000 online courses and more than 1,000 systematic, in-person, premium courses. These courses attracted a total of more than 200,000 individual enrollments, and the training from last year exceeded 1.5 million hours.

CBG employees' age
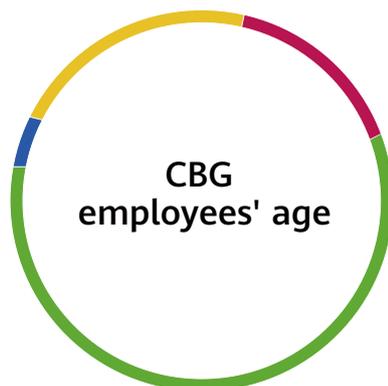
Under 25: **12%**

26–35: **56%**

36–45: **30%**

46 and above: **2%**

CBG employees' academic qualifications

Doctor's degree: 3%

Master's degree: 57%

Bachelor's degree: 38%

Others: 2%

Valuing employees' physical and mental health

We want our staff to strike a healthy balance between work and life, and create an environment that promotes employee well-being.

Societies

We have 20 interest groups, including badminton, jogging, and music, that employees can engage in.

Fitness and health groups

We have provided a variety of online and offline sports and team-building activities to encourage employees to achieve their goals and help them keep fit and stay healthy. This has so far attracted nearly 30,000 employees.

Pandemic prevention and assurance

The COVID-19 pandemic has caused widespread disruption since 2020. Huawei respects the advice of local governments, optimizes action plans accordingly, and provides employees with necessary and reliable resources.

Care for employees' physical and mental health

We have integrated internal and external health resources to give our employees all-round healthcare, which covers physical health, mental health, insurance, and daily health advice. We have also established an emergency response process, and provide Emergency Response Team (ERT) training every year. Moreover, we organize training and drills in offices to train employees in emergency response.

Office environment

We provide employees with spacious work areas and facilities, such as gyms, cafes, and nursing rooms, to meet their needs.

| **Working with communities**

As a responsible corporation, we actively engage with local communities, carry out various activities in such communities, and fulfill our responsibilities and work with local community organizers to contribute to community development.

Poplar seedlings grow quickly after the spring rain, despite the sandstorms and saline and alkaline land.

"Planting Poplar Trees in Gansu" public welfare initiative

Desertification is a major climate change issue that has impacted multiple parts of the world, and China is one of the countries that has been hit the hardest. To curb desertification caused by wind erosion and protect the environment, Huawei and the China Green Foundation launched a campaign to bring consumers together to plant poplar trees in Gansu Province, China.

From April 8, 2021, 62,439 poplar seedlings that were donated by Huawei and its consumers were planted in the desert in Jinta County, northern Gansu, China. This was the first grove of poplar seedlings planted in Jinta County in 2021. In early spring 2022, we planted another 9,333 poplar seedlings in Jinta County, which has merged into the first grove, expanding it, as expected by the donators. Poplar trees can reduce soil erosion, improve soil quality, and help create an eco-friendly oasis. They can also absorb a large amount of carbon dioxide. Each poplar tree absorbs on average

215 kg of carbon dioxide over its lifecycle. That means one hectare of properly planted poplar trees (calculated based on 630 trees per hectare) can absorb more than 135,000 kg of carbon dioxide over the trees' lifecycles.

So far, Huawei and consumers have planted 71,772 poplar trees in Jinta County, serving as wind breaks for over 113 hectares of land, which will help prevent desertification over an 850-hectare area of sandstorm-prone land, equivalent in size to 1,190 football pitches. These trees are expected to absorb 15,480 metric tons of carbon dioxide over their lifecycles, equivalent to pulling about 5,700 1.6L vehicles off the road for one year.

The "Planting Poplar Trees in Gansu" initiative is only a part of Huawei's commitment on environment protection. We understand that every small effort can lead to a better natural environment. We will continue to work with governments, non-profit organizations, customers, consumers, and partners to help build a greener world.

Technology and nature must coexist in harmony, and this remains one of Huawei's long-term core beliefs. Huawei is committed to reducing the impact of its production and operations, as well as its products and services during their full lifecycle, on the environment. Huawei is well aware that every small effort counts.

With an open mind and clear goals, we will continue to work with governments, industry associations, public welfare organizations, supply chains, and our consumers to boost sustainable development and better our social responsibilities. Meanwhile, we will continue to call on more people to get involved in the protection and restoration of the ecological environment by donating more desert poplar trees through Huawei's official website to protect our green environment.

Official website for the "Planting Poplar Trees in Gansu" public welfare initiative: https://consumer.huawei.com/cn/campaign/woyouyipianhuyanglin/?toCampaign

Appendix

| About This Report

Time scope

This report covers the period from September 1, 2021 to August 31, 2022. Some content in this report may cover the time before or after this period.

Scope of this report

The subject of this report is Huawei Device Co., Ltd., which includes all of its global branches, subsidiaries, and directly affiliated institutions.

Concerning titles

For easier readability, "Huawei", "Huawei consumer business", "Consumer Business Group", or "we/our/us" in this report refers to Huawei Devices Co., Ltd., unless otherwise specified.

Data sources and reliability statement

The data and stories in this report mainly come from Huawei's official documents, statistical reports, and publicly available information. Huawei promises that this report does not contain any false or misleading description and Huawei is responsible for the authenticity, accuracy, and integrity of the content thereof.

Obtaining and responding to this report

This report was published in November 2022 in both Chinese and English as an independent enterprise sustainable development report. If you would like to view or download this report online, please visit: https://consumer.huawei.com/en/sustainability/sustainability-report/?toCampaign

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