



Baidu 2022 Environmental, Social and Governance Report



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Make the Complicated World Simpler Through Technology



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About This Report

This Report is the fourth Environmental, Social and Governance (ESG) Report released by Baidu with a comprehensive reflection of its ESG performance.

Report Period

This Report is an annual report covering work of the financial year from January 1, 2022 to December 31, 2022 ("reporting period"). Part of information is beyond the reporting period. The data and information disclosed in this Report are sourced from official documents and statistical reports of Baidu, covering relevant information of all Baidu Core (excluding companies held by Baidu).

Basis of Preparation

This Report is compiled in accordance with the *ESG Reporting Guide 2.0* issued by the Nasdaq Stock Market, the *Environmental, Social and Governance Reporting Guide* and the relevant consultation papers of the *Listing Rules* issued by the Hong Kong Exchanges and Clearing Limited (HKEX), with reference to the "Ten Principles" of the United Nations Global Compact (UNGC), the *GRI Sustainability Reporting Standards* issued by the Global Sustainability Standard Board(GSSB), the *SASB Standards* issued by the Sustainability Accounting Standards Board (SASB), and the United Nations Sustainable Development Goals (UN SDGs).

Report Access

This Report is available on our official ESG website (esg.baidu.com) in simplified Chinese, traditional Chinese and English. For further details regarding our business ethics, privacy protection and data security, human capital, and low-carbon operations, please visit Baidu ESG website.

Your feedback is always welcomed and appreciated. Please email us at esg@baidu.com.

Forward-looking Statement

Part of this Report is forward-looking, subject to uncertainties, which could cause actual results to differ materially from those presented. Baidu undertakes no obligation to update any forward-looking statements provided in this Report.

Message from the CEO



Co-founder, Chairman,
and Chief Executive Officer

The year 2022 has witnessed multiple challenges including COVID-19 infection resurgence and geopolitical conflicts. Despite the major changes, Baidu is always committed to implementing ESG concepts into effective governance. We are convinced that technological innovation should be rooted in, and serve, human values, social responsibilities, and long-term governance.

In the past year, we kept digging further into the potentials of ESG concepts in corporate governance and offsetting uncertainties with the sustainable-growth mentality. We managed business risks, expanded business scopes, and explored new opportunities through continuous optimization of corporate governance. We also proactively assumed our social responsibility.

The effective delivery of reliable information is crucial. In today's world, "Search" does not simply refer to typing in the small search bar. Users can not only find answers to their questions on the platform, but also gain insight into fighting against the fear of the unknown. A case in point is that after China altered its COVID response measures in late 2022, we swiftly mobilized resources and launched the COVID-19 Index service to provide relevant information for over 360 cities across China. The accurate and reliable information that users obtained at critical moments is the embodiment of the responsibility and value undertook by Baidu as an information provider.

Security and innovation are top priorities at Baidu. We value data security and privacy, as well as the value of people behind the data. We are committed to building an AI-enabled data security ecosystem to provide every user with reliable services. Last year, both Baidu Mobile Ads SDK and Baidu Maps SDK passed the "SDK Security Special Action" product testing conducted by the Ministry of Public Security and China Academy of Information and Communications Technology (CAICT), and were awarded the Certificate of SDK Security Special Testing, an official recognition of their capability of protecting data security and privacy.

A green and sound environment is the prerequisite for people to live a healthy life. By leveraging powerful AI technologies, we are constantly exploring solutions to promote sustainable development in different sectors. In the electricity industry, Baidu AI Cloud helps to optimize the processes of air-cooling islands at thermal power plants by using Deep Learning (DL) algorithms to adjust fan speed parameters in real time. This could reduce the energy consumed in generating per kWh of electricity by 1.9 grams of standard coal. Scaled up across the nation, it would have an annual capacity of reducing carbon emissions by 7.35 million tons. In the transportation industry, Baidu's intelligent transportation system (ITS) has been deployed in 69 cities across China. With wider deployments planned in the future, Baidu will contribute even more to environmental protection. According to the calculation made by the China Academy of Transportation of Sciences (CATS), the annual reduced carbon emissions contributed by building Vehicle-Road collaboration (V2R) infrastructure in the 72 km² Beijing High-level Autonomous Driving Demonstration Zone is equivalent to planting 500,000 trees.

We care not only about the improvement of production efficiency brought by AI, but also the fairness and accountability of AI and algorithms. AI has evolved to a stage where all sectors are destined to be transformed by it. We have proposed the four principles of AI ethics before, but here I want to reaffirm them: AI should be "safe and controllable", which is the highest principle; AI's innovative vision is to promote more equal access to technologies and abilities for humanity; the value of AI is to empower mankind to learn and grow instead of surpassing and replacing mankind; the ultimate ideal of AI is to bring more freedom and possibilities to humankind.

Our mission – to make the complicated world simpler through technology, is in alignment with the ESG concept as both are designed to promote sustainability for human development, social and economic growth, environmental protection, and technological innovation. This is why Baidu has been committed to publishing this report every year: to not only visualize but also sustain our ESG efforts.

About Baidu

Baidu is a leading AI company with a solid Internet foundation, and one of the few global providers of full-stack technologies including AI chips, software architecture and applications.

With the mission of "Make the Complicated World Simpler Through Technology", Baidu has taken progress and development as its priorities and has always been an industry pioneer in AI chips, software architecture and applications. Baidu has been named by international organizations as one of the top four AI companies in the world.


Committed to the vision of "to be a Top Global Technology Company to Understands Users Best and Enables Their Growth", Baidu insists on improving people's sense of happiness through technology.



Strategic Business Layout of Baidu


After years of layout, Baidu has formed three major growth engines with Mobile Ecosystem, AI Cloud, Intelligent Driving and other cutting-edge businesses leading the industry as the core, by virtue of its profound AI technology accumulation, full-stack AI layout, prosperous and open AI ecology, and leading Internet platform advantages.

Baidu Strategic Business Highlights




Mobile Ecosystem
Steadily-growing Mature Business

- In 2022, Baidu App monthly active users (MAUs) reached 648 million
- More than 5 million content producers registered on Bai Jiahao, realizing a diversified income of creators mounted up by 230%



Baidu AI Cloud
Fast-growing Emerging Business


- The No.1 AI public cloud service provider in China
- One of the "Four Clouds" in China's cloud computing market



Intelligent Driving and Other Cutting-edge Businesses
Industry-leading Innovation Business


- The largest autonomous ride-hailing service provider worldwide
- The number of total patent families for autonomous driving ranked No.1 in the world
- Baidu Health - leading one-stop health management platform
- KUNLUNXIN - China's leading cloud-based full-featured AI chip
- Xiaodu - No.1 in smart speaker shipments in China

Independent Full-stack Layout, Integration of Hardware and Software, End-to-End Optimization

Baidu AI full-stack layout	Application	Search	Intelligent Transportation	Finance	Water	Electric Power	Haidian City Brain	...
	Model	ERNIE Big Model	Information Distribution Big Model	Transportation Big Model	Energy Big Model	...		
	Framework	 PaddlePaddle Deep Learning Platform						
	Chip	 Kunlun AI Chip						


Full-stack Layout of AI Self-development Technology

ESG Achievements in 2022

Enhancing Corporate Governance			
	Baidu obtained the ISO 37001 anti-bribery management system certification	Baidu was nominated for the Special Innovation in the third "China Integrity Innovation Award"	
	Baidu was selected as the "Pioneer Practice Case of Personal Information Protection Compliance Audit"	Baidu conducted 42 training sessions on business ethics	
	Baidu signed the <i>Honesty and Integrity Agreement</i> with 100% centralized procurement suppliers	Baidu held 11 ESG communication roadshows	
Baidu was listed in "2022 China ESG 50" by Forbes China			
Baidu was included in the constituent stock of Hang Seng ESG 50 Index.			

Baidu was awarded
BBB in MSCI ESG rating

Baidu scored 41 in S&P Global CSA, ranking within the top 5% in the industry

Contributing to Society			
	Baidu won	Baidu participated in	
	18	4	
	security-related honors and awards	national scientific research projects related to security and privacy	
	Baidu joined	Xiaodu watch voice assistant was selected as an excellent case of children's personal information protection App in the "Children Care Program"	
	50	security-related industry associations	
Baidu participated in the formulation of nearly	200	320	including
safety standards		safety standards in total	11 international standards
			89 national standards
Baidu AI Cloud obtained SOC 1, SOC 2 (covering security, availability and confidentiality)		Baidu Mobile Advertising and Baidu Maps were certified to the "SDK Security Special Evaluation"	
Baidu Apollo became the first Tier-1 intelligent driving supplier in China to pass the test and verification of intelligent driving data desensitization products		Baidu conducted privacy protection and data security training for all employees, covering	
		100% of new employee hires	
Nurturing Talent			

Promoting Green Ideas



The average PUE of Baidu data centers was

1.16

Baidu completed the transformation of the lighting systems of Baidu Campus and Baidu Technology Park.

4.8 million kWh of electricity is estimated to be saved annually

The annual average PUE of module 1# of Baidu Yangquan Data Center was

1.08

Baidu Data Center introduced

1 billion kWh of green electricity

participated in

5,080 MWh of green electricity trading in Beijing

After the construction and initiation of solar photovoltaic power generation system in Baidu Campus, Penghuan Building and Baidu Technology Park, it is estimated that about

2.6 million kWh of clean electricity for administrative operations can be provided throughout the year

Baidu Intelligent Signal Control and other intelligent transportation solutions are expected to reduce urban traffic carbon emissions by

70 million tons by 2030

Baidu AI Cloud, together with Zhonghuan Huanhui, has created a new intelligent heating mode of "Integrating Cloud and AI", reducing the energy consumption of heating enterprises by

10%-20%

An estimation of carbon dioxide emission reduction by

19 kg/m²

Baidu earned a

B

score from the Carbon Disclosure Project (CDP)

Baidu was awarded the

2022 Leap Progress Award

on Climate Change by the Carbon Disclosure Project (CDP)

Baidu won

2022 Bloomberg Green Gold ESG Pioneer Award

Improving sServices

Baidu intercepted malicious information

58.56 billion times

blocked malicious websites


77.8 billion times

prevented websites and Apps involving fraud

27 million times

protected citizens' personal information from malicious disclosures

220,000 times on a daily basis



Baidu AI robot inspects about

15 billion pieces of information per day

filtering more than

50 billion vulgar, gambling, and other banned advertisements

Baidu deleted

22,168 pieces of illegal information relating to stealing, unauthorized gathering, digging, selling and buying of rare and endangered wild plants

Baidu applied for more than 4,000 Chinese patents, with more than

2,700 granted

Baidu was awarded

13 China Patent Awards on AI

Baidu provides 24/7 service for more than 1 billion users with

500,000 daily requests responded

98.59% of complaints were handled with feedback

Baidu led more than

1,000 open-source projects on Github

with over

20,000 community contributors

Contributing to Society

Baidu pledged to nurture

5 million AI professionals in 2020

By the end of 2022, Baidu has cultivated more than

3 million AI professionals

Baidu AI Cloud XiLing "AI Sign Language Platform" helped more than

27 million hearing-impaired people get access to information and bridge the digital divide

Baidu donated

16,478 books to 30 primary and secondary schools in southwest and northwest China through the "Hello World" public welfare project

Baidu donated

66,600 antigen test kits

5,000 pieces of protective clothing

5,000 sets of epidemic prevention suppliers to the front-line areas in Beijing



Our Priorities

Communicating with Stakeholders

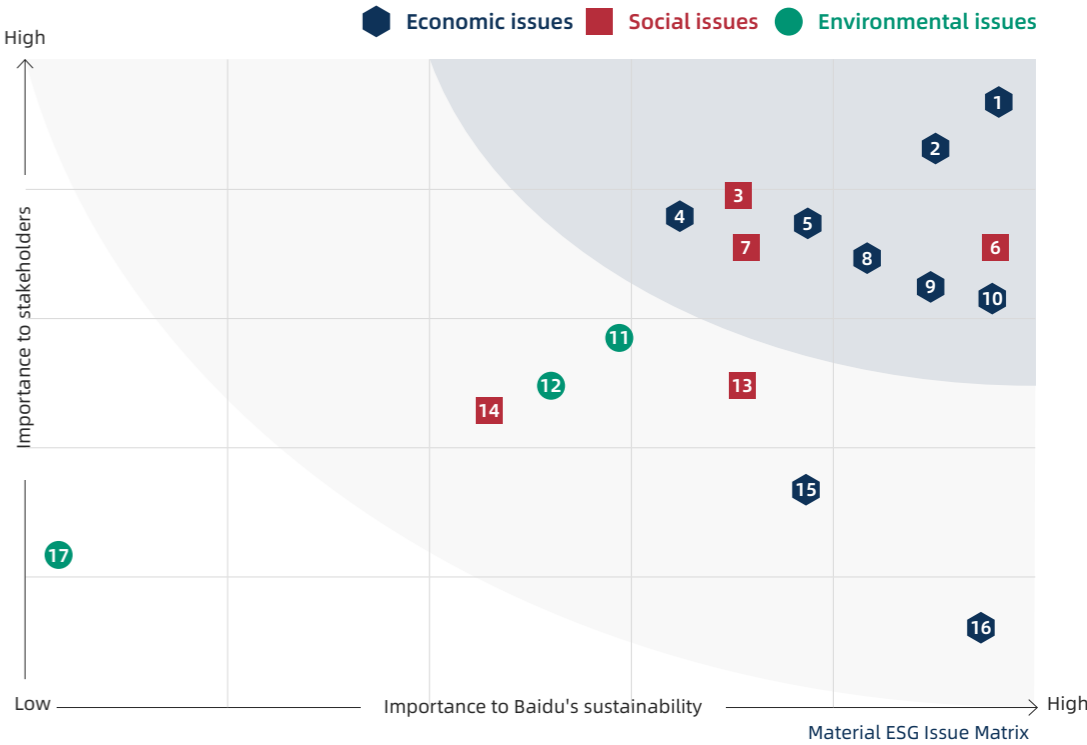
Baidu values opinions and suggestions of stakeholders and has established multiple channels for continuous communication with stakeholders to create sustainable value together.

Stakeholders	Means of communication		Expectations and demands	
Shareholders and investors	<ul style="list-style-type: none">General meetings of shareholdersPeriodic reports and announcements	<ul style="list-style-type: none">Communication with investors via emails and conferencesRoadshow of ESG communication	<ul style="list-style-type: none">Ongoing and stable growthCompliant operations	<ul style="list-style-type: none">Risk managementProduct service and quality
Users	<ul style="list-style-type: none">Feedback channelsProduct surveys	<ul style="list-style-type: none">Interaction via Baidu websites and social media	<ul style="list-style-type: none">Improving user experienceInformation securityData and privacy protection	<ul style="list-style-type: none">Ecological management of contentsProduct quality assurance
Governments and regulators	<ul style="list-style-type: none">Information disclosureCollaborative projectsRoutine communication and reporting	<ul style="list-style-type: none">Supervision and inspectionsVisit reception	<ul style="list-style-type: none">Compliant operationsInformation security	<ul style="list-style-type: none">Data and privacy protectionEcological management of contents
Employees	<ul style="list-style-type: none">Internal office systemsInternal meetings	<ul style="list-style-type: none">Regular surveys for feedbackOnline and offline training	<ul style="list-style-type: none">Protecting employee rights and interestsEmployee training and development	<ul style="list-style-type: none">Employee benefit guaranteeOccupational disease prevention
Suppliers	<ul style="list-style-type: none">Invitation for bidsProject procurementContracts and agreements	<ul style="list-style-type: none">Supplier management conferencesSupplier business communication meetingsOther supplier communications	<ul style="list-style-type: none">Sustainable supply chainIntegrity	<ul style="list-style-type: none">Mutual benefitEmpowering suppliers
Partners/NGO	<ul style="list-style-type: none">Baidu World CongressBaidu CreateABC SummitBaidu Union Summit	<ul style="list-style-type: none">Project-based cooperationTechnology exchangesAchievements sharing	<ul style="list-style-type: none">Technological innovationCooperative developmentProduct quality assuranceLow-carbon operationsCorporate social responsibility	
Media	<ul style="list-style-type: none">Press conferencesExclusive interviewsInvitation to meetings or events held by BaiduInteraction via our websites and social media		<ul style="list-style-type: none">TransparencyCompliant operationsInformation securityData and privacy protectionEcological management of contentsCorporate social responsibility	
Environment	<ul style="list-style-type: none">Adopting energy-saving and emission reduction technologyDeveloping green productsCultivating low-carbon awareness for users		<ul style="list-style-type: none">Emissions managementEnergy and resource conservationLow-carbon operations	
Communities	<ul style="list-style-type: none">Community activitiesInteraction via Baidu websites and social media		<ul style="list-style-type: none">Charity projectsVolunteering activities	

The Communication Mechanisms with Stakeholders

Materiality Assessment

In 2022, we developed the material ESG issue matrix through intensified research on UN SDGs, the *GRI Sustainability Reporting Standards*, the *SASB Standards* and other standards, factoring into mainstream ESG rating indexes in capital market, through frequent and irregular communication with stakeholders, as well as discussion and analysis of sustainable development by the management. There are no major changes in material ESG issue matrix comparing with that in 2021.



Importance	No.	Issue	Category	Location
High	1	Data and privacy protection	Economic	Building Trust - Personal Information and Privacy Protection, Data Governance and Algorithm Governance
	2	Information security	Economic	Building Trust - Security Management, Security Guarantee
	3	Protection of employees' rights	Social	Nurturing Talent - Talent First, Workplace Diversity
	4	Product quality assurance	Economic	Building Trust - Security Guarantee Improving Services - Content Management, User Experience Promoting Green Ideas - Green Products and Services
	5	Improving user experience	Economic	Improving Services - User Experience
	6	Staff development	Social	Nurturing Talent - Talent First
	7	Protecting Employees' benefit	Social	Nurturing Talent - Talent Protection
	8	Protecting intellectual property rights	Economic	Improving Services - Intellectual Property Rights Management
	9	Anti-corruption and business ethics	Economic	Corporate Governance - Business Ethics
	10	Ecological management of contents	Economic	Improving Services - Content Management
Moderate	11	Energy and resource conservation	Environmental	Promoting Green Ideas - Addressing Climate Change, Green Operations
	12	Low-carbon operations	Environmental	Promoting Green Ideas - Green Operations
	13	Contribution to community/charity	Social	Contributing to society - Community Development
	14	Occupational health	Social	Nurturing Talent - Talent Protection
	15	Supplier sustainability management	Economic	Corporate Governance - Supply Chain Management
Low	16	Effectiveness of board governance	Economic	Corporate Governance - ESG Management, Board Governance
	17	Emission management	Environmental	Promoting Green Ideas - Green Operations

01

Enhancing Corporate Governance



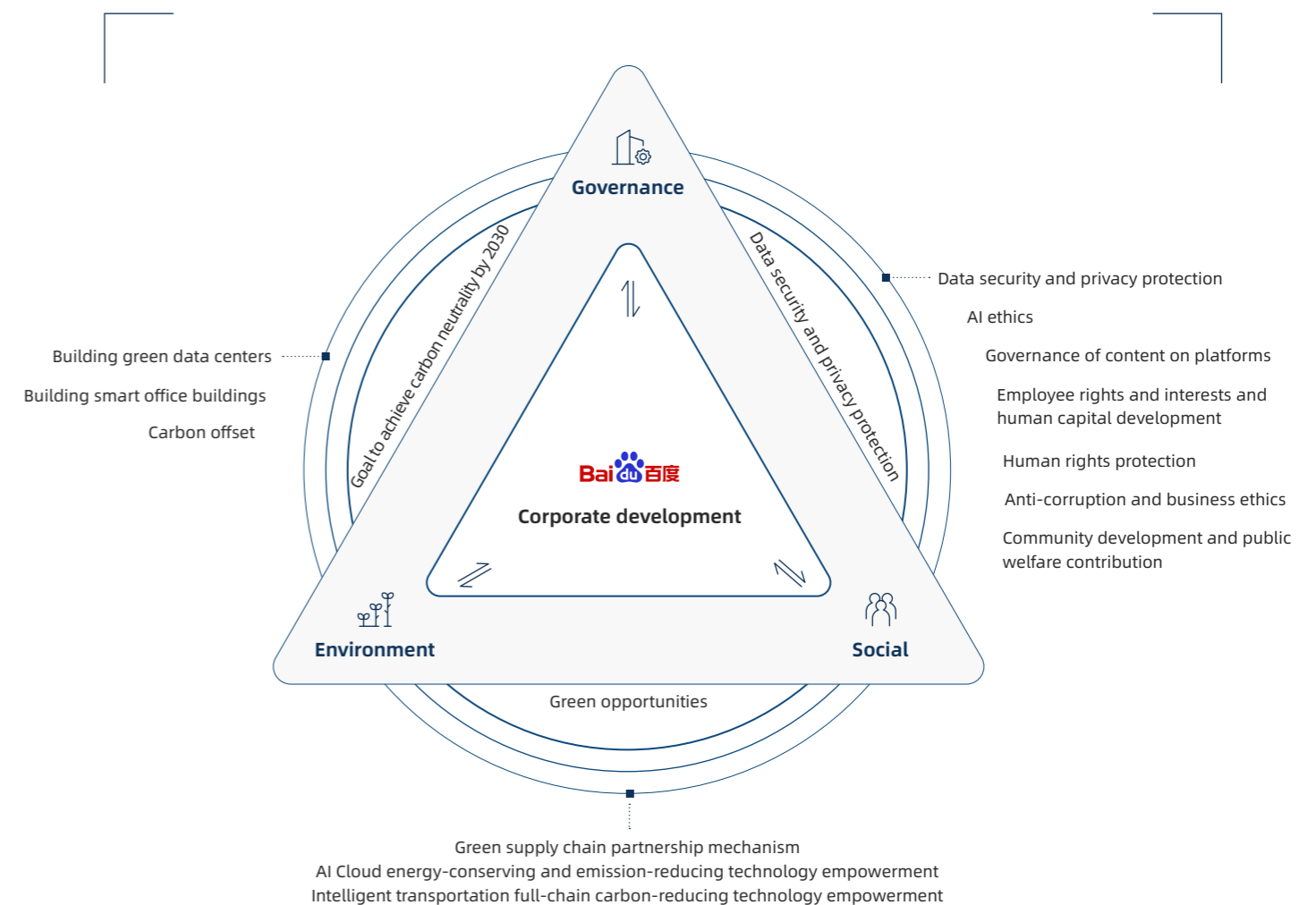
As a leader of the industry, Baidu integrates the concept of sustainable development into decision-making processes and daily operations to keep creating corporate value and build a brighter future with all stakeholders.

1.1

ESG Management

How Does Baidu's ESG Management Serve Corporate Development?

Baidu sets the sustainability of technology, business operations and employees as ESG management goals. We gain insights from the macro environment, business practices and stakeholders to continuously optimize our ESG management models and tools. Focusing on key ESG issues such as data security, privacy protection, carbon neutrality, product quality, human capital, and human rights protection, Baidu continues to identify risks and opportunities in our operations through the cross-business ESG issues working groups. The working groups also collaborate with each other to fully implement the ESG strategic goals and enable the company to create economic and social values to give back to shareholders, users, partners, and other stakeholders.



How Does Baidu Conduct ESG Management?

The Baidu Environmental, Social and Governance (ESG) Policy¹ serves as the basis for the Company's ESG management practices on various ESG issues such as carbon neutrality target management, data security and privacy protection, labor and human rights, product quality and business ethics.

▼

The Board of Directors

- Guiding and approving ESG overarching goals and implementation plans, and ultimately responsible for Baidu's ESG-related matters.

▼

ESG Committee

- Composed of related executives from areas such as finance, legal, HR. ESG goals are included in OKR of these executives and performance result is linked to executive compensation.
- Identifying risks and opportunities based on issues of concern to stakeholders in order to formulate ESG goals and action plans.
- Regularly reporting to and offering suggestions on sustainable development to the Board of Directors.

▼

ESG Working Group

- Composed of professionals, who are distributed to professional groups responsible for carbon neutrality management, data security and privacy protection.
- Gathering resources both internally and externally, as well as working together with relevant departments at Baidu to implement ESG measures and perform specific tasks.

ESG management structure at Baidu

Baidu regularly organizes ESG communication roadshows, which serves as a regular communication mechanism with investors.

Baidu held 11 ESG communication roadshows in 2022 to respond to ESG issues of concern to shareholders, and other related parties, in a timely manner to inform them of related progress.



¹The Baidu Environmental, Social and Governance (ESG) Policy

1.2 Board Governance

How Does the Independence and Professionalism of the Board of Directors Contribute to Baidu's Sustainable Development?

The number of board meetings held in 2022

4

The Board attendance rate

100%

Independence of the Board of Directors

- The Board of Directors is comprised of five directors, four of whom are independent having no converged interests with the controlling shareholder.
- All directors enjoy complete, equal, and independent voting rights in matters such as the Company's business strategy, performance, financial decision-making, risk prevention and control, and conflicts of interest.
- Independent directors are only allowed to provide independent opinions and judgments and any conflicts with personal interests are strictly prohibited.
- Under the Board of Directors, the Audit Committee, Remuneration Committee, Corporate Governance and Nomination Committee have been established. We ensure that the appointment and performance of the duties of the members of each committee meet the requirements on independence.

Professionalism of the Board of Directors

- The appointment of directors is merit-based, so as to ensure that directors have the skills, experience and diverse perspectives required for the job responsibilities.

1.3 Risk Governance

How Does Baidu Prevent Risks?

Baidu formulated the *Baidu Internal Audit Charter* and introduced the "three lines" risk management model, through which the traditional risk prevention model was upgraded to take proactive risk management, and the "three lines" in combination could enable improved identification and management of risks.

The first line

Business departments identify, evaluate, monitor, and manage risks in business operations while providing products and services to customers.

The second line

Personnel in fields such as HR, legal affairs, finance, technology, and security work together to provide expertise and support each other for risk prevention, conduct supervision and raise reasonable questions.

The third line

Such departments as the Internal Audit Department and Professional Ethics Department propose independent and objective opinions on possible risks in each business segment and supervise the improvement process.

Baidu's "three Lines" risk management model

Baidu has carried out various training programs to strengthen the "three lines" risk management model, including induction training, annual presentations, and listing compliance training for the management.

How Does Baidu Accurately Identify and Strictly Control Risks?



For traditional risks

- Conducting audits and tests on related businesses according to the regulatory compliance requirements of the place where a company is listed and where it operates, discovering room for improvement and facilitating rectification;
- Regularly conducting special audits and verification on the business operation data disclosed in the financial report to assess the accuracy and rationality of the data.

For key areas

- Regularly evaluating and inspecting the rationality and effectiveness of process control design in key areas, identifying major process mechanism defects and problems, developing a risk list, as well as facilitating rectification.

For emerging risks

- Conducting the "Business Managers Risk Self-Assessment" to identify ESG-related risk boundaries and facilitate the management to formulate relevant measures.

Baidu evaluates and conducts special audit and risk management work based on issues of concern of stakeholders.

Case: Baidu was Awarded the Title of "Pioneering Practice Case in the Personal Information Protection Compliance Audit"

In 2022, Baidu was won the title of "Pioneering Practice Case in the Personal Information Protection Compliance Audit" from the China Academy of Information and Communications Technology (CAICT) and the Institute of Internal Auditors . This demonstrates that Baidu's proactivity and effectiveness in personal information protection risk audit and governance work has become a benchmark in the industry.



The "Pioneering Practice Case in the Personal Information Protection Compliance Audit" medal

1.4 Transparent Tax Affairs

How Does Baidu Conduct Tax Governance?

Baidu adheres to the principles of honesty and tax compliance. In accordance with laws and regulations, we conduct tax planning and formulate corresponding tax management systems in combination with commercial rationality and business arrangements, and regularly discloses relevant tax information.

1.5 Business Ethics

How Does Baidu Strengthen Business Ethics Management?

Baidu has formulated a set of internal management measures to manage all employees (including full-time employees, part-time employees¹, contractors and interns), institutional contractors, suppliers, subsidiaries as well as type A and B1 ecological companies in areas such as anti-bribery, anti-fraud and anti-corruption, anti-discrimination, information protection, avoiding conflicts of interest, anti-monopoly and anti-unfair competition, anti-money laundering, anti-insider trading, environment, health, safety and reporting.

- Baidu Management Regulation of Construction of Professional Ethics
- Baidu Professional Ethics Reporting Management Regulations
- Baidu Professional Ethics and Code of Conduct
- Baidu Avoiding Conflicts of Interest Policy
- Baidu Management Measures on Undisclosed Material Information and Prohibiting of Insider Trading
- Baidu Management Measures on Business Ethics Red Line
- Baidu Management Measures for Rewards and Punishments
- Baidu Management Measures on Partners Blacklist
- Honest and Integrity Agreement

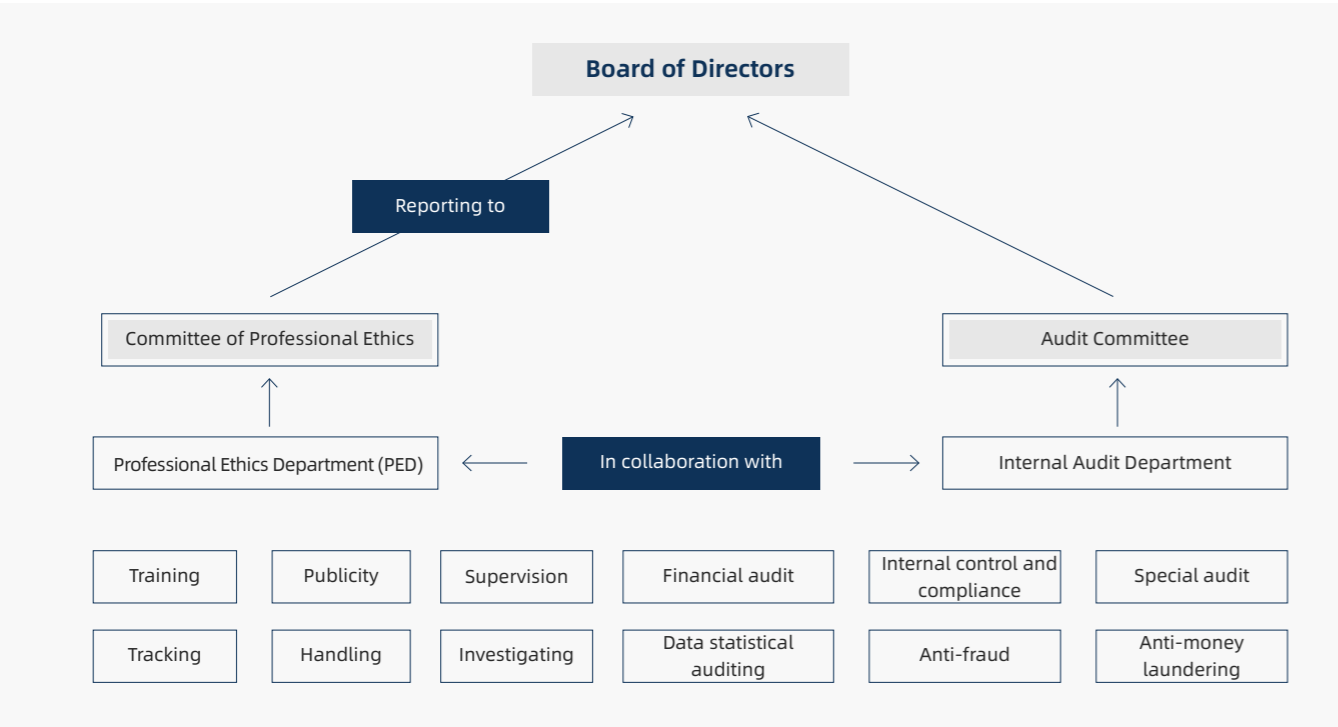
Internal management measures for business ethics²

¹Part-time employees refer to workers who establish labor relations with two or more employers at the same time in a certain period of time.



²The Baidu ESG Policy

Baidu has established a three-level business ethics governance system consisting of the Board of Directors, the Committee of Professional Ethics, and the Professional Ethics Department. The Board of Directors is ultimately responsible for business ethics, the Committee of Professional Ethics is responsible for guiding, supervising, and inspecting the Professional Ethics Department, and the Professional Ethics Department is responsible for implementing specific tasks.



Baidu's business ethics governance framework and reporting levels

The number of business ethics training sessions in 2022

42

Every employee at Baidu is required to uphold business ethics. The employees of the Company, all subsidiaries and type A and B1 ecological companies are required to sign the *Business Ethics and Code of Conduct Commitment Letter*. We provide regular business ethics training for all employees, including position responsibility specific training to deepen their understanding of Baidu's requirements on business ethics. Baidu conducted 21 sessions of business ethics training in 2022.

Employee business ethics training and assessment categories			
Business ethics training and assessment for the newly recruited	✓	Regular business ethics training and assessment	✓
Temporary (targeted) business ethics training	✓	Annual business ethics assessment (compulsory for all)	✓

How Does Baidu Fulfill Commitments to Business Ethics?



Anti-bribery

Baidu adheres to the principle of "fair trade" and prohibits the sale of products through bribery. Any bribes that are secretly collected outside the account, or kickbacks that are given to the other company or individual will be classified as bribery.

Anti-fraud and anti-corruption

Baidu investigates and handles violations of business ethics and disciplines with a "zero tolerance" attitude in order to safeguard the Company's interests, and create a clean workplace environment built on integrity.

Anti-monopoly and anti-unfair competition

Baidu emphasizes battles against monopoly and unfair competition and has established a special compliance system for major monopolistic behaviors such as monopoly agreements, abuse of market dominance, and illegal implementation of concentration of business operators. Taking business operations into account, Baidu has issued compliance guidelines, conducted special compliance assessments, and carried out compliance training and publicity activities. While strengthening internal compliance awareness, Baidu also spreads a competitive compliance concept among users, customers, and suppliers to facilitate fair competition.

Avoiding conflicts of interests

Baidu prohibits any conflicts of interests between individuals and the Company, which applies to all employees, including senior executives.

Reporting and supervising

Baidu welcomes whistle-blowing from employees and people outside of the Company and provides legal advice to whistleblowers. Whistleblowers are encouraged to report the employees' suspected violations of regulations, disciplines, laws, professional ethics, and labor discipline through emails, in-person reports, business ethics suggestion boxes, and letters. Baidu protects the safety of whistleblowers in accordance with the law, keeps the information of whistleblowers strictly confidential, and assigns special personnel to handle the complaints in a centralized manner. No incident of employee whistleblowers experiencing unfair treatment such as dismissal, demotion, suspension, intimidation, and harassment occurred in 2022, nor did any incident of employees retaliating in any form against external whistleblowers.

Audit and certification

In 2022, Baidu once again obtained the ISO 37001 Anti-bribery Management System certification with our outstanding business ethics governance performance.





Experience exchanges in the industry

As a member of the Enterprise Anti-Fraud Alliance and the Trust and Integrity Enterprise Alliance, Baidu proactively pursues industrial exchanges and cooperation, to promote the continuous improvement of business ethics standards in the Internet industry. In 2022, Baidu published the *Baidu's Experience in Constructing Business Ethics and Anti-fraud Supervision System* to provide reference for other companies' anti-fraud compliance management. The publication was nominated as an outstanding innovation project of the third "China Integrity Innovation Award".

1.6 Supply Chain Management

How Does Baidu Effectively Manage Suppliers and Incorporate ESG in the Management?

Baidu has developed regulations such as the *Supplier Management Standards* and the *Supplier Incentives and Punishment Measures* as well as the establishment of a whole-process mechanism for managing suppliers. By leveraging the supplier management system on procurement platforms, Baidu has achieved comprehensive online management of suppliers. The scope of management covers basic information inquiry, classification, performance appraisal to have a real-time understanding of suppliers.

Entry		<ul style="list-style-type: none">Screening candidates.Conducting on-site assessments and interviews with key suppliers with cooperation potentials and inform them of Baidu's ESG requirements.
Cooperation		<ul style="list-style-type: none">Classifying and managing suppliers by different levels based on the categories of products they provide, their region and business operations, and with more efforts made to manage suppliers of products in key categories.Such processes as issuing inquiry, finishing inquiry, bidding evaluation and negotiations are completed on the procurement platform in a unified manner.Holding supplier conferences to inform suppliers of ESG performances and management requirements.
Assessment		<ul style="list-style-type: none">Conducting regular supplier assessment and project evaluation, grading suppliers according to the assessment results, proposing improvement suggestions for failed suppliers and setting time limit for expected rectifications.Points being added to suppliers that effectively manage ESG risks and deducted otherwise.
Exit		<ul style="list-style-type: none">Removing suppliers who fail both the assessment and the rectification.Suppliers who violate national laws and regulations and <i>Baidu's Supplier Management Standards</i>, being dealt according to the <i>Measures on Supplier Reward and Punishment</i>.

The whole-process mechanism for managing suppliers

Number of Chinese suppliers (including Hongkong, Macao and Taiwan)	Number of overseas suppliers
19,766	5,066

Number of suppliers by region ¹

¹ Calculated with the accumulated data in Baidu' s supplier database

How Does Baidu Build a Sustainable Supply Chain?

In 2022, Baidu developed the *Baidu Sustainable Development Principles for Suppliers*¹, in which system, assessment, and training requirements for suppliers on anti-corruption, labor protection, and environmental protection were established. The regulation helps to empower partners with Baidu's sophisticated ESG policies and experience.

Labor protection	<ul style="list-style-type: none">Carrying out on-site due diligence before cooperation with key suppliers.Suppliers are required to provide their internal regulations on the protection of employees' human rights and labor rights as well as records of training for their employees. Failure to provide relevant supporting materials will affect their annual assessment results.
Environmental protection	<ul style="list-style-type: none">Encouraging localized procurement.Prioritizing the procurement of environmentally friendly products
Anti-corruption and anti-unfair competition	<ul style="list-style-type: none">All procurement activities are carried out on the procurement platform with all steps traceable.Regularly conducting spot checks on procurement items and issue reports on the results.Requiring suppliers to provide internal regulations on anti-corruption and records of training for their employees.All suppliers are required to sign the <i>Honesty and Integrity Agreement</i> when signing a procurement contract with Baidu.Establishing a mechanism prohibiting unnecessary contacts with irrelevant parties and a separate mechanism for reporting conflicts of interest.Establishing reporting channels and whistleblower protection mechanisms.Establishing a regular reminder mechanism to remind suppliers to abide by business ethics by email before important festivals.For suppliers who engage behaviors such as commercial bribery, unfair competition will result in the listing them on the blacklist and terminating cooperation with them indefinitely according to the <i>Baidu's Partner Blacklist Management Measures</i>.

In 2022,
100%
suppliers for centralized procurement signed the Honesty and Integrity Agreement.



¹Baidu Sustainable Development Principles for Suppliers

1.7 AI Ethics

What Is Baidu's Understanding of and Commitment to AI Ethics?

Baidu believes that the changes AI brings to the industry, and society as a whole, are ultimately to serve people. AI ethics serves as the foundation of a future intelligent society. Only by developing sophisticated AI ethical norms and proper handling of the relationship between technology and humankind can we obtain more AI dividends and enable technology to benefit mankind.

Robin Li, the founder of Baidu, proposed the following four principles of AI ethics

- AI should be "safe and controllable", which is the highest principle
- AI's innovative vision is to promote more equal access to technologies and abilities for humanity
- the value of AI is to empower mankind to learn and grow instead of surpassing and replacing mankind
- the ultimate ideal of AI is to bring more freedom and possibilities to humankind

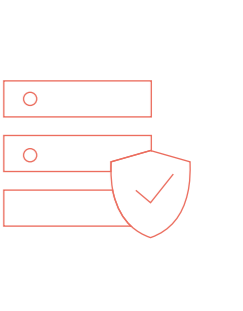
These principles are designed to form a concept and set of rules that the whole society follows for all AI products and technologies, to solve the problem of how AI and human beings can develop harmoniously and sustainably to help create responsible products and designs from the beginning. Hence, Baidu follows the four principles and has proactively established the Technology Ethic Committee, which is equipped with appropriate management mechanism to listen to the opinions of stakeholders, invite experts to participate, and jointly improve Baidu's understanding of AI ethics.

In addition, Baidu is exploring the explainability, transparency and fairness of AI in technologies and products. For example, Baidu has built a complete heterogeneous data set¹ and as an AI open platform, we provide everyone with equal and convenient access to technical capabilities to promote AI equity. Baidu is also making efforts to avoid the problem of information cocoons, continuously improve information recommendation strategies and break down information silos, to present a broader world to users.

Baidu has contributed to the preparation of close to 100 AI safety and ethics standards, covering areas such as algorithms, privacy protection, deep learning, autonomous driving, smart terminals and system services.

¹A collection of multiple relevant databases, where data sharing and transparent access can be achieved.

02 Building Trust



Security and compliance are deeply rooted in the genes of Baidu's business. As we make constant efforts in technical and technological innovation, we always keep in mind users' requirements and expectations for product, data, and privacy security. Standing by our promise "to live up to the trust of every user", Baidu puts users first, and gives them the top priority for security. In addition to a sound security management system, we are upgrading our security technologies and products as part of the efforts to co-build an industrial security ecology.

2.1 Security Management

What Security Principles Does Baidu Uphold?

Overall policy on data security	Legal and rational use, proactive prevention; comprehensive and deep perception, constant optimization and improvement; rapid handling of risk and data security protection.
Data security principles	Principle of legality and compliance, principle of cascade protection, principle of integration of power and responsibility, and principle of constant optimization.
Data security goals	To ensure each piece of data is always effectively protected and legally used.
Security culture	Baidu places significant emphasis on security within corporate culture, treating each employee as a crucial starting point for building a comprehensive security culture featuring a top-down penetration. The Company strives to instill a sense of shared security risk awareness across diverse business lines, establishing consistent and standardized security service practices. By empowering business security, Baidu aims to generate value for users while also fostering a sense of safety and respect.

Security Philosophy

How Does Baidu Ensure Security Management System Functions Well?

System level

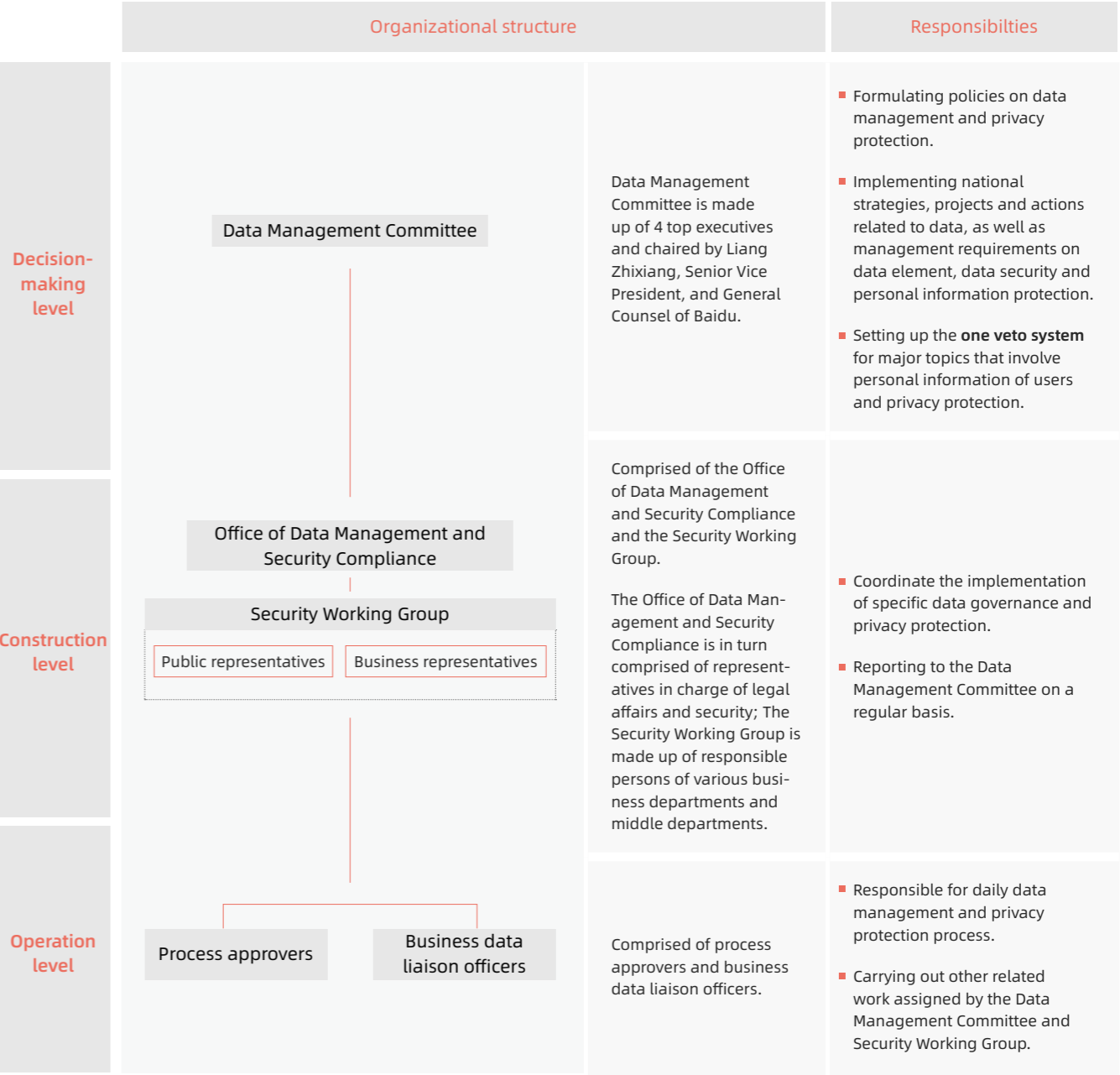
Baidu has established a sound security system¹ and a strict process of system review, release, and revision. The system covers areas including security red line, office red line, basic security, data security and privacy protection, product security, third-party cooperation security, and security management.

Organization level

The Data Management Committee of Baidu², as the highest level of management and decision-making at Baidu, works closely with both construction and operation levels to fulfill their responsibility of safeguarding the security interests and rights of our employees, users, customers, and ecosystem partners. Baidu is committed to ensuring that all of products and services adhere to applicable laws and regulations pertaining to network security, data security, and privacy protection. Additionally, in accordance with the *Personal Information Protection Law of the People's Republic of China*, Baidu has designated a responsible individual for overseeing personal information protection.

Management level

Security-related-OKRs have been established for senior executives and employees holding security-related positions at the Company. These OKRs relate to specific security indicators, such as emergency effectiveness, security capacity coverage, risk active discovery rate, and completion rate of early warnings.



Security management organization and responsibilities



¹For details, refer to the Baidu ESG official website



²Baidu Privacy Protection Platform (baidu.com)

2.2 Security Guarantee

How Does Baidu Guarantee the Basic Security in a Holistic Manner?

Infrastructure security

The *Security Management System of Baidu Data Center* covering physical security, personal security, and information security, has been established to guarantee the safe, stable operation of Baidu Data Center.

Cybersecurity

Full-flow protection IDS, host IDS, WAF system, firewall, anti-virus software, white box audit, and black box scanning systems are deployed at the network zone boundaries, as well as on the application layer, database layer and host layer for effective identification of and protection against external attacks.

Code security

Strict code management authorities have been set up and security coding guide has been prepared to regulate coding and enhance code security.

Cloud security

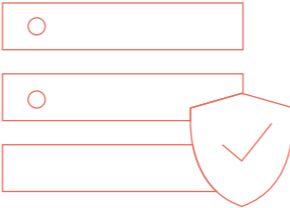
Baidu Cloud Security takes AI as core and big data and machine learning as the foundation to build a defense-in-depth system.

- Cloud network: The intelligent threat-hunting platform¹ is adopted to guarantee the security of customer's data assets on the cloud.
- Cloud security: HOSTEYE cloud server security protection product² is used to comprehensively improve the cloud server security.
- Data security: Complete data security schemes and key products like intelligent data security gateway are provided to improve the overall data security management capabilities of users.

Product security

Baidu has incorporated the data security and privacy protection measures into product and service development.

- Before the launch of each product (including each iteration): They must undergo tests of the Springer testing platform, federal multi-party security computing, and privacy benchmark test.
- After the launch of each product: They must go through security hole scanning. The Security Department and the Business Department will jointly follow up the hole repairing through the handling platform for uniform security hole operation & maintenance. The product then goes through internal security evaluation before accessing third-party SDK.



How Does Baidu Improve Emergency Response Capability in Case of Security Events?

Baidu follows systems and regulations including the *General Rule on Handling of Security Issues of Baidu* and *Detailed Rules on Handling of Security Events of Baidu* and has established the handling and responding process for security emergencies with a multi-layer network exception defense system¹ as the foundation. Meanwhile, Baidu has established a 24/7 security emergency response team to respond to security events such as zero-day hole² emergency in an effective manner. In 2022, Baidu revised related rules and regulations by adding a handling process of security issues related to mobile privacy compliance.

01 Confirming the emergency and stopping loss	The emergency response team, after confirming the security event, will immediately contact related business departments to handle the emergency and stop loss without delay.
02 Taking joint action and reporting	Communicate with overseeing authorities through the joint action and reporting system to detect holes.
03 Classification and notification	Evaluate the extent of the damage caused by the security event and notifies relevant personnel of the incident's progression, based on log analysis and inspection on intrusion and information leakage.
04 Follow-up and rectification	The business departments make rectification in a timely manner. The Security Department follows up the rectifications.

Security emergency response processes

How Does Baidu Guarantee the Security Business Drawing on Advantages in Technology?

Baidu has set up an AI security research team based on three dimensions: Security, Safety and Privacy.³ Utilizing extensive AI products and eco-system, Baidu has made arrangements in frontier technology fields including hole attack and defense, security intelligence, security test and privacy computing, developed and deployed a multi-layer security protection scheme and built up a leading, AI native cloud-oriented security technology system.

Case: ERNIE Increases Baidu's Data Security Capacity

ERNIE, independently developed by Baidu, is used in place of the traditional data classification technique to realize automatic, class-based management of data, thus greatly improving the efficiency and effect of Baidu's data security governance. Moreover, ERNIE integrates AI technology for automatic identification and anonymizing of people's names through masking. Automatic, precise masking is used on sensitive information in pictures including human faces and car plate numbers, with the use of technologies such as deep learning, target detection and OCR.



¹ The intelligent threat-hunting platform



² HOSTEYE cloud server security protection products



¹ For details, refer to Page 35 of Baidu's Environmental, Social and Governance (ESG) Report 2020.

² Zero-day, also known as zero-day attack, is a security vulnerability that is immediately utilized for malicious purpose upon discovery.



³ For details, refer to Page 17 of Baidu's Special Report on Data Security, Privacy Protection and Content Governance 2020.

Case: Baidu Launched the First AI Face-changing Detection Tool

Baidu is using state-of-the-art technology to cope with emerging security challenges. To cope with potential security hazards, legal risks and social issues resulting from "AI face-changing", Baidu opened the source of the first AI face-changing detection tool in the industry. This tool is able to identify deep-fake and face synthesis with the use of testing methods including facial features and facial margins, with an accuracy of 99%. This helps the regulating authority stop the illegal use of AI face-changing techniques as a means of telecom network fraud from the source.

Security verification

The security protection measures of Baidu are widely recognized both domestically and internationally. A number of products have been given security qualification certificates by global authoritative organizations.

Baidu's AI Cloud

- DSMM data security capacity maturity model (class 4)
- IPv6 Enabled CDN Logo
- ISO 27001 Information Security Management System Certification
- ISO 27017 Security Management System Certification
- ISO 27018 Personal Information Protection Management Certification
- ISO 27032 Cyberspace Security Guide Certification
- ISO 27040 Storage Security Practical Guide Certification
- ISO 27701 Privacy Security Management System Certification
- ISO 29151 Personal Data Privacy Protection Management System Certification
- CSA-STAR Cloud Security International Certification

Xiaodu

- ISO 27001 Information Security Management System Certification
- ISO 27701 Privacy Information Management System Certification
- ISO 27018 Public Cloud Personal Information Protection Management System Certification
- Information system security classification protection (class 3)
- Pilot demonstration certification project of national standard on personal information protection of intelligent household electrical appliance

Baidu Netdisk

- ISO 27001 Information Security Management System Certification
- ISO 27018 Personal Information Protection Management Certification
- ISO 27701 Privacy Security Management System Certification

Case: Baidu Advertisement and Baidu Map SDK Passed a Number of Security Tests

In June 2022, Baidu Mobile Advertisement SDK passed the test of the Safety and Police Electronic Product Quality Testing Center of the Ministry of Public Security. The test results were compliant in 11 tests including SDK security reinforcing, data storage security, personal information processing rules, personal information processing rules, protection of personal information subject rights. In July 2022, Baidu Mobile Advertisement, Baidu Maps Android, and Baidu iOS location SDK for both PC and mobile ends passed the product test under the "Special SDK Security Program" launched by the Security Research Institute of China Academy of Information and Communications Technology and was given the "SDK Security Special Test Certificate".

Baidu Mobile Advertisement given the "SDK Security Special Test Certificate"



Baidu Map granted the "SDK Security Special Test Certificate"

In 2022, Baidu was granted

18

security-related awards

Honors and Awards

- Named in the "Cloud Native Product Catalogue" of 2022¹
- Outstanding Contributor of Face Protection Program⁴
- Outstanding Case of Children Protection Program²
- Active Co-organizer of the Data Security Community Program⁵
- 2022 Big Data "Galaxy" Outstanding Case³

Security awards (not all-inclusive)

¹The application of two products, namely "Baidu Intelligent Data Security Gateway" and "Baidu Host Security Management System" was successfully submitted and they were selected into the first batch of "Cloud-Native Product Catalog" by China Academy of Information and Communications Technology (CAICT), helping users choose cloud-native models.

²Baidu Xirang App project was awarded the "Excellent Case of Minors' Network Literacy Enhancement" by the China Academy of Information and Communication Technology's Child Protection Program as the first meta-universe rule of law education base for minors in China.

³For details, refer to the case of "Baidu Selected as the Big Data 'Galaxy' Case in 2022 - 'Excellent Case of Privacy Computing'".

⁴For details, refer to the case of "Baidu launched the first AI face-changing detection tool".

⁵At the end of 2021, the China Academy of Information and Communications Technology, together with over 60 universities, scientific research institutes, enterprises, and institutions, jointly launched the "Data Security Community Program" and carried out various work in the field of data security. Baidu, which became one of the initial member organizations in November 2021, has actively participated in external discussions and applied data security-related cases multiple times since joining the program, and has been awarded the title of the "Active Assistance Company" in the Data Security Community Program in 2022.

Case: Baidu Named in Gartner's Hype Cycle™ for Security in China, 2022

In November 2022, Gartner®, an international consulting and analysis agency, officially released the "Hype Cycle™ for Security in China, 2022". In recognition of our multi-dimension influence in the industry in data security and privacy protection technology, Baidu was named in the Report as the representative supplier of Confidential Computing and Secure Multiparty Computation (SMPC). This highlighted the influence of Baidu in data security and privacy protection technology.

Audit and verification

Baidu carries out security audits on a regular basis to guarantee the effectiveness and reliability of our security management system. The Internal Audit Department carries out risk-based evaluation and audit on personal information data and high-sensitivity data. Meanwhile, Baidu appoints third-party organizations with professional qualifications to carry out related audit certification and security evaluation annually.

Case: Baidu AI Cloud was Equipped with SOC¹ Verification Report

Baidu's AI Cloud boasts a robust internal control system and world-leading security management and control capabilities. Its security measures span various areas, such as data security and information lifecycle management, infrastructure and virtualization security, hole security, security events, and failure management. Baidu AI Cloud has received SOC1 Type2, SOC2 Type2 (safety, confidentiality, availability, and privacy), and SOC3 verification reports, which is capable of implementing the most stringent security regulations and privacy protection and control measures in the industry. It is also able to meet users' protection requirements in various aspects, including business security, data security, operation security, and basic security, and effectively handle threats such as cyber-attacks and data leakage.



¹ The SOC (System and Organization Controls) standard is an industry service standard developed by the American Institute of Certified Public Accountants (AICPA) and focuses on the internal control system and security control process of cloud service providers. This standard has been widely recognized at home and abroad and is an important reference for enterprises to evaluate their relevant qualifications and service quality when selecting third-party cloud service providers.

What Efforts Do Baidu Make to Build Team of Security Talent?

In order to improve the quality and skills of security personnel, and perfect the personal knowledge system, Baidu launched the Security Personnel Qualification Program in 2021.

As of 2022, Baidu had implemented four phases of Security Personnel Qualification Program, including Certification for Cyber Security Competence (CCSC), Certified Information Security Professional (CISP), and Data Security Officer (DSO) that covers more than 40 employees in security positions. This has greatly contributed to internal training of high-end talent in the data security field and helped us build a security line.

What Will Baidu Do for the Industry and the Community with Remarkable Security Capacity?

Security standards

Baidu is proactively increasing the security protection consciousness across the industry and the community, as well as improving the standardization level. Up to now, Baidu has participated in the drafting of 320 security-related standards, including 11 international standards, 89 national standards, 108 industrial standards, 110 group standards and 1 local standard. In 2022 alone, Baidu participated in the development of nearly 200 security-related standards.

Baidu worked with other organizations to lead, or participate in the preparation of a number of white papers, blue books and research reports, including *Privacy Computing White Paper 2022*, *Research Report on Trusted Privacy Computation*, and *Research Report on Federal Learning Scenario Application*.

Baidu has followed up

320

safety standards in total

including

11

international standards

89

national standards

Name	Nature	Technical Committee
<i>ISO/IEC 27035-1 : Information technology-Security techniques-Information security incident management</i>	International Standards	ISO/IEC JTC 1/SC 27 Information Security, Cybersecurity and Privacy Protection (ISO/IEC JTC1/SC27)
<i>Standard for Security Requirement of Privacy-preserving computation</i>	International Standards	Institute of Electrical and Electronics Engineers (IEEE SA)
<i>Information Security Technology--Guidelines for SDK Security in Mobile Internet Applications</i>	National Standards	National Information Security Standardization Technical Committee (TC260)
<i>Information Security Technology--Requirements of Privacy Policy of Internet Platforms, Products and Services</i>	National Standards	National Information Security Standardization Technical Committee (TC260)
<i>Evaluation Index of Internet Enterprises to Prevent and Govern Telecommunication Network Fraud</i>	Industrial Standards	China Communications Standards Association (CCSA)
<i>Privacy Computing--Application Specification for Higher Education Digitalization Scenarios</i>	Group Standards	China Communications Standards Association (CCSA)
<i>Evaluation Index of Social Responsibility for Corporate Data Security and Personal Information Protection</i>	Group Standards	China Cybersecurity Industry Alliance

Security standards with Baidu as a drafter

Industry alliance

Actively participating in industry alliances, Baidu has currently joined 50 industry associations, including the Artificial Intelligence Industry Alliance (AIIA), Privacy Computing Alliance, and China Cybersecurity Industry Alliance (CCIA).

<div>Artificial Intelligence Industry Alliance (AIIA)</div> <div>Sponsor</div>	<div>China Cyber Security Industry Innovation and Development Alliance</div> <div>Executive Director</div>
<div>X-Reality and Metaverse Industry Alliance (XRMA)</div> <div>Deputy Director</div>	<div>Telecommunication Terminal Industry Forum Association (TAF)</div> <div>Director</div>
<div>Privacy Computing Alliance</div> <div>Deputy Director</div>	<div>Cyber Security Association of China (CSAC)</div> <div>Deputy Director</div>
<div>China Cybersecurity Industry Alliance (CCIA)</div> <div>Member</div>	<div>China Communications Standards Association (CCSA)</div> <div>Member</div>

Participation and Formation of Industry Alliance

Scientific research projects

In 2022, Baidu collaborated with external partners to conduct research on security and privacy protection projects, which included four national scientific research projects and one university-based technological cooperation project. Notably, Baidu successfully completed the national scientific research project titled "Artificial Intelligence Data Security Risk Detection and Verification Service Platform for Industrial Internet."

<div>National scientific research projects</div> <div><div>◦ 2020 Industrial Internet Innovation and Development Project of Ministry of Industry and Information Technology of the People's Republic of China– "Artificial Intelligence Data Security Risk Detection and Verification Service Platform for Industrial Internet"</div><div>◦ 14th Five-Year Key Special Project of the Ministry of Science and Technology in 2021-Key Special Project of "Cybersecurity Space Governance"- 2.5 Analysis and Detection Technology and Application Demonstration of Mobile Application Privacy Phone Behavior</div><div>◦ Key Project of 2030 "New-generation Artificial Intelligence" Project for 2021 Science and Technology Innovation - 2.6 Machine Learning Technology under Data Security and Privacy Protection</div><div>◦ Special Public Service Platform of the Ministry of Industry and Information Technology for the Reconstruction of Industrial Base and High-quality Development of Manufacturing Industry in 2022 - Industrial Technology Base Platform</div></div>
<div>University-based technical cooperation</div> <div><div>◦ Technical Services to Mobile Application Users for Explicit Compliance Detection</div></div>

Participation in scientific research projects

2.3 Personal Information and Privacy Protection

What Personal Information, Privacy Protection Principles and Systems Does Baidu Follow?

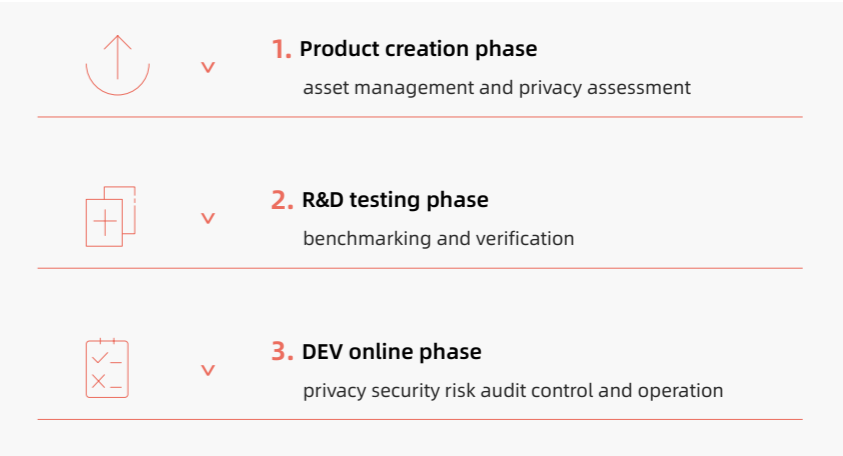
Adhering to the four privacy protection principles of "informed consent, minimum sufficiency, user experience and security guarantee"¹, Baidu protects users with the right to know, choose, control, access, modify and delete personal information while providing users with a high-quality experience².

Baidu has developed a complete privacy policy system to inform users of Baidu's treatment and protection principles for personal information and privacy through *the General Principles of Baidu Privacy Protection* covering all business lines and individual privacy policies for various products (such as Baidu App, Xiaodu, Baidu Map and Baidu Netdisk).

How Does Baidu Realize Technology Application and Empowerment in Privacy Protection?

Baidu places great emphasis on safeguarding the data security and privacy of the entire chain of AI technology and AI training, starting from privacy protection design to privacy enhancement technology. To this end, we have developed our own "device-cloud" privacy data security protection solution called T3, which employs confidential computing technology across all sensitive data processing links in devices, edges, and clouds. This ensures device-to-device security and trustworthiness at the device, edge and cloud level.

Furthermore, we encrypt all data and models used in the AI training process during transmission, storage, and use. This provides data processors with the ability to demonstrate their innocence, which is crucial in maintaining the trust of users. We have improved our internal "privacy security engineering" ability with AI technology to embed personal information protection, privacy protection and data security compliance requirements into the full life cycle of product development and testing. In addition, we comprehensively test the privacy protection level of products with industry-leading detection tools and technologies to systematically solve privacy and security risks.



¹ For details, refer to Page 40 of Baidu's Environmental, Social and Governance (ESG) Report 2020.
² For details, refer to "Trust and Commitment - 06" of Baidu's Environmental, Social and Governance (ESG) Report 2021.

How Does Baidu Strengthen the Privacy Security of Minors?

Baidu has been committed to integrating measures for protecting the minors into various products and services for a long time¹, such as creating a protection system for minors to protect their healthy growth. The voice assistant for Xiaodu Watch was selected as the 2022 "Child Care Plan" of the China Academy of Information and Communications Technology - Excellent Case of Children's Personal Information Protection in App in June 2022.

Case: Xiaodu App Protects the Healthy Growth of Children

The DuerOS² device has a special children mode to better promote the healthy growth of children and effectively protect children's privacy and personal information security. The DuerOS device will be used under certain restrictions when in child mode, such as the time of use, available skills and content. Guardians can manage children's use of content on the device and time of use through Xiaodu App as well as other devices.

To assist guardians in better understanding and managing their children's device use in child mode, Xiaodu App has been designed to provide easy access to children's privacy protocols. Upon the first use of Xiaodu App, guardians are presented with the content of this privacy protocol. Additionally, the content page of the protocol is easily accessible after the second jump of "My - About Xiaodu". Furthermore, Xiaodu App reinforces the parent recognition mechanism in the "entry" and "exit" design of child mode. Once parents enter child mode through settings, Xiaodu App will remain in child mode unless it is unlocked and exited by parents. This strengthens the security of child mode and ensures that parents have control over their children's device use.



Interface of Xiaodu's Children's Privacy Agreement



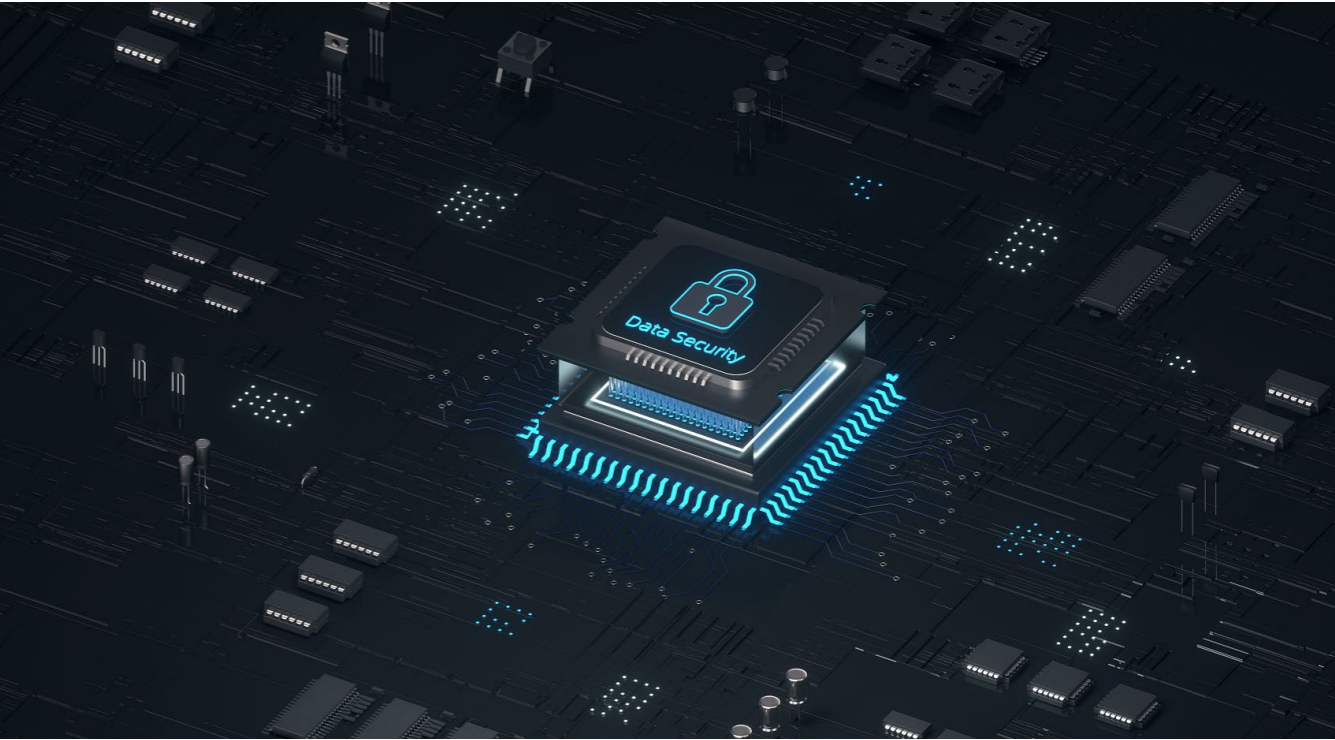
¹For details, refer to Baidu's Children Personal Information Protection Statement.

²DuerOS is a conversational AI system developed by Baidu, which is carried on Xiaodu and can realize information query, life service and other functions in different scenarios through natural language dialogue interaction.

How Does Baidu Help Improve the Privacy Protection Ability of Stakeholders?

Baidu has continuously consolidated the bottom line of security and responded to the expectations of various stakeholders for privacy protection in a holistic way through internal empowerment training and external ecological construction.

Employees	<ul style="list-style-type: none">Training for all employees: Baidu provides privacy protection and data security training for all employees with 100% new employees included, and a total of 1,073 junior managers have completed credit courses on data management and security compliance.Special activities: Baidu organized activities such as "Personal Information Protection Publicity Month" and "Security Publicity Month" in 2022 to improve employees' awareness of data security and privacy protection.
Suppliers	<ul style="list-style-type: none">Baidu provides free resources and course training services related to data security and privacy protection to stakeholders such as contractors, suppliers, and outsource employees.Baidu established a data and privacy security assessment and punishment mechanism.
Partners	<ul style="list-style-type: none">Due diligence of data privacy: Baidu strictly requires the third-party partners to provide relevant documents such as security qualifications, data sources, proof of compliance, and security certificates (for example, ISO certificates).Compliance and security access assessment: Third-party SDK is introduced for Baidu Apps to carry out a complete security assessment process.¹



¹ For details, refer to "Trust and Commitment - 03" of Baidu's Environmental, Social and Governance (ESG) Report 2021.

Case: Three Functions of the Hotel Version of Xiaodu to Protect the Privacy Security of Guests

Designed without camera to eliminate the possibility of surveillance

The hotel version of the Xiaodu smart speaker has no camera and does not collect any video image content.

Exclusive activation tool without need to log in personal account

The hotel version of the Xiaodu smart speaker provides an exclusive activation tool, and can work normally without logging in the personal account by hotel guests to protect their personal information and privacy security.

Automatic reset of the device after check-out

The Xiaodu smart speaker installed in hotels comes with a "reset" feature that automatically activates the "reset" function in the hotel management system once a guest checks out. This allows the device to revert to the original state with a single click, effectively erasing all interaction records on the Xiaodu speaker to ensure guest privacy and security.

Case: Baidu Apollo Becomes the First Tier 1 to Pass the Test and Verification for Intelligent Driving Data Masking Products in China

In 2022, the intelligent driving video and image anonymous processing system (hereinafter referred to as the "intelligent driving data masking product") of Baidu Apollo has passed the test of *Technical Requirements and Methods for Automobile Transmission Video and Image Masking* in Shanghai Auto Test Center, becoming the first intelligent driving supplier in China to complete the test.

Baidu Apollo integrated the module of intelligent driving data masking product into the intelligent driving system, enabling the anonymous processing of intelligent driving video and image data at the car end, which provides an important reference direction for the personal privacy and data protection path in the process of data collection, storage, and processing in the automobile industry.

Case: Baidu Selected as the Big Data "Galaxy" Case in 2022¹ - "Excellent Case of Privacy Computing"

Baidu Dianshi was selected as an excellent case of Big Data "Galaxy" Case in 2022 by virtue of the leading technology and perfect application system in the scenario of government public data opening. Baidu leveraged privacy computing technology by utilizing a data security sandbox platform to enable the secure opening and modeling of government data. This approach offers technical support for achieving collaborative sharing of internal government data, enhances the efficiency of government affairs processing, and rejuvenates government data resources. Furthermore, it provides a novel solution to address the challenges of safeguarding personal privacy and data protection during social digital transformation.



Honor Certificate of "Excellent Case of Privacy Computing" of "Galaxy" Case in 2022

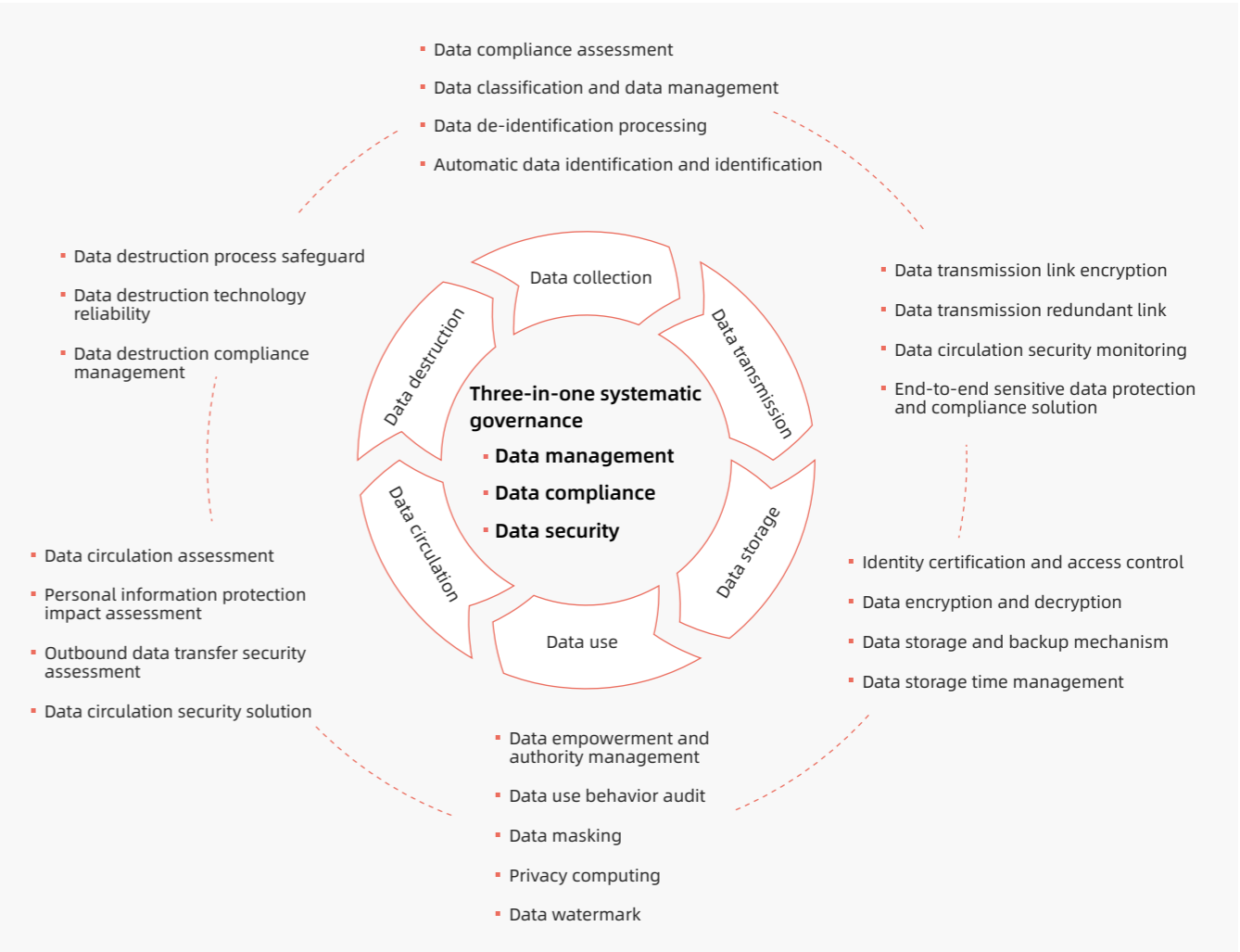
¹ The Big Data "Galaxy" Case Collection Event 2022 was jointly organized by the China Academy of Information and Communications Technology and the China Communications Standards Association Big Data Technology Standards Promotion Committee (CCSA TC601) and aims to promote the development of big data technology products and related industries, accelerate the cultivation of data element markets, and establish industry benchmarking force.

2.4 Data Governance and Algorithm Governance

How Does Baidu Achieve Safe and Effective Data Governance?

Baidu has established a complete data governance system, such as *Baidu Data Management Measures*, *Baidu Data Circulation Specification*, *Baidu Data Classification Specification*, *Baidu Data Authority Management Specification* and *Baidu Virtual Resources Management Specification*, to enhance the standardization and effectiveness of data governance. Meanwhile, Baidu regularly updates and optimizes the management system and process, improves the efficiency of data evaluation, approval, and circulation, reduces the comprehension difficulty of users, and achieves win-win results for all parties involved.

In addition, Baidu has developed a data security and privacy protection solution covering the entire life cycle of data, including all links from data collection, transmission, storage, use, circulation to destruction, and applied it in the self-developed products and platforms, establishing a data full life cycle security management mechanism of "proactive identification in advance, flexible control in the process and all-dimensional tracking afterwards". Baidu adopts methods including entire life cycle management, personal information protection impact assessment (PIA), data circulation assessment and approval, strict protection of key information and core data, classification management, masking transmission, encrypted storage, personal information list and security event management to strengthen data security governance.



Data full life cycle security management mechanism

How Does Baidu Prevent and Control Outbound Data Transfer Risk?

Baidu strictly adheres to the the *Cyber Security Law of the People's Republic of China*, the *Data Security Law of the People's Republic of China* and the *Personal Information Protection Law of the People's Republic of China*, as well as other relevant laws and regulations. In response to the release of the *Measures for the Security Assessment of Outbound Data Transfer*, led by the Data Management Committee, Baidu collaborated with relevant departments to establish a dedicated task force to rigorously enforce the applicable standards and requirements for outbound data transfer. This involves developing a self-examination and evaluation plan for outbound data transfer, conducting regular checks and corrections on outbound data transfer practices, and consistently enhancing Baidu's ability to comply with the standards and regulations for outbound data transfer.

Baidu has developed the *Outbound Data Transfer Security Management System* for Baidu Group as part of system construction efforts. This system establishes clear guidelines and regulations for Baidu's outbound data transfer activities, with the goal of upholding national security and social public safety, protecting the rights and interests of personal information subjects, fulfilling legal responsibilities and obligations, and safeguarding the data security and lawful rights and interests of Baidu.

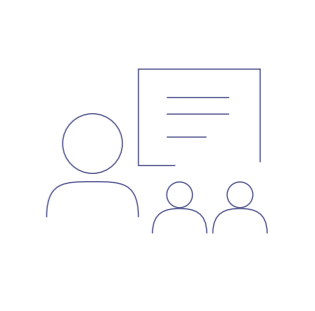
In technological development, on the basis of regular data security risk assessment, Baidu gives full play to its accumulation and advantage in the field of security technology for years, combines with industry-leading outbound data transfer compliance detection technology, forms closed-loop risk management and control, and constantly consolidates and improves the effect of outbound data transfer risk management.

How Does Baidu Understand and Practice "Responsible Algorithms"?

Baidu remains committed to promoting responsible AI technology and responsible algorithms. To govern algorithm models, Baidu takes measures to filter out harmful information and discriminatory content at the upstream source. Baidu also conducts internal verification and calibration during algorithm model training to ensure fairness, which is further confirmed through internal evaluation, pre-online verification, and user surveys after algorithmic results are recommended. Additionally, various security technologies are embedded throughout the entire life cycle of algorithm model governance to ensure user data security and personal privacy at every level. At Baidu, every technological innovation is rooted in the concept of "responsible algorithms", which is also the shared goal and mission of all Baidu employees.



03
Nurturing Talent



Upholding the concept of "selecting the best candidates, offering the largest growth space, focusing on the final results and recognizing the outstanding employers" in managing talent, Baidu recruits talented personnel and integrates diversity, and enables them to grow together with the company.

3.1

Talent First

What Is Baidu's Talent Structure?

Indicator	Category	Unit	2021	2022
Number of Employees	/	Person	36,413	34,798
Number of employees by gender	Male	Person	22,109	21,412
	Female	Person	14,304	13,386
Number of employees by age	30 and below	Person	20,080	17,690
	31-40	Person	15,019	15,398
	41 and above	Person	1,314	1,710
Number of employees by rank	Senior manager	Person	20	20
	Middle manager	Person	234	212
	General staff	Person	36,159	34,566
Employee turnover rate by gender	Male	%	/	30.2
	Female	%	/	28.6
Employee turnover rate by age	30 and below	%	30.5	32.3
	31-40	%	20.0	26.2
	41 and above	%	17.0	31.9
Temporary worker	Part-time employees	%	/	4.4
	Contractors/consultants	%	/	0.01

Employee structure

How Does Baidu Select and Retain Talent?

Baidu develops sophisticated and efficient talent selection and retention strategies by leveraging multiple tools and platforms.

- **AI Scholars Pool:** Selecting and retaining 500,000 candidates to facilitate AI development at Baidu;
- **Tools for talent planning & analysis:** Completing the analysis of talent allocation by leveraging talent inventory, talent portrait, talent-organizational goal matching analysis and other technologies to, thus improving talent recruitment;
- **Intelligent recruitment system:** Using self-developed intelligent recruitment system to analyze changes in talent demands, informing recruitment decisions.



Case: Baidu Leverages AI Technologies in On-campus Recruitment

On-campus recruitment is a major channel for us to find and select talent. Baidu put the self-developed Smart Campus Hiring (SCH) system into operation, where such features as smart position recommendation, written tests and interviews are integrated. With the collaboration of HR experts and the AI system, desirable candidates were swiftly screened out. SCH system has covered 92.74% of the 2000-plus successful candidates we recruited through on-campus hiring in 2022. This demonstrates that objectivity and fairness were assured throughout the whole recruitment processes.

Baidu has rolled out multiple special campus recruitment programs to attract top innovative talent in the AI era.

- **The Management Trainee Program:** to train competent managers for technological innovation enterprises in the AI era;
- **The Campus AIDU Program:** open to top talent suitable for technical and product related positions;
- **The Green Channel Program:** open to exceptional performers in such competitions and campus activities as Baidu Star, front-end developer bootcamps and technical lectures.

Case: Baidu Launches the Campus AIDU Program

The Campus AIDU Program is designed to attract top AI talent. In practice, Baidu, taking talent demands into account, also reserved potential technical talents in AI research. The number of resumes received through the program in 2022 saw an annual increase of 196.5% with a larger share of the resumes from PhD candidates.

What Talent Growth Mechanisms Does Baidu Provide?

Baidu further optimizes job promotion schemes and career development channels, encourages cross-level and exceptive promotion, and offers varied development channels and internal transfer opportunities, so as to provide employees with internal stimulation and accelerate their growth.

- **Mentor Du:** As a mentor for the newly recruited, Mentor Du conveys basic work methodologies, prudent work attitude and beliefs to them, so as to enable employees to grow rapidly in a holistic way.
- **Career development sequences:** Baidu provides two major career paths - technical and managerial, for employees with different professional backgrounds. Categorized TPE¹ sequences are offered based on the functions of different positions.
- **Talent inventory program:** Analyzing the match degree between employees and organizations by evaluating employees' dimensions such as performance and ability. Developing talent development and cultivation plans based on the results of the analysis so as to build strategies for diverse talent development and promotion.
- **OKR performance management structure:** In conducting employees' performance coaching and goal reviews, Baidu leverages the OKR² performance management structure. In addition, a performance appeal mechanism has been established to further ensure the objectivity and fairness of performance results.³

Baidu is well-known for the vast training opportunities offered to employees. Baidu continued improving the *Baidu Training Management Standard* in 2022 and provided a vast sea of training courses and self-growth channels for all employees (full-time employees and part-time employees), so as to facilitate growth as an "organization with sound learning atmosphere".



What Training Opportunities Does Baidu Provide Talents With?

The number of new courses on "Duxuetang"

4,557

The number of live training courses

1,992

The percentage of content created by employees

28%

The number of online and offline training sessions

380

The number of self-developed courses

600

The number of technical lectures

120

Internal Learning Platform: Duxuetang

Baidu continually improves the "Duxuetang" platform and encourages employees to proactively share knowledge and experience on it, contributing to the company and society at large whilst boosting their professional proficiency. A total of 4,557 courses were added and 1,992 live training courses, an average of 8 per working day, were conducted in 2022. Among the online courses, 28% of the content was created by employees.

General Competency Training: The Mini Capsule Program

The Mini Capsule program is designed to enhance employees' skills in five aspects: growth, thinking, motivation, coaching, and influence. The program helps them to address their headaches in daily work while improving organizational effectiveness, benefiting both the employees and company.

Professional Training: BIT

Putting our concept of "AI-empowered Education" into practice, Baidu has constructed the Baidu Institute of Technology (BIT) platform to design customized career development training courses for employees. In 2022, BIT conducted over 380 training sessions, online or in-person, with over 600 self-developed courses provided. Over 30,000 participants have undertaken the trainings throughout year with a satisfaction rate of 92%.

In addition, Baidu has provided technical lectures such as Tech Talk, Research Talk, Dandelion Seminar, and Baipinhui for employees on a regular basis, covering a variety of hot topics including advances in cutting-edge technologies, product methodology and industry trends. The Dandelion Seminar, which was specially designed for employees within the "T" sequence, helps employees to enhance their professional capabilities, and facilitates communication and exchanges among them. In 2022, over 120 such lectures were provided with an attendance of over 100,000 person-times.



¹ TPE refers to T (R&D), P (Product) and E (Solutions and Services for Governments and Enterprises) sequences. For more details, see Baidu Special Report on Human Capital 2020.

² OKRs, or Objectives and Key Results, conceptualized by Andy Grove, former CEO of Intel, is a set of popular management tools and methodologies for tracking targets and performances.

³ For more details, see page 35, Baidu Special Report on Human Capital 2020.

Management Trainee Training

Senior management mentorship

- Trained by senior executives
- Rotating between two or three core departments

Rapid growth channel

- Accelerating young employees' growth
- Building a holistic growth channel for young managers

Creating development plans

- Exploring key business development directions
- Gaining technical and product insights
- Taking courses that train leadership, general competency, and common skills
- Cultivating and enhancing insights, creativity, business mentality, awareness in collaboration, win-win cooperation, and team management capabilities

Case: Management Trainee Programs Help Cultivating Innovative Leaders

In 2022, Baidu organized various training activities such as the "Innovation Bootcamp" for newly recruited management trainees to identify the role of managers, understand common issues in management, and cultivate and improve their management capabilities. During the innovation-training courses, the Innovator's Method was studied to help the management trainees understand the meaning of innovation and the key responsibilities of innovative leaders. In the practice of innovation project approval, the trainees' capabilities required for leading innovation projects were honed, including industry research capabilities, business insights, product awareness, and innovation leadership.

Manager training

To continuously sharpening the management's leadership, Baidu has developed a five-level leadership development framework covering programs such as Starting to Lead, Forging Ahead, and Navigating Through Management. A total of 2,400 managers attended the trainings in 2022. Baidu has also reserved and trained around 1,000 potential managers and close to 100 management trainees as a rich talent pool for Baidu's management team.

Encouraging further study and certification

Baidu encourages all employees to proactively continue to study at professional colleges and to attend various certification tests by providing them with financial supports to help them continue to learn and grow.

Performance on employee training

Baidu is committed to building a learning organization and creating an atmosphere where all employees continue to learn. Compared to 2021, the average training time for each employee increased by around 4 hours in 2022.

Indicator	Category	Unit	2021	2022
Number of employees trained by gender	Male	%	100	100
	Female	%	100	100
Number of employees trained by rank	Senior manager	%	100	100
	Middle manager	%	100	100
	General staff	%	100	100
Average number of training hours of employees by gender	Male	Hour	65.8	67.2
	Female	Hour	57.2	65.4
Average number of training hours of employees by rank	Senior manager	Hour	52.4	53.7
	Middle manager	Hour	67.5	68.4
	General staff	Hour	60.3	63.1

Employee training



How Does Baidu Work with the Industry to Cultivate AI Talent?

Baidu focuses on cultivating and absorbing elite AI talent and expand innovative talent pool. To this end, Baidu continually launches varied training programs to help cultivate industrial talent.

<div>Talent cultivating programs</div> <div><div>Baidu's strategic cooperation with universities:</div><ul style="list-style-type: none">Conducting in-depth industry-academia cooperation with universities by investing in AI teaching, training, computing power, engineers, and other resources to jointly cultivate innovative and practical AI talent.</div> <div><div>The Pine Cone talent training base :</div><ul style="list-style-type: none">Conducting talent cooperation with top universities in China by leveraging PaddlePaddle as a practice platform. The program is open to talents majoring in computer science and other related interdisciplinary fields.</div> <div><div>The Baidu Scholarship program :</div><ul style="list-style-type: none">The program is designed to identify, support, and encourage talents with the highest potential to become future technology leaders. By providing them with data, platforms, and expert guidance necessary for their research, the program delivers elite AI talent for Baidu.</div>			
<div>Highlights in 2022</div> <div><div>Signed agreements for in-depth cooperation with more than 100 universities.</div><div>Reached cooperation agreements with 123 top universities.</div><div>Enrolled over 12,000 trainees.</div></div> <div><div>Successfully held 10 sessions of the Baidu Scholarship program, and a total of 96 technical experts from top universities from around the world were trained.</div></div>			

Talent cultivating program highlights in 2022

What important awards did Baidu HRM win in 2022?

Name of award	Awarding body
China's Top 100 Best Employer of the Year 2022	Zhaopin
Most Popular Employer 2022	Shixiseng
Extraordinary Employer 2022	Liepin
Most Attractive Employer among College Graduates in China 2022	Universum

HR management awards in 2022

3.2 Talent Protection

How Does Baidu Protect the legitimate rights and interests of employees?

Upholding the principle of fair, just, and legal employment and considering the *Labor Law of the People's Republic of China*, the *Labor Contract Law of the People's Republic of China* as well as relevant laws and regulations in local jurisdictions where it operates, Baidu has developed the *Management Standard of Baidu Recruitment* to safeguard the legitimate rights and interests of employees. One of these safeguards is to eliminate forced and child labor as well as other illegal employment practices.

How Does Baidu Provide Employees with Competitive Salaries and Benefits?

Incentive plans


While continuously improving our salary competitiveness, Baidu has implemented an incentive model through which both short-term and long-term incentives are provided to employees.


<div>Salary competitiveness</div> <div></div> <div>Cooperating with third-party professional organizations to study outstanding salary incentive models in the market and providing employees externally competitive and internally fair remuneration after local economic development status and level of consumption are considered.</div>	<div>Short-term incentives</div> <div></div> <div>Offering year-end, monthly, quarterly, and semi-annual bonuses to employees with the amount of bonus and distribution frequency determined according to a position's business characteristics and job responsibilities.</div>
<div>Long-term incentives</div> <div></div> <div>The <i>2018 Equity Incentive Plan</i> covers nearly half of our employees, including some technical experts among general staff, middle-level managers, senior managers, and members of the board of directors.</div>	<div>The Baidu Top Award</div> <div></div> <div>The team that wins this award can receive a bonus of one million US dollars, which is by far the highest award given to ordinary employees by an Internet company in China. Three teams were awarded this in 2022.</div>


Incentive plans


Employee welfare and care


Baidu values the dedication of every employee and provides them (including full-time employees and part-time employees) with welfare and care in aspects such as living and health, with the aim of enhancing their senses of belonging, gain, and happiness.


**Work model:**
Flexible work schedule and working from home

**Induction care:**
Orientation

**Insurances :**
Medical insurance, supplementary commercial insurance (for example comprehensive medical insurance for regular employees, their parents, spouse, and children, critical illness insurance, term insurance, and accident insurance)

**Fertility support:**
Maternity leave, breastfeeding leave, childcare leave, mother-and-child room, priority seating

**Leisure activities:**
Club activities, Autumn Carnival activities

**Health care:**
Annual physical examinations, mental health services, fitness activities

Employee welfare and care



Case: The Green Pine Program

The Green Pine Program is designed to provide nationwide medical insurance for the parents of employees who have worked at Baidu for more than two years, regardless of their age, physical health, and social security status. This is the protection against unexpected risks we provide for our employees, aimed at helping them to overcome personal difficulties. Moving into our fifth year of the program, tens of thousands of employees have insured around 50,000 parents, covering 31 provinces across the country. A total of over 9,000 compensation cases have been accepted, with a maximum compensation amount of RMB300,000.



Case: Gift Boxes for Female Employees

On the eve of Women's Day in 2022, Baidu prepared specially customized gifts, including gym bags, Xiaodu smart scales, and customized bath towels for all female employees (both full-time and part-time) to reward their contributions and enhance their sense of happiness.



Case: Caring for Employees' Children

On Children's Day in 2022, Baidu prepared gift packages for those aged 0-14, including skipping ropes, mystery boxes of DIY sandbag materials, graffiti-patterned basketballs, and basketball bags to show our care for the healthy growth of the next generation.



Case: The Autumn Carnival Event

Baidu held an Autumn Carnival event in September 2022, when concerts in a forest, different games and awards conferring activities were held, enriching employees' spare time.

How Does Baidu Create a Healthy and Safe Workplace for Employees?

Safe workplace

Baidu is committed to providing our employees with a healthy and safe working environment and continues to improve our occupational health protection and safety management system.

- Completed the ISO 45001 occupational health and safety system certification in 2022.
- Routine emergency fire drills, fire safety inspections, first aid drills and trainings to enhance employees' safety awareness.
- Deploying first aid measures, including medical equipment, first aid medicines, doctors, and nurses. Baidu deployed a total of 54 AEDs covering all office areas in 2022.



Employees' physical health

Baidu has equipped itself with various health-related consultation and training activities to protect employees' health.

- Building stadiums, gyms, and other sports venues, and providing free fitness courses and competitions to encourage employees to exercise for better physical and mental health;
- Providing free physical examination and detailed report interpretation services for all employees on an annual basis and conducting various science popularization sessions on occupational disease prevention;
- Setting up a "Health Space" in the office area to provide employees with online / in-person medical consultations, medicine, medical kit for teaming-building activities as well as other free medical services and supports;
- Organizing the security to conduct first-aid drills on a regular basis together with the "Health Space" to ensure that professional medical consultation and treatment for employees who are not feeling well can be provided in a timely manner.

Case: AI-enabled Online Health Consultation Offering Medical Consultation Services for Employees

Baidu provides free professional medical consultation services to all employees through the AI-enabled Online Health Consultation feature on Baidu Health in 2022. The professional doctors are from public hospitals Grade II (or above) and 13 popular departments are set up to provide real-time online medical consultation services for employees in need from 8:00 a.m. to 10:00 p.m. to meet employees' needs for consultation and medical treatment.

Employees' mental health

In addition to physical health, Baidu values employees' mental health and provides lectures, psychological counseling as well as other forms of services to help employees enjoy their work and lead a happy life.

Case: Ledu EAP Provides Psychological Services for Employees

Baidu continued to leverage the Ledu EAP program to conduct psychological knowledge popularization and professional psychological tests for all employees to help them know more about their own mental health and improve their general mental health awareness. Baidu provides free psychological counseling services for employees, their parents, spouse, and children to untie their confusions, relieve their stress, regulate their anxiety, and improve their mental health. Ledu EAP provided a total of 1,249 person-times consultations in 2022.

Food safety

Baidu highly values food safety and has developed such catering management rules as the *Management Measures on Food Safety*. Regular inspections and assessments are conducted to monitor the entire process of warehousing, production and sales of food, and related ingredients, in employee canteens. Baidu has also commissioned third-party food safety monitoring agencies to conduct reviews on a regular basis to further guarantee food safety.

Sophisticated food safety report channels such as on-site monitoring personnel, one-click call function on dining tables, and QR code for satisfaction evaluation are provided for reports on food safety concerns. Baidu is committed to responding to employees' complaints as soon as possible, making necessary improvements based on employees' opinions, and providing feedback on the results in a timely manner.



Special care during COVID-19

Baidu strictly complied with the epidemic prevention measures and provided care for employees during COVID-19.

- Constantly updating the Employee Manual to enhance employees' awareness of epidemic prevention and to popularize information on COVID-19 control.
- The health report system provided for employees enabling Baidu to provide necessary help for COVID positive employees and the HR department, as well as other departments concerned, to take timely measures.
- The frequency of disinfection of high population density areas were increased, and protective equipment such as disinfectant alcohol, alcohol-based sanitizers, masks were offered to employees to protect their health.

Case: Providing Dedicated Medicine for Employees in the Fight against COVID-19

During the COVID-19 period, Baidu Health Mall set aside a special section for epidemic control, where exclusive benefits for purchasing medicines were provided for employees. Special offers such as coupons were also offered to employees to help them counter nationwide price increases and difficulties in purchasing medicines.

In earlier December 2022, when a COVID-19 outbreak struck Beijing and medicines were extremely difficult to buy, Baidu urgently purchased various kinds of scarce medicine boxes in the thousands and distributed them, in five batches, to over 2,000 employees. A total of over 10,000 doses were given out to employees.

In 2022, there were no casualties of employees, or contractors, or occupational diseases among employees at Baidu.



3.3 Workplace Diversity

How Does Baidu Understand Diversity, Equity and Inclusion?

- Baidu's core value – Simple and Reliable, fully demonstrates our understanding of diversity, equity, and inclusion.
- Breaking the traditional rank hierarchy by fostering corporate culture featuring "support for equity". Managers and employees maintain equality when interacting with each other to create a harmonious and equal workplace atmosphere;
 - Wariness of "small circles" and encouraging employees to participate in interest groups and preventing them from forming fellow-townsmen associations or alumni associations that are based on similar identities;
 - During their half-year job rotation, managers are not allowed to bring their original subordinates with them, which is to prevent unfair competition due to conflicts of interests.



How Does Baidu Perform on Talent Diversity?

Baidu values the protection of the rights and interests of female employees and cares about their career development. Baidu performed excellently in talent diversity in 2022, a manifestation of which is that female representation in the management increased to 43.9%, above industry average.

The proportion of female employees in management positions at Baidu grew to

43.9%

Indicator	Category	Unit	2021	2022
Female	Female representation in management	%	43.2	43.9
	Female representation in middle management	%	23.9	32.7
	Female representation in senior management	%	25.0	25.0
	Female representation in top management	%	22.2	20.0
	Female representation in revenue-generating management	%	53.0	56.9
Minority groups	Employees with disabilities	person	24	19
	Employees from Hongkong, Macao and Taiwan	person	39	35
	Employees from foreign countries	person	168	52
	Employees from ethnic minority groups	person	1,944	1,886
Hiring locally	South Korea	%	100.0	100.0
	The U.S.	%	10.2	16.2
	Japan	%	62.8	58.3
	Thailand	%	50.0	33.3

Employee Diversity

How Does Baidu Promote Talent Diversity?



Adhering to the concept of gender equality

Guided by the concept of gender equality, Baidu ensures equal opportunities for women in job applications and sticks to the principle of equal pay for equal work. It is committed to creating a fair, friendly and inclusive workplace environment for female employees, and continues to attract outstanding talent worldwide.

Case: Li Ying, Baidu's VP, Attends the APEC Women's Leadership Forum, a Demonstration of "HER" Power in the Field of AI

In 2022, Li Ying, Vice President of Baidu, delivered a keynote speech titled "Building an Innovation Pipeline in the AI Era" at the APEC Women's Leadership Forum. She proposed a leverage of AI and knowledge management as core foundations to efficiently create and accumulate knowledge through intelligent knowledge bases, boosting innovation across the board. We hope that outstanding female role models can inspire more "HER" to engage in the cause of science and technological innovation.

Case: Hosting the Female Leadership Roundtable

Baidu hosted the second Baidu Female Leadership Roundtable in 2022 and invited female executives to share their career experiences and success stories, including the topics of career development paths and how to quickly expand contacts at the workplace, so as to encourage female employees to keep learning at work and to proactively demonstrate their abilities and value in the workplace.

Promoting diversity in recruitment and promotion

Baidu encourages talent diversity and prevents any discrimination against employees based on factors such as gender, age, ethnicity, and region in policies and culture.

- Attracting talents with different backgrounds through diversified recruitment channels;
- Actively introducing professional talents with diverse backgrounds from outside to supplement multiple perspectives for business development;
- In talent' career development, focusing on their ability, experience, professional background, and suitability to positions.

Fostering a working environment where talents are respected

Committed to providing an equal working environment where everyone is respected, Baidu continually improves self-developed policies and regulations such as the *Baidu Human Rights Policy* and the *Baidu Employee Manual*. This aims to increase the respect of the human rights of employees including freedom of association and adopts zero-tolerance attitudes for any form of discrimination, harassment, or unfair competition.

Caring for minority employees

Baidu cares about minority employees, respects different cultural customs and living habits, and provides convenience for minority employees to integrate into the Baidu community.

- Setting up halal stalls or opening halal restaurants in the canteen of the office park to enrich employees' food choices.
- Deploying barrier-free facilities in the office building, including independent toilets, priority seats, ramps, elevators, and parking spaces to facilitate the work and life of employees with disabilities.

How Does Baidu Listen to Employees' Voices?

Communication mechanism

Baidu emphasizes communication with employees, advocating a culture of "straight to the point" and encourages employees to speak freely. We conduct various research activities to collect employees' complaints and expectations through an open employee complaint and feedback mechanism. In addition, employees can complain about disputes on aspects such as personal performance and cultural values, and the relevant person in charge will then promptly investigate, resolve and reply¹.

Communication activities



Director meeting

- Communicating meeting content to employees to help them understand the company's strategic direction.



Casual appointment

- Collecting employees' inquiries and feedback as well as conducting data analysis and summaries.
- Executives answering the questions for employees through live broadcast every quarter.



Simple survey

- Collecting employee opinions for two consecutive weeks on relevant topics.



Quarterly research

- Conducting a comprehensive evaluation of the atmosphere, morale, reputation, and mobility that employees feel at Baidu every quarter, and then assessing employees' engagement in the above four aspects.
- The recovery of the questionnaires in 2022 reached 97.5%, and the overall satisfaction and engagement performance of employees keeps increasing every year.



Fruit Tea Party for executives

- The Fruit Tea Party² was scaled up across the company as a tool for enhancing communication in 2022 for different departments to carry out communication activities.



Communication meetings

- Regularly holding communication meetings with contacts in various business lines to share work experience and discuss actual problems.
- Conveying the communication results to employees to deepen their understanding of company strategy and culture as well as improve their morale.

Communication activities

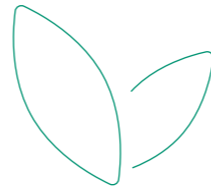


¹ For more details, see page 27, Baidu Special Report on Human Capital 2020.

² Fruit Tea Party for executives provides opportunities for the management to talk face to face with frontline employees. For more details, see page 8, Talent Development, Baidu 2021 Environmental, Social and Governance Report

04

Promoting Green Ideas



With a focus on sustainability, Baidu implements green development ideas. In 2022, we utilized energy-saving technologies, optimized energy use structure, and implemented our own green operations. These efforts have provided green and smart solutions for multiple industries and scenarios, promoting a low-carbon lifestyle, addressing climate change, and working together for a green planet.

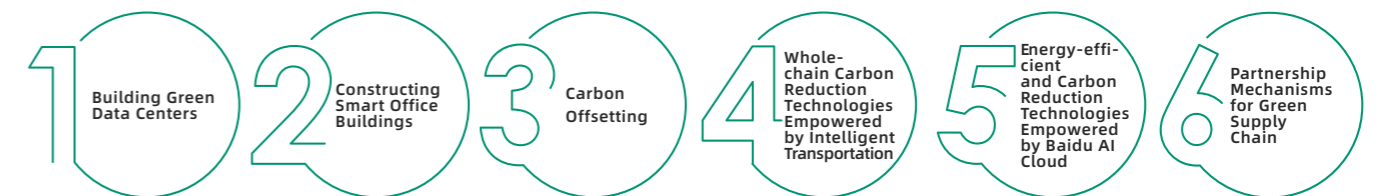
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Addressing Climate Change

What Are Baidu's Strategies and Objectives for Addressing Climate Change Risks?

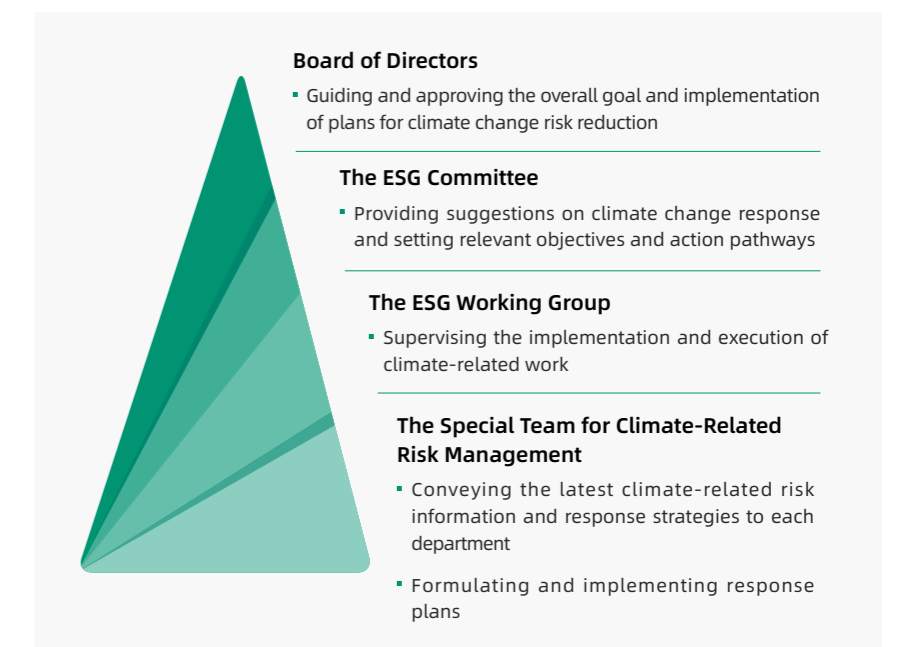
With the released the carbon-neutral climate goal in 2021, Baidu has deployed six strategic pathways¹ and continually adopts green practices.

Internally, Baidu has improved the energy efficiency, increased the proportion of renewable energy consumption, and continuously optimized the energy structure. Externally, Baidu has deployed green technologies, empowered sustainable development of all walks of life with green technologies, and practiced green ideas² together with ecological partners.



What Is Baidu's Management System in Addressing Climate Change?

Based on the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) working group, we further improved the climate-related risk management through the establishment of a climate change management system with the Board of Directors as the highest leadership body as well as the assignment of a special team for climate-related risk management to implement the system.



¹ For details, please refer to "Promoting Green Ideas - 03" under Baidu 2021 Environmental, Social and Governance Report



² For details, please refer to Baidu Carbon Neutrality Panorama

How Does Baidu
Respond to Climate
Change Risks?

In 2022, based on climate-related risks identified, Baidu has formulated specific countermeasures:

Risk category	Risk description	Risk response
Policy and legal risk	Regulatory agencies and capital market rating indexes increasingly raised the disclosure requirements for environmental information of enterprises.	Strengthening environmental information disclosure <ul style="list-style-type: none">Studying policy control risks, strengthening communication with stakeholders and responding to their requirements;Promoting the refinement of energy management;Disclosing the proportion of green technologies and clean energy used to achieve energy conservation and efficiency.
Technical risk	Under the background of the national carbon peaking and carbon neutrality goals, low-carbon technology is booming, putting forward higher requirements for Baidu's energy conservation and environmental protection technology R&D, facility application and special investment in energy conservation and emission reduction.	Accelerating low-carbon technology transition <ul style="list-style-type: none">Exploring green and low-carbon technologies in fields such as lithium batteries, cooling systems and computing power as well as considering the suitability of technical solutions;Maximizing the consumption of renewable energy such as wind energy and solar energy in data centers, and adopting low-energy equipment;In 2022, Baidu generated 6,074,031 kWh of electricity from renewable energy sources;In 2022, Baidu data centers signed a contract to introduce 1 billion kWh of green power, and the Yizhuang Data Center participated in green power trading in Beijing, with a transaction volume of 5,080 MWh.
Market risk	As the public's demand for low-carbon consumption increases, if Baidu's existing data centers and products such as Xiao Du smart homes fail to effectively reduce carbon emissions in the production and operation process, it will directly lead to a lower demand for related products and services from downstream customers due to a low-carbon consumption preference, resulting in a decline in business revenue.	Responding to market demand for low-carbon consumption <ul style="list-style-type: none">Continuously introducing intelligent heating, water, transportation services and other green solutions for the transportation sector and high-emission enterprises to help customers achieve green and low-carbon transition;Building green data centers, and committing to providing customers with 100% renewable energy AI cloud services;Optimizing the packaging materials of Xiao Du smart homes and adopting renewable and recyclable materials.
Reputational risk	Potential concerns will be raised by customers, investors, and the public of "greenwashing behavior" if Baidu only releases the climate strategy or relevant statement without concrete actions, thus undermining the corporate image.	Managing reputational risk <ul style="list-style-type: none">Regularly disclosing emission reduction measures and results according to the six emission reduction pathways, and further formulating emission reduction targets and corresponding target attainment approaches.
Acute risk	Extreme weather events such as typhoons and extreme precipitation may disrupt the daily operations of the data centers and the Company, thus negatively affecting the business operation and corporate image.	Reducing the impact of extreme weather <ul style="list-style-type: none">Completing the pre-analysis of local natural disasters according to the location of the data centers, so as to avoid the areas being affected by extreme weather in advance and protecting the safety of the data centers;Formulating emergency management plans for extreme natural disasters, contingency plans for natural disaster prevention and control, and emergency measures for unexpected incidents.
Chronic risk	Changes in climate and precipitation patterns may lead to risks such as continuous high temperatures and water scarcity, which may increase the water use cost for data centers' operations and pose greater challenges to the cooling and water saving technologies.	Addressing changes in climate and precipitation patterns <ul style="list-style-type: none">The self-built data centers are preferentially built in the area where natural cold source technology can be efficiently utilized with abundant green energy (such as wind energy);Continuously developing liquid cooling technology to reduce energy consumption of mechanical refrigeration.

How Does Baidu Help
Address Climate Change
Risks with Green Financial
Products?

Baidu actively explores the use of green financial products to ensure the stable supply and delivery of green technology R&D funding during the period of achieving carbon neutrality. Since the successful pricing and issue of a US\$1 billion sustainable development bond, Baidu has allocated the total net proceeds from the first sustainable development bond issued to the financing and refinancing of sustainable development projects in accordance with the sustainable financing framework, and has made progress in green buildings, green transportation, and clean energy consumption¹.



4.2Green Operations

How Is Baidu's Environmental Performance¹?

In 2022, Baidu started carbon checks for 33 operating sites, including the office buildings and data centers. For details of the carbon checks, please refer to "Appendix - Carbon Emission Accounting Methods".

Indicator	Unit	2020	2021	2022
Diesel	t	617.5	184.0	118.5
Gasoline	kg	7,911.9	8,712.7	377,725.3
Natural gas	10,000 m ³	256.5	260.0	267.2
Electricity	MWh	529,137.4	673,829.3	902,076.0
Purchased heat	GJ	75,063.7	110,680.7	447,437.2
Renewable energy	kWh	/	3,049,469.3	6,074,031.0

Baidu's Energy Consumption

Scope	Unit	2020	2021	2022
Scope 1 GHG emissions ³	tCO ₂ e	5,974.1	16,407.0	20,320.9
Scope 2 GHG emissions ⁴	tCO ₂ e	468,245.5	601,740.2	801,942.2
Scope 3 GHG emissions ⁵	tCO ₂ e	16,621.8	1,173,460.6	1,299,528.5
Total GHG emissions	tCO ₂ e	490,841.4	1,791,607.8	2,121,791.6
GHG emissions intensity	tCO ₂ e/RMB 1 million	4.6	14.4	17.2

Baidu's GHG Emissions ²

¹ In 2022, Baidu's environmental performance indicators covered all Headquarter office buildings in Beijing, Beijing Yonyou, Chengdu, Tianjin, Shanghai Jiading, Shanghai Caohejing, Suzhou, Hainan, Guangzhou Helenbergh, Guangzhou Intelligent Cloud, Guangzhou Xiaodu, YY, Shenzhen Sita, Foshan, Zhitu Shunde, Zhitu Jinan Branch; R & D centers in Shanghai and Shenzhen, and all data centers, which was larger than the coverage in 2021.

² Baidu's GHG emissions (Scope 1, 2 and 3) in 2022 were verified and certified by third-party professional institutions.

³ Direct emissions, including lost and fugitive emissions from stationary combustion sources, boilers, kitchen equipment, refrigerators, etc.

⁴ Indirect emissions, involving emissions from purchased electricity, steam, and heating.

⁵ Other indirect emissions, involving employee commuting and power consumption of rented data centers.

Indicator	Unit	2020	2021	2022
Total non-hazardous waste ¹	t	3,907.6	6,939.0	5,273.8
Non-hazardous waste intensity	t / person	0.1	0.2	0.2
Total hazardous waste ²	t	27.2	27.5	6.9
Hazardous waste intensity	t / person	0.0009	0.0008	0.0002

Waste Produced by Baidu

Indicator	Unit	2020	2021	2022
Total water consumption	t	1,279,940.6	1,576,309.8	1,997,531.4
Water consumption intensity	t / person	40.8	43.3	57.4
Wastewater discharged	t	591,523.5	584,399.9	1,301,265.5
Rainwater collected	t	4,900.0	6,640.0	5,210.0

Baidu's Water Consumption



¹ Non-hazardous waste including office paper, waste cartons, books and newspapers, scrap metal, waste plastic, kitchen waste, and other non-hazardous wastes.

² Including used; lamps, electronic equipment, toner cartridges, and batteries. In 2022, Baidu sold obsolete electronic equipment to the second-hand market, greatly reducing emissions from hazardous waste.

How Does Baidu Build Green Data Centers?

Building green data centers with high efficiency and low energy consumption is an inherent requirement for Baidu to pursue sustainability. This can provide clean and low-carbon cloud services for the society and inject green kinetic energy into the intelligent economy era. Therefore, Baidu set up a low-carbon energy-conservation management team to formulate annual Carbon Usage Effectiveness (CUE), Power Usage Effectiveness (PUE) and Water Usage Effectiveness (WUE) assessment indicators and break down such indicators into monthly and quarterly assessments.

PUE Management

At Baidu, we continually innovate green technology in our own data centers, and have reduced carbon emissions from lithium batteries, refrigerating system and computing power usage. Baidu has realized energy conservation and emission reduction through technology output and computing power migration in the leased data centers.



Battery Backup Units (BBU) technology

Baidu data centers use built-in lithium battery cabinets, completely eliminating UPS and lead-acid battery configuration, saving space by more than 25%, with the power supply efficiency up to 99.5%.



"Baidu Pinghu" DC lithium battery system

"Baidu Pinghu" DC lithium battery system integrates high-voltage DC technology with small sized, non-polluting, long-life and low-maintenance lithium battery technology. In 2022, the system enabled peak load shifting for energy storage on the user's end. Baidu has deployed over 80 sets of the system in Yangquan Data Center, resulting in a 60% reduction in the space occupied by primary batteries.



Liquid cooling system

Baidu's liquid cooling system was designed in modular mode, improving space utilization by 15%. The system also incorporates an AI intelligent cooling control algorithm, resulting in a 50% increase in energy efficiency. In 2022, Baidu installed over 100 cold-plate liquid cooling cabinets at the Yangquan Data Center and experimented with an immersion liquid cooling system.



"Iceberg" transformer cooling system

Baidu data centers deploy an "Iceberg" transformer cooling system that uses a refrigeration cycle. When launched at the Yangquan Data Center in 2022, the system increased computing power by 20% and reduced carbon emissions by 60%.



Overhead Cooling Unit (OCU)

Baidu uses a self-developed air-conditioning terminal that relies on air convection to circulate cold and hot air, reducing energy consumption. At the Yangquan Data Center, Baidu's single-module air conditioning system using this technology saves over 2 million kWh of electricity annually.



Tidal computing technology

Baidu uses tidal computing technology to release memory resources at night, thus effectively utilizing idle computing power. In 2022, this technology helped Baidu data centers save 102,017,843.05 kWh and reduced carbon emissions by 71,919 tons.

Energy Conservation Technology and Equipment of Data Centers

The transaction volume of green power

5,080 MWh

The average annual PUE of 1# module of Baidu Yangquan Data Center

1.08

The average annual WUE of a single module in Baidu Dingxing Data center

0.92

How Does Baidu Green Offices?



While achieving technological innovation, Baidu continues to optimize the energy structure and increases the consumption of clean energy.

Site selection and planning stage

Giving priority to areas rich in renewable energy such as light and wind energy.

Construction stage

Making full use of roof space to build photovoltaic power stations and increase the proportion of solar energy consumed.

Operation stage

Actively participating in green power trading. In 2022, Baidu data centers signed a contract to introduce 1 billion kWh of green power and participated in green power trading in Beijing with a transaction volume of 5,080 MWh.

According to our plan to realize carbon neutrality by 2030, Baidu data centers will gradually change the energy consumption structure over time to finally achieve the goal of 100% renewable energy use and provide customers with 100% clean cloud computing services.

In 2022, the average PUE of Baidu data centers was 1.16¹, and the average annual PUE of 1# module of Baidu Cloud Computing (Yangquan) Center was 1.08.

WUE Management

While reducing energy consumption in our data centers, we actively explore water-saving technologies such as wastewater recovery and reuse technologies as well as electromagnetic wave water treatment technologies. We have taken multiple measures to reduce water consumption. In 2022, the average annual WUE of a single module in Baidu Dingxing Data center was as low as 0.92.

Office paper	14,257.4kg
Waste cartons, books, and newspapers	16,365.0kg
Scrap metal	712.0kg
Waste plastics	1,936.0kg
Light tube	7,946.0 items
Electronic equipment	693.0 items
Toner and ink cartridge	1,870.0 items
Battery	20,976.0 items
Kitchen waste	1,948.4t
Others	3,292.1t

Baidu's Office Waste in 2022

Energy Conservation Management

Energy conservation	Operation and maintenance transformation	Baidu upgraded the lighting systems of Baidu Campus and Baidu Technology Park. It is estimated that 4.8 million kWh of electricity can be saved annually.
		Baidu completed the energy-conservation automatic control transformation of boilers in Baidu Technology Park, and added measures including climate compensation control, frequency conversion control of circulating pumps and upper computer group control. It is estimated that it can reduce the use of natural gas by around 90,000 m³ annually.
		Baidu reinstalled energy-conservation devices for the 33 elevators in Baidu Campus, Baidu Technology Park and Penghuan Building. It is estimated that it can save 250,000 kWh of electricity annually.
New energy consumption	Photovoltaic	Baidu repaired three refrigerating units in Baidu Campus to improve the operation efficiency of the equipment. As a result, the ice storage time in the ice pond decreased by around 13% compared to the same period in 2021.
		Baidu applied distributed photovoltaic power generation systems on the roofs of both Baidu Campus and Penghuan Building. These systems had a combined installed capacity of 964.44kw and a total power generation of 602,900 kWh.
		New photovoltaic power generation systems were installed in Baidu Technology Park, with a designed total capacity of around 1,265 kWp and an estimated annual power generation of around 1.67 million kWh.

After the solar photovoltaic power generation systems were installed in Baidu Campus, Penghuan Building and Baidu Technology Park, it is estimated that they can provide around 2.6 million kWh of clean electricity for administrative operations annually.

The solar water heating system in Baidu Technology Park has the potential to reduce boiler gas consumption by around 34,000 m³ throughout the year.

Water Conservation Management

- By improving employees' awareness of water conservation, upgrading equipment, and optimizing wastewater treatment and water resource recycling, Baidu has effectively increased the utilization rate of water resources.
- Overflow pipes were added to the cooling tower of Baidu Technology Park to introduce water into a tank for reuse, saving approximately 2,200 tons of water throughout the year.
 - The rainwater collection pool was upgraded for greening irrigation, allowing an estimated 500 tons of rainwater to be recycled annually.
 - Baidu Campus's wastewater treatment system reused 3,643 tons of wastewater in 2022, realizing the recycling of water resources.

Around

8,000

pieces of equipment disposed of annually

Intelligent conference hardware could save electricity up to

151

million kWh per year

Recycling Management of Wastes and Office Assets and Equipment

To promote refined refuse management, Baidu focused on cultivating employees' habits of refuse classification and engaged specialized companies to clear and transport the categorized refuse. To monitor waste production, Baidu recorded and monitored each type of waste on a daily basis. Baidu also commissioned qualified enterprises to collect and sell discarded computers and other office equipment, with around 8,000 pieces of equipment disposed of annually in an environmentally friendly manner.

Awareness Advocacy

It is the duty of every Baidu employee to practice the ideology of greening our offices. In order to enhance employee awareness of environmental protection, Baidu launched the "520, Low Carbon Action" campaign, calling on all employees to reduce the use of disposable tableware, develop a green lifestyle and reduce the unnecessary waste of resources.

Innovation Driving Green Development

Based on leading AI technology and long-term knowledge application practice, Baidu created an "Innovation Assembly Line", drove large-scale innovation with "Innovation Assembly Line = AI x Knowledge Management", developed intelligent office products, and created an intelligent work platform. As one of the representative products of the "Innovation Assembly Line" concept, Baidu Infocloud has realized paperless and low-energy offices by optimizing the flow and application of data in scenarios such as financial, personnel, conference and park management. It was estimated that in 2022, 1.06 million pieces of paper were saved with the application of the "Innovation Assembly Line", equivalent to 353 20-year-old trees. In terms of electricity consumption, a single intelligent conference hardware could save up to 1.51 million kWh of electricity over the course of a year.



4.3

Green Products and Services

How Does Baidu Contribute to the Construction of Low-Carbon Cities?

Baidu has leveraged accumulated AI technology over many years to empower the construction of low-carbon cities with science and technology. Using the 'smart+' model, Baidu has connected and analyzed urban operation, promoting the efficient allocation of public resources, and enabling cities to become smart and "green".

Case: Baidu AI Cloud Facilitates Beijing Haidian to Build a "City Brain"

Baidu facilitated the construction of a "City Brain" in Haidian District, Beijing. Using AI as the core, the "City Brain" gathered data resources from each area of the city to regulate carbon emissions and achieve low-carbon operations. This enabled the provision of support for optimizing low-carbon policies and achieving global coordination of urban green governance.

Supervision of Urban Carbon Emissions

- By monitoring and analyzing the air pollution, river pollution, and bare land using remote sensing data in conjunction with the point data from air and water quality monitoring stations to trace the source of environmental pollution;
- By using AI technology to automatically identify pain points in urban environmental management such as littering, out-of-store operations, and garbage exposure, we are able to supervise, report, distribute, and dispose of such violations, thus reducing the carbon emissions generated from these activities;
- By using algorithm identification, we are able to accurately capture illegal and high-pollution vehicles, as well as muck vehicles involved in illegal dumping, in order to eliminate illegal emissions from key vehicles;
- Monitoring dust in real time with AI technology to prevent environmental pollution.

Urban Low-Carbon Management

- Constructing urban operation monitoring system through sensors, roadside intelligent devices, and Internet technologies to collect data of each urban application scene, with the urban perceptual neural network supporting the analysis and decision-making of carbon emission data by the "City Brain";
- Building AI computing centers with Baidu's deep learning platform, PaddlePaddle, to provide basic computing algorithm support in a unified and centralized way, decrease repeated investment and construction, and indirectly reduce carbon emission intensity.

Facilitating Carbon Emission-Reduction Policy Optimization

- Based on our extensive data and algorithm accumulation, Baidu has analyzed factors such as passenger flow, motor vehicles and non-motor vehicles to improve transport efficiency and reduce carbon emissions generated by traffic congestion. We continuously learn and optimize our analysis to aid in the design, implementation and iteration of application policies.

How Does Baidu Facilitate Low-carbon Development of Industries?

As an "AI platform company focused on empowering others", Baidu is committed to the full-stack layout AI technology, facilitating each industry to achieve low-carbon intelligent transformation and benefit from cost reduction and efficiency increase.

Advancing the Green Transformation of Energy Industries

Baidu has built a clean, low-carbon, safe and efficient smart energy system by virtue of "Integrating Cloud and AI" to assist high-carbon-emission enterprises in saving energy and reducing carbon emissions.

Greening Logistic

Relying on AI algorithms, Baidu Maps builds intelligent scheduling solutions that comprehensively consider multiple factors such as vehicle types, restrictions, and costs to generate a better transportation scheduling solution, improve logistics efficiency and accelerate industries to develop in a low-carbon manner.

Case: Baidu Cooperates with Zhonghuan Huanhui to Create a New Intelligent Heating Mode

In 2022, Baidu AI Cloud cooperated with Zhonghuan Huanhui, a heating enterprise, to create an innovative intelligent heating mode of "Integrating Cloud and AI", Using advanced technologies such as AI, big data, Internet of Things and edge computing, Baidu's AI algorithm, mechanism model and multiple models of artificial experience were optimized in a mixed mode to provide a "dynamic heating control strategy" and enabled intelligent fine management of heating operation control. This resulted in the reducing the energy consumption of heating enterprises by 10-20% and estimated carbon dioxide emissions by 19 kg/m².

Case: Baidu Works with YTO Express to Create "Intelligent Logistics Engine 2.0"

To address the challenges posed by the fragmented resources and inadequate digitalization in the logistics industry, Baidu partnered with YTO Express to develop the "Intelligent Logistics Engine 2.0"¹. By integrating essential geographical and logistics data, Baidu Maps offers location-based services, maps, navigation, and route planning to the logistics sector. Through intelligent means, it addresses YTO Express's pain points of poor service accuracy and delivery efficiency, thereby reducing carbon emissions resulting from incorrect order information and route planning.



¹ Baidu AI Cloud -Exploring New Intelligent Ways Across Industries

How Does Baidu Help Green Mobility?

According to a report by the World Resources Institute¹, carbon dioxide emissions from transport sector accounted for 9% of the total emissions in China, making it the second largest source of emissions. Specifically, road transport accounted for approximately 84.1% of the total emissions from the transport sector in China. In order to realize the intelligent and low-carbon development in the transport sector, Baidu continuously explores innovation in intelligent transportation and autonomous driving, for instance we have built an Intelligent and Connected Vehicle (ICV) ecology with "Single-Agent Intelligent" and "vehicle-road cooperation" in parallel, and comprehensively laid out an intelligent driving solution with intelligent vehicle, road, and mobility.

Intelligent Transportation

- By providing multi-scene solutions for the transport sector, including intelligent traffic signal control, intelligent traffic management, intelligent parking, intelligent expressway, we reduce unnecessary carbon emissions by improving the overall transportation efficiency. By 2030, Baidu will promote the urban transport reduction of 70 million tons of carbon emissions, which is about 8% of the national carbon emissions in 2020.

Autonomous Driving

- By applying autonomous driving technology in new energy vehicles (NEVs), we improve the mobility experience and promote the replacement of traditional fuel vehicles by intelligent new energy vehicles;
- The large-scale application of autonomous driving will also improve driving efficiency and mobility safety, shorten mobility congestion duration, and reduce carbon emissions.

Green Mobility

- By exploring innovative transportation modes such as MaaS² and autonomous ride-hailing services, we can advance the development of shared mobility, promote the idea of "Share! Don't buy!", decrease the use of private cars as well as reducing the amount of carbon emissions.

Green Intelligent Network Connection

Baidu accelerates the layout of intelligent transportation ecology, and is committed to laying smarter and greener roads. Through intelligent network connection solutions, based on the ACE intelligent transportation engine, Baidu continuously improves traffic efficiency and reduces carbon emissions caused by both traffic lights and traffic accidents.

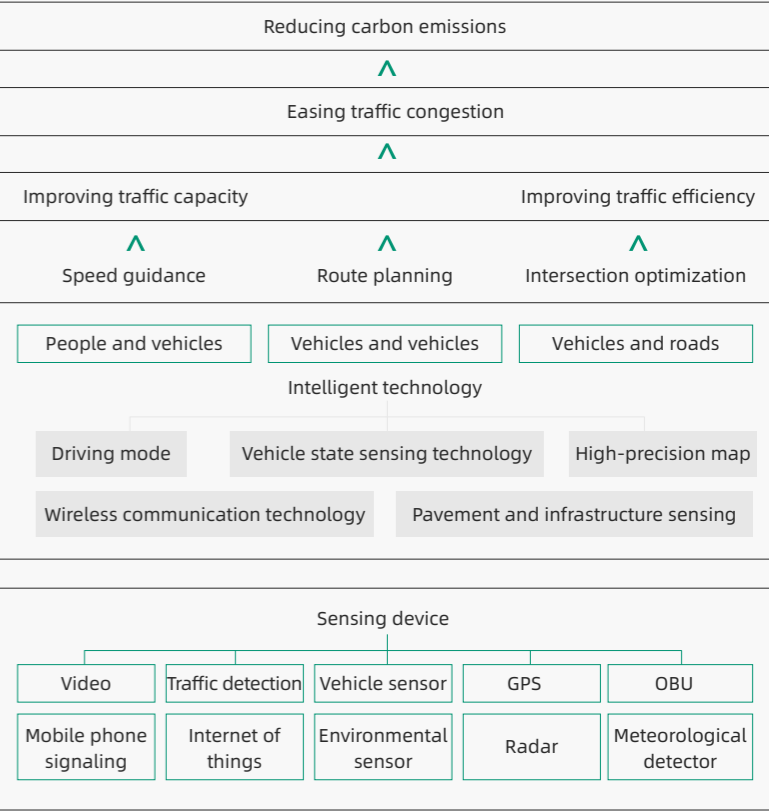
The annual carbon reduction of Beijing Yizhuang High-level Automated Driving Demonstration Area can reach

17,000 tons

Case: Baidu's Intelligent and Connected Vehicle Technology Brings Smooth Traffic in Yizhuang

Baidu cooperated with Beijing Yizhuang High-level Automated Driving Demonstration Area to build an intelligent transportation demonstration zone. By 2022, Baidu's intelligent transportation system had covered 329 intersections in the demonstration zone. By sensing information such as traffic flow and vehicle queuing, the system can automatically adjust the flashing duration of traffic lights at intersections in real time to help vehicles move more smoothly. At the same time, Baidu Maps can suggest the best driving speed and lane for car owners to ensure that they have a green light run on arrival at intersections, effectively reducing the waiting time, and avoiding unnecessary energy consumption caused by traffic lights.

According to statistics, the Yizhuang Demonstration Area has achieved an average delay reduction of 28.48% in single-point self-adaptive intersections, 30.30% in vehicle queue length and 18.33% in waiting for green lights. The average annual reduction of carbon emission at each intersection has reached 51.71 tons. If we calculate that into 329 intersections, the annual carbon emissions can be reduced by 17,000 tons.



Basic Principles of Carbon Emission Reduction with Intelligent and Connected Vehicle Technology



¹ World Resources Institute: Toward Net Zero Emissions in the Road Transport Sector in China

² Mobility as a service refers to acquiring and managing transport-related services through electronic interactive interfaces to meet consumers' mobility requirements.



The average daily utilization rate of parking spaces may be increased to

62%

The average annual carbon emission reduction per parking space reaches

204.31 kg

The total carbon emission reduction is

688.12 t/year

Green Intelligent Parking

Baidu's Intelligent Parking Scheme, has alleviated urban parking difficulties and reduced carbon emissions generated by vehicles due to seeking parking spaces and waiting for parking. This has been realized by utilizing the advantages of high-level video technology, autonomous parking capability, urban parking operation and management capability and the hundreds of millions of users of Baidu Maps. Parking-level navigation of Baidu Intelligent Parking shortened the time for car owners to find parking spaces by 60%, effectively alleviating traffic congestion and energy consumption caused by cruising for parking spaces.

Case: Baidu Assists Hunan Zhuzhou in Establishing a Green Intelligent Parking Transformation Scheme

Baidu created an integrated intelligent parking management platform with high-level video, PDA inspection, Parking Guidance Information System (PGIS), closed parking payment system technologies in Zhuzhou, Hunan Province. This met the needs of users to quickly find parking spaces and pay parking fees.

The "Zhuzhou Intelligent Parking System" has effectively improved overall parking efficiency and reduced traffic congestion by shortening parking duration and driving distance. As a result, the system has produced significant benefits in terms of carbon reduction. Upon calculation, the average daily turnover rate of the parking lot may be increased from 1.3 to 6 sets/day, the average daily utilization rate of parking spaces may be increased to 62%, and the average daily carbon emissions in each parking space reach 119.14g. The Phase I and Phase II of Hunan Zhuzhou Intelligent Parking Project have been completed and put into use, the average annual carbon emission reduction per parking space reaches 204.31 kg. Calculated based on 3,368 parking spaces in 46 parking lots, the total carbon emission reduction is 688.12 t/year, which is equivalent to the carbon dioxide absorbed by 37,600 trees.

Green Intelligent Expressway

As a new digital infrastructure in intelligent transportation, Intelligent Expressway has become a hot topic for transportation experts around the world. Many countries are accelerating their deployment of this technology. In order to alleviate expressway congestion and address the impact of extreme weather such as fog, Baidu has continuously developed core technologies to improve road sensing and monitoring capabilities and has made it possible to achieve all-weather access.

The average traffic efficiency can be increased by over

10%

The project involves constructing a "quasi-all-weather access" demonstration road over

200 km

Case: Baidu Works with Hebei Expressway Group for Joint Construction of an Intelligent Beijing-Harbin Expressway

Baoshan section and Langfang section of Beijing-Harbin Expressway are important transportation channels connecting North and Northeast China. In 2022, Baidu and Hebei Expressway Group jointly launched the Beijing-Harbin Expressway Intelligent Construction Project to improve both the intelligent and informatization management level of expressways.

Traffic Efficiency Improvement

Baidu has implemented intelligent sensing equipment along the Beijing-Harbin Expressway. This involves utilizing radar video and integrating core technology breakthroughs of the sensing system to achieve road condition monitoring, real-time vehicle tracking, abnormal event alarming, and surveillance video linkage. The integration of these functions is expected to improve the average traffic efficiency by over 10%, reducing congestion and minimizing the associated carbon emissions.

"Quasi-All-Weather" Access¹

In order to address climate change and minimize the restrictions of extreme weather on the traffic of vehicles on the expressway, an environmental condition sensing system will be built in Baidu's Beijing-Harbin Expressway Intelligent Construction Project by virtue of the radar video fusion sensing system to provide information warning and guidance services for vehicles on the expressway. This will ensure the traffic of vehicles are safe under certain bad weather conditions. The project will involve constructing a "quasi-all-weather access" demonstration road over 200 kilometers.

Green Shared Mobility

In order to achieve green mobility, Baidu has applied autonomous driving technology in NEVs, continuously optimized private mobility modes, and made contributions to social energy conservation and emission reduction.

Baidu launched Robotaxi, a new autonomous ride-hailing platform, providing commercial autonomous ride-hailing services in cities including Beijing, Chongqing, Wuhan, Changsha, Hefei and Yangquan. Of these cities, Wuhan and Chongqing made fully driverless commercial ride-hailing services available. As of the of January 2023, Robotaxi had received over 2 million orders, making Baidu the world's largest autonomous ride-hailing service provider.

In 2023, Luobokuaipao aims to continue business expansions by adding 200 fully driverless vehicles across the country, with the goal of creating the world's largest driverless operation service area.

Robotaxi received over

2 million

orders

¹ "Quasi-all-weather" access: in case of bad weather, the traffic may be restricted. For example, vehicles are not allowed to traffic on expressways for fog restricted visibility. However, safe traffic rule can be obtained through meteorological data analysis, radar tracking and monitoring, warning, and reminder of supporting App, as well as data simulation to simulate traffic conditions in bad weather. Vehicles can be tracked and monitored, traffic on the road upon appointment on App according to the safety rules suggested by App.



The low-carbon route planning of Baidu Maps can reduce carbon emissions by

40%

Green Navigation

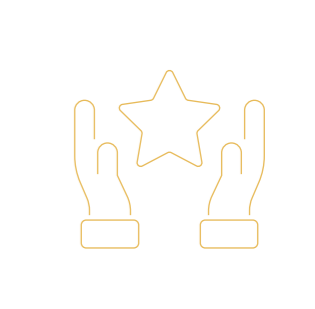
While continuously upgrading urban road traffic construction, Baidu Maps is committed to providing users with green and low-carbon navigation services. Baidu launched "Low-Carbon Plan" Program, which collects and calculates the carbon emission reduction of users participating in the Program and puts it into the carbon trading market to encourage the public to travel in a green manner. At the same time, Baidu continuously optimizes the navigation function for NEVs, captures the information of surrounding new energy charging piles in real time, solves the difficulty of car owners in seeking charging piles, and promotes the popularity of New Energy Vehicles (NEVs).

Case: The Low-Carbon Route Planning of Baidu Maps

According to statistics, when the average speed of vehicles increases from 20 to 30-40km/h, fuel consumption can be reduced by 20-40% and carbon emissions can be reduced by 40%. Baidu Maps continuously optimized functions such as route guidance and planning to decrease traffic jams. Thanks to BeiDou Navigation Satellite System (BDS) technology, Baidu Maps has launched "Real" lane-level navigation, parking-level navigation, and intelligent intersection navigation services to improve mobility efficiency, protect mobility safety and reduce carbon emissions caused by traffic jams and accidents:

- "Real" lane-level navigation: covers national expressways and highways, as well as city-level roads in 13 cities including Guangzhou and Wuxi. This feature offers users more precise information about their route, allowing them to enter the optimal lane ahead of time to avoid potential traffic incidents in areas where Bus Only lanes and emergency lanes are prone to being violated. By promoting safe driving, this navigation system reduces the carbon emissions that result from accidents and low transportation rates.
- Parking-level navigation: users can locate the nearest available parking space with just one click, and the system also provides a reverse car-seeking navigation function through intelligent parking services. This feature helps efficiently guides drivers to their parking spot. The service has already been implemented in various large-scale parking lots, including those at Beijing Fengtai Station and Beijing Livat Mall.
- Intelligent intersection navigation: offers an intelligent countdown service for more than 1 million traffic lights in nearly 3,000 cities, districts and counties throughout China. This service displays the remaining seconds until the traffic lights change, provides light change tips, and predicts traffic light behavior, enabling users to adjust their speed and avoid sudden braking, which in turn reduces carbon emissions.

05
Improving Services



At Baidu, we value content governance and user experience improvement, and continue to provide users with high-quality, safe, and reliable products and services. While building a healthy online environment, we continue to promote innovation within both the company and the industry, and to empower different industries with our leading AI technology.



5.1 Content Governance

The Human Rights Impact Assessment and Management of Content Governance

As the largest search service provider in China, we stand by our original mission of "make the complicated world simpler through technology". We do this by consistently improving the search experience and the quality of information recommendations, as well as providing users with high-quality and reliable search services. At Baidu, we keep in mind our social responsibility as a platform. To achieve this, we follow the "Ten Principles" of the UN Global Compact, establish a comprehensive content governance management system, employ cutting-edge AI technology, and endeavor to safeguard the rights and interests of each user. All of these efforts combine to create a clean and healthy Internet content ecosystem.

Our Commitments

As a signatory to the UN Global Compact, Baidu is committed to following the "Ten Principles" and has formulated the *Baidu Human Rights Policy*. We encourage our partners and suppliers to follow this policy. Baidu actively takes various measures to protect the rights of users. In terms of the governance of content ecosystem, we have built a balanced mechanism where the individual authorizes, the platform shoulders responsibility and the state supervise. Through the mechanism, Baidu has proactively and effectively implemented human rights protection in content governance, so as to create a healthy and sound online environment.

The ways in which Baidu fulfills the commitments include, but are not limited to:

- The right to equality, non-discrimination, and access to information: Baidu's products empower all social groups, including minorities, to have equal access to information at lower cost, and to achieve "data equality".
- The right to freedom of opinion and expression: Baidu respects and protects users' freedom of speech on all of products and platforms provided that such freedom is in compliant with national laws, regulations, and management norms.
- The right to benefit from scientific progress: Baidu continues to optimize product design and services, and strives to provide equal opportunities for disadvantaged groups to enjoy digital dividends.
- Freedom from slavery¹ and right of personality: Baidu keeps cracking down on harmful information such as data on human trafficking and cyber violence.
- Life, body, and health rights: Baidu has stepped up efforts to identify and remove illegal and harmful information on the Internet to maintain a healthy and orderly content ecosystem. We have intensified efforts to govern business promotion content related to healthcare and remove information on violence to protect the right of life and health of users.
- Protection of the rights of minors: Baidu strictly prohibits contents from violating the legitimate rights and interests of minors or harming their physical or mental health. In addition, minors and their guardians are entitled to the right of access, correction and supplement, withdrawal of consent, deletion, cancellation, reproduction, portability, and interpretation, to ensure the safety of minors' personal information and privacy.

The international conventions that Baidu follows include but are not limited to:

- *The Universal Declaration of Human Rights*
- *The International Covenant on Economic, Social and Cultural Rights (ICESCR)*
- *The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)*
- *The Convention on the Rights of Persons with Disabilities (CRPD)*
- *The Convention on the Rights of the Child (CRC)*
- *The Declaration on Fundamental Principles and Rights at Work*

How Does Baidu Conduct Product Content Governance?

Philosophy of governance

Baidu governs content on online platforms in accordance with all applicable laws and regulations of the place of operation and the place where products or services are provided. In addition, we conform to international norms in illegal information governance.

When the above-mentioned principles are followed, Baidu proactively promotes the circulation of content that is healthy, diverse in various forms, respects the content creators' right of publication and intellectual property rights (IPR), and protects users' freedom of opinion, expression, and access to information.

Baidu is diligent in undertaking social responsibility as a platform. While conducting content governance and by leveraging our powerful AI technologies, we quickly identify information that is detrimental to major public interests and important rights and interests of users. After undesirable content is identified, we will start the reporting mechanism promptly and conduct investigations in compliance with Baidu's data security and privacy protection requirements.

Governance standards

In accordance with relevant laws and regulations and taking the characteristics of products into account, Baidu has formulated a series of regulations on managing product content, including the *Baidu Content Ecosystem Management Standards*, the Baidu Risk Control Redlines for User Products, and the *Statement on Children's Personal Information Protection*. According to the above-mentioned regulations on product content management, Baidu has formulated the *Baidu Safety Review Standards*, which specifies that the compliance management of product content shall be conducted by a special department, and the standard shall be constantly optimized and iterated based on feedback from various channels, so as to enrich and update the database of samples of such standards.

Governance methods

Baidu has built a product content governance life-cycle management and control system¹ and established a complete process for the governance of content ecosystem with the aim of handling illegal information and minimizing circulation to avoid adverse effects.

100%
of customer appeals reviewed



Automatic content moderation

AI technology is leveraged to preliminarily filter information and identify highly-matched illegal content samples and then remove such samples directly.



Manual content moderation

Manual moderation is performed on suspected harmful content that is difficult for algorithms to judge, so as to improve moderation accuracy.



Appeal mechanism

The users of the content that is removed will be notified through messages sent via the platforms, and users will be given the right to appeal. After receiving such an appeal, the corresponding content will be reviewed on a case-by-case basis, with a completion rate of 100%.

Processes of content governance

¹According to the International Labor Organization (2017 data, not updated), there are 40.3 million "modern slaves" across the world, mostly victims of human trafficking who have been abducted and forced into prostitution or slavery.

¹For more details, see page 77, Baidu Environmental, Social and Governance (ESG) Report 2020.

Baidu removed over
69.524
million pieces of harmful
information through manu-
al content moderation

Baidu removed over
58.49
billion pieces through auto-
matic content moderation

Malicious websites of all
kinds have been intercepted
77.8

billion times to prevent
them from reaching users

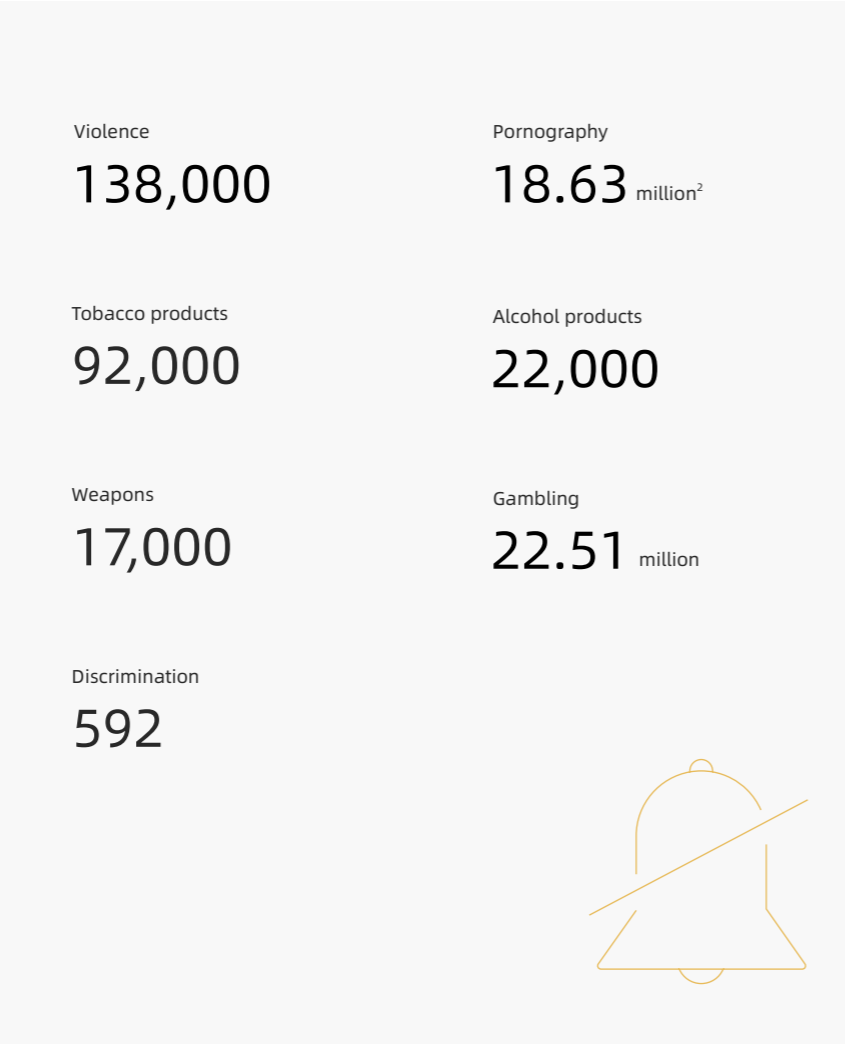
websites and apps involved
in fraud have been inter-
cepted

27 million times

Baidu has set corresponding performance evaluation metrics on content governance, such as contamination rate, remnant rate, automatic moderation rate, accuracy rate of manual moderation. Assessments are regularly conducted on these metrics to ensure the effectiveness of Baidu's content governance. On the third line of preventing risks¹, Baidu conducts special audits on content governance, and carries out special risk management and control measures on the governance of such information as pornography, gambling, and drugs.

Governance achievements

Baidu dutifully fulfills the obligation of public content governance, we crack down on various types of detrimental information on the Internet, and regularly releases data on the comprehensive governance of information security. In 2022, Baidu removed over 69.524 million pieces of harmful information through manual content moderation and over 58.49 billion pieces through automatic content moderation. Malicious websites of all kinds have been intercepted 77.8 billion times to prevent them from reaching users, while websites and apps involved in fraud have been intercepted 27 million times. Additionally, users' personal information has been protected from malicious disclosure on average 220,000 times per day.



Number of harmful information deleted by Baidu in 2022 (unit: pieces)

¹ For more information on "the third line", see section 1.3.1. How does Baidu prevent risks?

² In 2022, Baidu conducted special governance on harmful network ecology, focusing on upgrading the information mining and pornography strategy model for searching products.

What Are the directions of Baidu's Product Content Governance?

Actively fulfilling responsibilities as a platform, Baidu cracks down on various illegal content and conducts special governance actions. In 2022, Baidu added 10 new targets for crackdowns, including online trolls, violence, and rumors.

- False/fake information
- Defamatory/hateful/discriminatory speech
- Harassment
- Terrorism/incitement to violence
- Child sexual abuse and exploitation
- Illegal trading¹
- Piracy and infringement
- Other illegal information²

Examples of focuses of content governance

Governance of wildlife trafficking content

Baidu deleted 22,168 pieces of illegal information relating to stealing, unauthorized gathering, digging, selling and buying of rare and endangered wild plants and closed 124 accounts in 2022. In terms of trading of animals and their products, sales of hunting traps, hunting traps, shotguns, and electronic traps, 49,467 pieces of harmful information were deleted, and 372 accounts were suspended.

Governance of cyber violence content

In 2022, Baidu launched a special action to crack down on cyber violence. In the action, a cyber violence model strategy was developed to intercept harmful information by extracting common characteristics of harmful information, and continuously expanding the scope of blocked entries. In addition, illegal content and behaviors targeted at attacking and insulting others or specific groups are filtered and intercepted with the strategy of similar text recognition. For information in the forms of images and audios, images and voice recognition technologies are employed to identify and filter relevant illegal content, and our strategies are constantly optimized. In 2022, a total of 138,000 pieces of harmful information on cyber violence were identified and removed.



¹ Including trading of organs, people, drugs, weapons, knives, personal information.

² Including pornography, gambling and crimes.

Governance of online fraud content

By leveraging AI technologies for content detection and information extraction, Baidu identified dozens of pieces of intelligence clues related to "gray and black markets"¹, involving such illegal activities as police impersonation scams, Internet, email and mobile phone fraud, cross-border gambling, pornography, money laundering across the country, and assisting police in many places with their investigation into fraudulent crimes.

Case: AI Technologies' Facilitation of the Crackdown on "Black and Gray Markets"

Baidu has built a security situation awareness system based on the search ecosystem and content platforms by leveraging AI and big data on threat intelligence. The system is designed to conduct intelligent modeling and 24/7 real-time monitoring. We perform functions such as risk labeling, blocking prompts and search screening to intercept malicious websites, browsers, and apps, so as to prevent online "gray and black markets" from reaching users in the first instance.

Governance of content detrimental to minors

In terms of content identification, Baidu identifies, intercepts and filters information harmful to minors by leveraging the database of prohibited images, the database of keywords as well as relevant model strategies. We also shut down illegal accounts that release detrimental information.

In terms of the prevention of detrimental information, Baidu conducts protection of minors' publicity activities on products such as Baidu Search, Baidu Tieba, Baidu APP, Haokan Video, and calls on the whole society to strengthen the protection of minors. Baidu also will contact the police when any content involving illegal and criminal activities are identified.

Case: Special Action on the Protection of Minors

In 2022, Baidu removed 45,439 pieces of harmful information involving minors, closed 62 accounts and 6 communication forums in Baidu Tieba, and developed 4,768 keyword groups.

In the special action, special focus was given to the following aspects:

- Dealing with behaviors that infringe on the privacy of minors; investigate and crack down on online bullying behaviors; and removed a total of 29,474 pieces of inappropriate speech that would severely mislead minors.
- Cracking down on the use of "children's influencers" for profits or attracting users' attention by forcing minors to make lewd gestures or obscene, suggestive body movements. A total of 143 pieces of information involving minors' inappropriate movements were removed.
- Removing child porn novels and comics in a centralized manner. A total of 12,024 pieces of information involving luring minors to make bad friends and inciting negative emotions were removed.
- Strictly cracking down on and removed 3,798 pieces of information involving luring and instigating minors to take nude videos and pictures for online obscenity by leveraging social network platforms, groups, and intra-city channels.

¹ Refers to telecom fraud, phishing websites, Trojan viruses, hacker extortion and other illegal and criminal activities carried on the Internet.

How Does Baidu Leverage Advanced Technologies to Facilitate Product Content Governance?

As the world's largest Chinese search engine and a super platform connecting hundreds of millions of users, Baidu responds to huge search demands and carries a vast sea of information daily. As a result, Baidu is committed to leveraging AI technologies to conduct precise and efficient governance of illegal content. For the content ecosystem, Baidu upgraded and iterated over 100 automatic content moderation models in 2022, which are applied in over 20 products including Baidu Tieba, Baidu Wenku, and Baidu Zhidao.

For content that bypasses the content moderation strategies, Baidu leverages the Wenxin big model integrated with the text content security detection technology to improve and upgrade the traditional NLP model, becoming more effective and accurate in recognizing text and homophonic variants. In 2022, Baidu cracked down on tens of millions of illegal trading web pages suspected of stealing user privacy and personal information of citizens.



Texts

A million-word illegal entries vocabulary is employed at the bottom layer to conduct word and multi-mode search and matching. The application layer model is built on various dimensions based on the natural semantic recognition technology and is then applied to monitor content involving pornography, gambling, and fraud, to ensure the recall of prohibited information.



Images

A million-picture prohibited image database is employed at the bottom layer to recall potential similar images by similar image recognition, face recognition, incomplete face recognition, important logo detection. The capability of recognition of local features of potentially harmful content is also enhanced to identify content involving illegal activities, pornography, violence, and terrorism, so as to ensure the recall of prohibited content.



Videos

Such basic capabilities as key frame extraction, ASR audio-to-text conversion, and voiceprint recognition are employed at the bottom layer, combined with video understanding capabilities such as indecent actions and scene recognition in videos, are applied to detect content involving pornography, violence and terrorism, so as to ensure the recall of prohibited content.

Technologies applied to content governance



How Does Baidu Conduct Commercial Promotion Content Governance?

Management mechanism

Baidu has built a full life cycle management and control system¹ for the governance of commercial promotion content. The content management system for promoting business employs the "AI inspection + human double-check + human patrol" process. This system follows a full life cycle process that involves "pre-monitoring, instant interception, and post-tracing".

To ensure that commercial promotion content complies with relevant national laws and regulations, Baidu has formulated the *Baidu Management Measures on Commercial Advertisement*. This is applicable to different scenarios, in accordance with the *Advertisement Law of the People's Republic of China* and the *Anti-Unfair Competition Law of the People's Republic of China*. These measures are applicable to industries such as chemical and energy, real estate, and home furnishing, bags, and clothing.

Baidu's requirements on the advertisement of alcohol products

The *Baidu Management Measures on Commercial Advertisement* specifies that the following content shall be excluded from advertisements:

- Encouraging, advocating, enticing people to drink alcohol, or promoting unrestrained drinking.
- Drinking actions, scenes, as well as any related express or hints.
- Images of minors.
- Potentially dangerous activities such as driving a car, boat, plane.
- Any false indications or hints such as "removing tension and anxiety" and "increasing physical strength".
- Explicit or implied attribution of achievements in personal, business, social, athletic, sexual, or other aspects to alcohol use.
-

Technological capabilities



Texts

Establishing an efficient text judgment mechanism that is controllable, can be quickly intervened and is explainable by leveraging the business risk knowledge system, to improve the capability of identifying risks in texts.



Images

Developing capabilities of recognizing implicit risks in commercial promotion images by leveraging the learning capabilities of pre-trained big model machines.



The landing page²

Mainly developing capabilities of identifying gambling and telecom fraud to provide guarantees for the healthy development of the landing page ecosystem.

Technologies applied to commercial promotion content governance

Baidu's commercial promotion content governance saw remarkable upgrade and transformation in 2022. During the year, Baidu has effectively improved capabilities of fine-grained management and control of potentially harmful words, self-configuration of strategies, and computer-based auditing and control of audios and videos. The accuracy of content moderation was increased by over 50%. In 2022, 99.91% of harmful commercial promotion content was removed and the risk exposure rate of serious violations was 0.09%³.

AI algorithms had a daily capacity of moderating 15 billion pieces of content in 2022. Over 50 billion pieces of advertisements relating to pornography, gambling, fake information, and illegal medical information were filtered in 2022, an equivalent of 150 million per day. These achievements have contributed to the creation of a clean commercial advertising environment, safeguarding the rights and interests of users and enhancing user experience.

AI algorithms had a daily capacity of moderating

15

billion pieces of content in 2022

¹ For more details, see page 77, Baidu Environmental, Social and Governance (ESG) Report 2020.

² The landing page, or guide page, in online marketing refers to a web page that is displayed to potential users after clicking on an AD or using a search engine.

³ The risk exposure rate of serious violations equals 1 minus the removal rate of harmful commercial promotion content. Serious violations including endangering national security, improper commercial promotions, banned promotions, lack of qualifications.

5.2 User Experience

What User Service Guarantee System Does Baidu Set Up for Users?

Baidu has established a sophisticated user service guarantee system to improve user experience.

User

Baidu provides a 24/7 service for over one billion users, with an average of 500,000 responses delivered per day. The monthly-average response time of the customer service hotline is a maximum of 30 seconds, and the manual service response rate exceeds 85%.

Employee

- Setting goals: developing clear performance goals for all employees in the Service Experience Development Center¹ from three aspects: work efficiency, work quality, and codes of conduct.
- Performance monitoring: setting up a fully closed loop performance monitoring mechanism from three aspects: work efficiency, work quality, and codes of conduct.
- Regular evaluation: conducting monthly regular evaluations to standardize employee behaviors and improve service quality.

Product

Adding a mark identifying the official website in the search results to prevent false websites from infringing on users.²

Policy

- The Service Experience Development Center sends frequent complaints and data to business lines for their further optimization and improvement;
- The launch of the "Baidu Users' Rights and Interests Protection Plan". Any registered user suffering economic losses caused by fake official websites, qualification, or phishing fraud after clicking on a commercial promotion or a result marked with "guarantee" can apply to Baidu for compensation. In 2022, disputes involved a total of 3,347 merchants or advertisers with the "guarantee" mark. Among the total 16,256 disputes Baidu accepted, 10,775 were valid with sufficient evidence received compensation.
- The establishment of the Duyouyou Service Committee. The committee was initiated by the Baidu Service Experience Development Center. It is made up of experts from both inside and outside the industry as well as Baidu employees who value user experience are invited to supervise Baidu's service quality, study service strategies.
- The establishment of the the Duchacha Self-Disciplinary Committee, which encourages "participation of and supervision by all". By encouraging the public to engage in joint governance, Baidu efficiently handles the harmful information reported by users, and carries out special actions to handle serious issues.

¹ Established in 2002, the Baidu Service Experience Development Center functions as official customer service center for Baidu. It has been equipped with a sophisticated customer service system to provide customers and users with excellent service.

² For more details, see page 79, Baidu Environmental, Social and Governance (ESG) Report 2020.

How Does Baidu Manage User Complaints?



The establishment of the User Service Center¹

- Service types: including account security, protection of rights and interests, payment-related information and detrimental information.
- Products and services: including search service, navigation service, community service, game, entertainment, webmaster, developer service, and software tools.

The establishment of diversified user communication channels

Baidu is committed to responding to users' demands through multiple channels in a timely manner. We continuously optimize traditional channels such as complaint and reporting hotlines, reporting websites, reporting mailboxes, and reporting reception rooms, we also make efforts to build a modern cross-platform system.

Tiered system for handling complaints

By classifying users and the issues they complain, Baidu further refines service types according to different scenarios, to build a closed service loop where users' demands are responded to a level that meets their satisfaction. Major complaints can be responded in several minutes while all other complaints are handled within one working day.



¹ Baidu User Service Center-homepage (baidu.com)

5.3 Technological Innovation

How Does Baidu Improve Capabilities of Independent Innovation?

As a tech company, we continually improve our capabilities of independent innovation, improves user experience by leveraging technologies, and make the complex world much simpler.

Knowledge management and enterprise innovation

Baidu believes that leading AI technology and knowledge management are the core drivers of large-scale corporate innovation. Baidu infowork is an innovative work platform of the new generation that utilizes a product model resembling an assembly line. Its core is based on AI and knowledge management, and it establishes a functional matrix for the creation, accumulation, flow, and application of knowledge. It enhances the efficient flow of knowledge through unified search and intelligent recommendation systems, and facilitates the flow speed of enterprise knowledge assets and the innovation capability of all employees.

Incentive mechanisms for and practices of technological innovation

In 2022,over
70
IP training sessions were carried out around the company's key businesses

With over
3,500
participants

Mechanisms	Developing an IPR protection mechanism	<ul style="list-style-type: none">◦ Covering the entire life cycle of IPs, including IP training, patent application, patent quality management, patent incentives, IP litigation management, IP risk prevention and control, and patent operation management.
	Formulating the Baidu Group Patent Incentive Measures	<ul style="list-style-type: none">◦ Developing patent incentives: money rewards, honorary titles, and special incentives.◦ Baidu motivates those who directly participate in inventions and make creative contributions to the substantive characteristics of inventions and creations through patent incentives to encourage independent innovation.
	Establishing the "Baidu Top Award" incentive mechanism	<ul style="list-style-type: none">◦ Baidu set up the company's highest-level award – Baidu Top Award¹, in July 2010, with a bonus of one million US dollars, to encourage creation and innovation, and to let "small teams make big contributions". The Baidu Top Award is the highest award given to ordinary employees by Internet companies in China as of now, and 46 teams at Baidu have been winners of this award.
Practices	Carrying out IP training activities on a regular basis	<ul style="list-style-type: none">◦ Providing training on patent applications, quality improvement, and operational empowerment based on the requirements of corresponding technological and business characteristics to create a favorable atmosphere for IP innovation and protection.◦ In 2022, over 70 IP training sessions were carried out around the company's key businesses with more than 3,500 people participated.

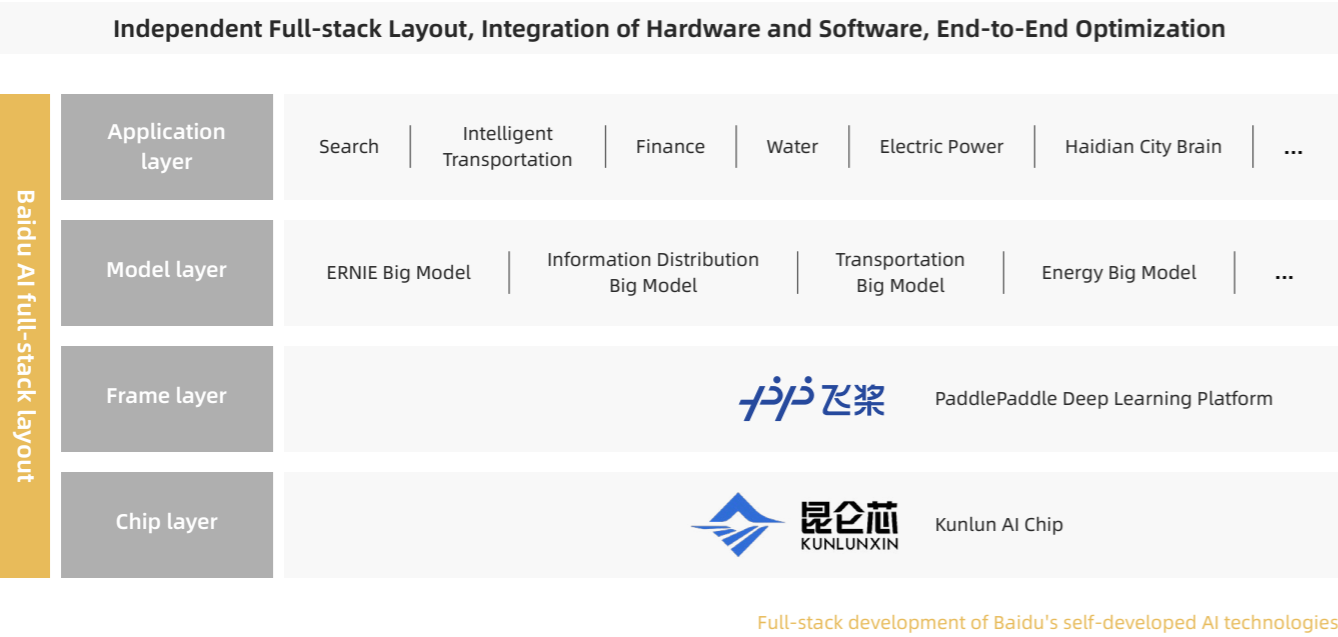
¹ Designed for ordinary employees (ranking below directors) who have made outstanding contributions to the company; awarded to a small team of fewer than 10 members.

The share of R&D investment in revenues reached

22%

R&D investment

The continuous advancement and breakthroughs that Baidu has made in AI technologies have been a result of continuous and intensive R&D investment. According to statistics, Baidu's annual R&D investment accounted for more than 15% of revenues in the past decade and the share reached 22% in 2022. Baidu is also one of the few AI companies worldwide that engage in full-stack development. It has key self-developed technologies in the AI chip layer, framework layer, model layer, and application layer.



How Does Baidu Respect Innovation Achievements and Protect IPR?

Baidu values IPR protection. Before launching key projects, Baidu will conduct Freedom to Operate (FTO)¹ investigations to prevent infringements. We have also set up smooth complaint mechanisms and reporting channels to handle IP-infringement products and content.

Baidu places great value on building a content ecosystem. In 2022, Baidu continued to provide off-site infringement monitoring and rights protection services for original programs and key authors. As a result, over 130,000 pieces of off-site copyright-infringement content were removed. Currently, more than 20 series of self-developed and co-created IPs, as well as over 200 authors have participated in Baidu's IP protection plan.

Baidu conducts patent cooperation with established industrial IPR operation platforms, including the Beijing Artificial Intelligence Industrial Intellectual Property Operation Center, the Artificial Intelligence Professional Committee, and the Artificial Intelligence Patent Pool of the Patent Protection Association of China. Through this cooperation, they share IPR and promote collaborative innovation among partners.

What Achievements Have Baidu Made in Terms of Patents?

Baidu applied for more than

4,000

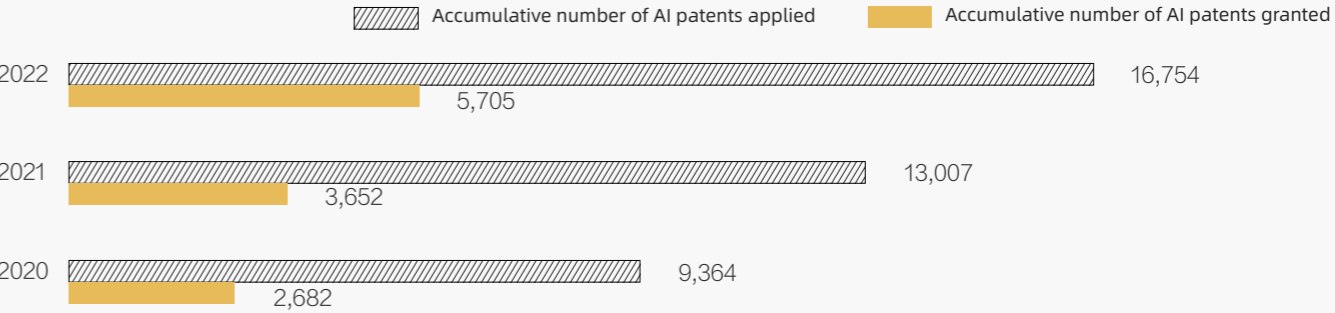
Chinese patents

with more than

2,700

granted

- In 2022, Baidu applied over 4,000 patents in China and was granted 2,700 of these.
- During the 23rd China Patent Award Selection in July 2022, Baidu was granted five awards – two silver medals and three excellence medals, covering fields such as autonomous driving, computer vision, natural language processing and mapping. Currently, Baidu has won 13 AI-related patent awards, ranking first in the cumulative number of high-level awards in the AI field.
- The *Analysis Report on China's Patented AI Technologies (2022)* was released by China's National Industrial Information Security Development Research Center and the Electronic Intellectual Property Center of the Ministry of Industry and Information Technology of the PRC in December 2022. According to this Report, Baidu ranked first for five consecutive years in the number of AI patent applications and patent quality (defined by high-quality patents and innovation-driving capacity) scored 92.21, ranking first in China.
- The Patent Association of China released the *Analysis Report on High-Value Patents in the field of Artificial Intelligence* in December 2022. The report showed that Baidu ranked first in China in the number of invention patents granted and the value of patents in three categories of AI basic algorithm, general technology, and intelligent application.
- According to the Patent Landscape Analysis Report released by Questel, the world's leading intellectual property solutions provider, in December 2022, Baidu ranked first worldwide with 1,193 high-level autonomous-driving patent families. In addition, Baidu's overall patent value was ahead of other innovation entities and we had the largest number of 'most influential' patents.



Total number of AI patents applied and granted (2020-2022)

¹ Freedom to Operate, or FTO for short, refers to the free use and development of technology and the marketing of products or services produced by the technology without infringing others' patent rights. FTO investigation report refers to the due diligence and legal opinions on whether the technology implemented by the enterprise infringes others' patent rights, and the analysis report on whether it infringes others' patent rights.



What New Progresses Has Baidu Made in Open-source Technologies?

Upholding the principle of "Everyone Can AI", Baidu actively provides open-source AI-related technologies and tools for developers as well as the general public. As of late 2022, Baidu had provided over 1,000 open-source projects on Github with over 20,000 community contributors and gained over 440,000 stars. The Apache ECharts, Apache Doris, and Apache bRPC projects donated by Baidu to the Apache Software Foundation, were upgraded to become Top-Level Projects of the Foundation in December 2020, June 2022, and December 2022. The number of contributors to the Apache Doris project reached more than 400. The open-source projects represented by the PaddlePaddle deep learning platform, and the Apollo autopilot platform have grown into the world's top open-source projects.

How Does Baidu Lead the Industry in Building an Innovation Ecosystem?

Case: PaddlePaddle Open-source Deep Learning Platform Facilitating the Development of the AI Industry

PaddlePaddle, China's first self-developed, open-source industrial deep learning platform with sophisticated features, is the result of Baidu's years of research and business application of deep learning technologies, integrated with a core framework, a basic model database, end-to-end development kits, and multiple tools. The platform has been widely used in various fields such as autonomous driving, smart industry, and finance, and holds the top position in the comprehensive market share of China's deep learning platforms. It serves a total of 5.35 million developers and 200,000 enterprises, creating 670,000 models. Moreover, PaddlePaddle has trained 4,300 teachers to teach AI in 1,044 universities and offered credit courses in 406 universities, with a total of 322 chief AI architects graduating from PaddlePaddle's AICA courses. As of 2022, PaddlePaddle had trained over 3 million AI talent.

Case: Apollo Open-source Platform Keeping Empowering Industrial Development

Apollo is an open, complete, and secure platform. It helps partners in the auto industry and the autonomous driving field to quickly build their own autonomous driving systems by connecting vehicles with hardware systems. Currently, Apollo has been upgraded and iterated to the 12th version - Apollo 8.0, with increased accessibility of the platform.

As the world's largest open platform for autonomous driving, Apollo has 220 partners. The Spark Project of Apollo launched a series of training courses for autonomous driving developers to empower Apollo's autonomous driving technical capabilities. In 2022, the total number of online learners of the courses reached 9,598, representing an average of 1,200 learners per session. In the future, Apollo hopes to drive the mutual benefits among developers, car manufacturers, and universities around the world through the open platform, thus benefiting human development.

Baidu is committed to building an open, inclusive, and mutually-inclusive AI ecosystem. Baidu led the effort in building the National Engineering Research Center for Deep Learning Technology and Application and was designed to focus on solving problems such as the weak foundation of AI development in China. Baidu's partners in the project include Tsinghua University, Beihang University, China Electronics Standardization Institute, and CAICT. This move contributes to the development of AI technologies and the industry as a whole in China.

5.4 Technological Empowerment

How Does Baidu's Technology Ensure the Safety of Autonomous Driving?

Safety is an indispensable part of autonomous driving. To this end, Baidu Apollo has built a three-tier security system comprised of single-vehicle intelligence, monitoring redundancy, and parallel driving based on Baidu's advantages in AI technology. At present, a total of 50 million kilometers of autonomous driving tests have been completed.

By leveraging the self-developed autonomous-driving architecture platform - "Apollo Galaxy", Apollo RT6 has developed a 100% car-level and full-vehicle redundant system. In terms of hardware, Apollo RT6 is equipped with a system comprised of seven redundancies including architecture redundancy, computing unit redundancy, and braking system redundancy. When any single component or system fails, the backup redundant systems can instantly work as a substitute. In terms of software, Apollo RT6 is equipped with a fault-diagnosing and risk-degrading system with vehicle + automatic driving systems integrated.

How Does Baidu's Technology Help Improve Urban Traffic?

To tackle urban traffic issues such as traffic congestion, frequent accidents, and parking difficulties, Baidu released the "ACE Intelligent Transportation Engine" together with supporting solutions, which employs terminal + cloud intelligent algorithms to build a modern intelligent transportation system and effectively solve traffic problems.

In 2022, leveraging the expertise in intelligent transportation, Baidu collaborated with Huangpu District in Guangzhou to develop the second phase of the ICV project. As part of this project, a public digital base was constructed and enhanced to support the emergence of a smart city. The goal of this effort was to improve travel efficiency for citizens and law enforcement activities for traffic police.

Increases travel efficiency

- The intersections of Science City and Knowledge City in Huangpu District have been equipped with Baidu's ICV solutions, among which 57% of them have completed the upgrade to self-organizing control mode, leading to a 20% decrease of average delay per vehicle at intersections and a 21% decline of time wasted for waiting for green lights at empty intersections. A "dynamic green light" traffic mode has been adopted at the intersections of six main roads including Kaichuang and Kaitai roads, which helped reduce the average travel time of the roads by 25% and the average number of stops at red lights from 3-4 times to 0-1.

Accelerates traffic law enforcement

- The innovative intelligent inspection system can automatically identify signal light failure, non-motor vehicle violations and illegal parking to guarantee a clear road.
- The commercial vehicle management platform is deployed to detect illegal or dangerous behaviors such as speeding, driving in the wrong direction, and drivers surfing on mobile phones in real-time, and automatically report them to the relevant authorities.

How Does Baidu's Technology Improve the Efficiency of Urban Governance?

The urban development scale and plans in China now are incompatible with the capacity of resources and ecological environment, which is manifested in such aspects as high energy consumption and carbon emissions of urban development and construction, and traffic congestion¹. Given this context, Baidu is dedicated to utilizing our expertise in cloud and intelligence to build complete urban digital transformation scenarios. Our aim is to gain a comprehensive understanding of cities, enable precise and refined urban governance, encourage high-quality industrial development, and offer targeted services that enhance people's livelihoods.

Baidu has built the "City Brain"² for Haidian District, which is designed to capture real-time data in different aspects in the district by leveraging AI technology. An example of this is the management of traffic violations by slag-dumping trucks. With the use of "City Brain", the system is able to process up to 1 million images of vehicles per day, resulting in a 30% increase in captured photos of slag-dumping trucks and a 95% identification rate of illegal features. Currently, the "City Brain" is connected to real-time data from more than 200,000 sensor devices and 29 streets in the district, with an average daily data flow of nearly 100 million pieces, thus supporting the advancement of smart governance in cities.



¹ Baidu White Paper on Urban Digital Transformation 2022



² Haidian "City Brain" - Baidu AI Cloud

How Does Baidu's Technology Help Improve the Efficiency of Financial Services?

As new business forms emerge and customers' demands diversify, the financial service industry in China is troubled by problems such as single service form and lack of digitalization and professionalism. Given this context, Baidu AI Cloud leverages AI capabilities to help build intelligent decision-making mechanisms and optimize business process experience, so as to improve financial service efficiency.

By integrating the sample data and risk control rules provided by banks with data obtained from online channels, Baidu has developed a credit risk-control blacklist. The solutions Baidu provided to bank customers have an average daily inquiry frequency of over 500,000 times, effectively ensuring desirable performances of borrowers with an undesirable performance rate of 10% lower than the industry average¹.

How Does Baidu's Technology Help Promote China's Space Exploration?

Scientific research in the aerospace field has the characteristics of low fault tolerance, high precision, and great difficulty, the Wenxin Big Model was designed to integrate, learn, analyze, and understand the data and knowledge of aerospace scientific research scenarios by leveraging AI technologies and thus helping to improve the efficiency of aerospace scientific research.

Baidu, together with the China Aerospace Science and Technology Corporation, released the world's first large-scale model in the aerospace field - "Aerospace-Baidu-Wenxin Big Model"². This model employs AI technologies to collect, analyze, and understand scientific research data to improve the efficiency and accuracy of scientific research efforts.



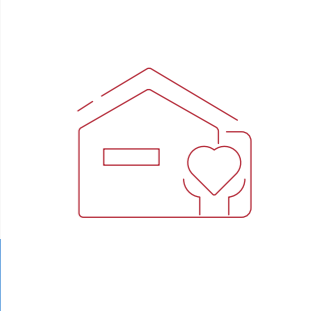
¹ Financial Modelling Product-Baidu AI Cloud



² Wenxin Big Model – industrial-level knowledge enhancement big model

06

Contributing to Society



Baidu consistently adheres to treating people with kindness, passing on love and care, and contributing to society. As a tech company with love and care in mind, Baidu upholds the social responsibility concept of "Do Better with Tech" and contributes to communities by leveraging industrial and technological advantages. For example, Baidu employs innovative technologies to solve social problems, thus creating a better life for the public.

6.1 Digital Inclusion

How Does Baidu Help the Vulnerable to Bridge the Digital Divide?

Minors

Baidu cares about the health and safety of minors. On the day when the revised *Law of the People's Republic of China on the Protection of Minors* came into effect, Baidu set up the "Minor Protection Hotline", which provides such services as safeguarding rights, online psychological counseling, and in-person legal education activities on campus. In 2022, the hotline accepted over 2,000 cases with a service satisfaction of over 97%. In 2022, Baidu also launched a special content management campaign with the aim of protecting minors, when inappropriate content and online behaviors that were harmful to the growth of minors were removed.

Case: Baidu Constructed the "Siye Clear Sky" Platform

In 2022, Baidu, working together with the Internet Society of China, launched "Siye Clear Sky"¹, which was designed as a public welfare communication platform for the protection of minors. Baidu launched the "Public Welfare Copyright, Build a Clear Sky Together" initiative. Baidu consistently brings high-quality content to the platform that supports the wholesome development of minors. The platform strives to expand the reach and scope of legal education content and offer free guidance to minors and their caretakers on various subjects, including legal knowledge, online safety, anti-bullying measures, and mental health. These efforts aim to enhance minors' understanding and competence in utilizing the internet, and promote equal access to digital resources among minors.

The elderly

2022 is the first year when China accelerated aging population and "suitability for the elderly" attracted much attention. Based on user demands and taking the facilitation of the elderly's adaptation to digital life as responsibility, Baidu has developed the Baidu App for the Elderly and set up special customer service hotline for both middle-aged and elderly people. These efforts aim to offer convenience for the elderly in their daily life and to foster barrier-free information experience.

Case: Baidu App for the Elderly Enabling Senior Citizens to Bridge the Digital Divide

The design of the App takes the physical and psychological demands of the elderly into full account.

- **Visual design:** the enlarged font sizes and multiple warm-toned colors will offer users more vitality and enthusiasm.
- **Volume design:** different options of speech speed and the increased upper limit of volume will offer more convenience to users.
- **Layout design:** the enlarged touch area and simpler and easier-to-understand icons and descriptions will provide easier access to the App.
- **Voice functions:** The voice search function is provided on the App. Cantonese, Sichuan dialect as well as other dialects can also be recognized and the search results will be automatically read out, thus users can obtain information only by saying a few words.



¹ The "Siye Clear Sky" platform

The hearing-impaired

The number of the hearing impaired in China has now exceeded 27.8 million, however, that of professional sign language interpreters is less than 10,000 and the needs of people with hearing impairment are urgently to be met. This huge gap exposes their urgent needs. In March 2022, Baidu AI Cloud Xiling officially released the "AI Sign Language Platform", on which such features as sign language synthesis videos and sign language anchor's real-time broadcasting can "narrate" news for hearing-impaired users. Baidu also launched the "AI sign language platform all-in-one" device, which is plug-and-play and user-friendly. The device can be scaled up in hospitals, banks, stations, and other public places to help hearing-impaired users enjoy daily services and meet basic living needs.



Agricultural laborers

Baidu sticks to promoting urban and rural areas to share digital dividends and create a digital future together. Baidu cares about the life and well-being of residents in rural areas, the development of remote areas, and is committed to improving traditional agriculture through digital technology so as to inject digital momentum into rural vitalization.

Case: Baidu Leveraging AI Technologies to Help Farmers

In 2022, Baidu, together with the provincial government of Henan, China Science Communication and other organizations, jointly held live broadcasts to help farmers. During a live broadcast, Baidu digital human Du Xiaoxiao, by leveraging the AI sound recognition feature on the PaddlePaddle, demonstrated the ability to accurately identify the ripeness of honeydew melons. This can effectively help fruit farmers reduce losses caused by misjudgments. In addition, based on PaddlePaddle, a team from the Inner Mongolia University of Technology developed an automatic monitoring system for lambing delivery. The system can monitor the status of the ewes in real time through the camera, and promptly notify farmers through alarms on their mobile phones, effectively reducing the workload of herdsmen and improving the survival rate of lambs.

Through technological innovation, Baidu has effectively helped farmers increase production and income, while boosting agricultural development with digital technology.

How Does Baidu Promote Equity in Digital Education?

Empower
4,300
college teachers with AI education

Funded a total of
37
young scientists

Jointly organized
14
Deep Learning teachers training sessions

Creating an open and equal educational platform

Baidu believes that fair education is an important driver for social sustainability. To offer equal digital education opportunities to people of different ages, regions, and cultural backgrounds, Baidu established the Pine Cone Academy¹. The Pine Core Academy gathers various resources to safeguard developer's AI learning and practices at all phases. Baidu also collaborates with the Ministry of Education of the PRC (MoE) and industry associations to actively conduct cooperative education projects, so as to provide different groups with training models suitable for them.

Partner	Achievement
Ministry of Education	Provided AI education support to 4,300 college teachers in 511 projects from 242 universities
China Computer Federation (CCF)	Funded a total of 37 young scientists
The Alliance of Emerging Engineering Education for Information Technologies	Jointly organized 14 Deep Learning teachers training sessions and 16 Intelligent Connected Vehicle (ICV) teachers training sessions

Fostering an equal educational ecology

Baidu values digital education, including AI education. We are committed to leveraging digital platforms to empower industry-education integration and industry-academy cooperation, to cultivate modern digital talent. Baidu continually expands access to AI technology courses, develops easy-to-understand courses, breaks the limitations of traditional online learning platforms, and meet the "Digital Inclusion Benchmark" proposed by the World Benchmark Alliance.

Case: Baidu Providing AI Learning Opportunities for Teenagers

Baidu has designed easy-to-understand teaching materials and courses to stimulate primary and middle school students' interest in AI to promote children and youth AI knowledge learning and ability assessment system building.

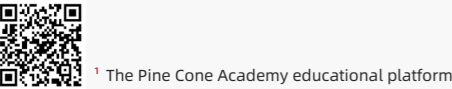
Developing AI courses for teenagers:

After pilot testing, Baidu, in collaboration with Beijing Digital Education Center, Southwest University, and Beijing No. 15 Middle School (Nankou), opened AI comprehensive literacy courses in 2022 to help students gain an in-depth understanding of the impact of AI on society.

Baidu publishes extracurricular books for primary and secondary students such as *Learning AI with Monkey King*, *Enthusiastic Learners' AI Guide* and *Jiang Ziya Practicing AI*, which, combined with Baidu's EasyDL – an AI development platform for beginners, enables teenage beginners to get started with programming principles quickly. The above mentioned three series of popular science books have been selected as the designated books for the "National Youth AI Application and Innovation Ability Level Evaluation".

Participating in formulating standards:

In 2022, Baidu participated in the preparation of the Standards for National Youth Artificial Intelligence Application and Innovation Ability Evaluation (2021 Edition) , as well as creating an close-loop AI talent training structure of "textbook-course-evaluation standards". Given that the evaluation standards are graded and comprehensive, teenagers can accurately formulate their own learning goals. In compliance with the standards, Baidu develops courses at corresponding levels, so as to complete the entire learning cycle.



¹ The Pine Cone Academy educational platform

6.2 Community Development

How Does Baidu Spread Love and Care to Every Corner of Society?

Youth Education

Upholding the social responsibility concept of "Do Better with Tech", Baidu eyes to address social issues with innovative technologies to honor social responsibility as an enterprise citizen and strive to create a better future for global users.

Case: Digital Human Du Xiaoxiao Invited as Public Welfare Ambassador for the Red Cross Society of China

The Red Cross Society of China has invited Du Xiaoxiao, the digital human launched by Baidu, as its public welfare ambassador. In the project of safety education for 300 primary and secondary schools in Henan Province, Du Xiaoxiao helped to spread safety protection measures and knowledge on the prevention of campus violence, sexual assault, self-injury, drowning, disasters, and accidents.



Case: "Hello World" Helping Children in the Mountainous Areas Step Out of the Mountains and Into a Larger World

In 2022, Baidu continued to invest in the "Hello World" public welfare program and approached 30 primary and secondary schools located in Southwest and Northwest China.

The program is designed to help children in remote areas get out of poverty and embrace a bright future. In 2022, the Baidu Foundation in collaboration with the China Football Sports School of Beijing Sport University leveraged the rich industry resources and professional capabilities of Baidu B2B to purchased high-quality football training equipment for the schools and trained the relevant PE teachers.

Besides stimulating their enthusiasm for sports, Baidu also hopes that children can still learn about the outside world through reading. Hence, Baidu donated over 5,000 books on topics such as natural sciences, world classics, and English books for local teenagers to inspire them to embrace a wider world.



Combating COVID-19

Together, difficulties can be tided over. During the difficult days, Baidu has been constantly upgrading Apps and services by leveraging industrial and technological advantages, so as to offer help to people in need to help them overcome difficulties together.

The "Epidemic Index" feature on Baidu App:

"Baidu Epidemic Search Index" and "Baidu Health Inquiry Index" covered over 360 cities.

To better inform the public of the information on COVID-19 developments and their health conditions, Baidu App added the "Epidemic Index" feature and launched the "Baidu Health Inquiry Index" and the "Baidu Epidemic Search Index", which has provided importance references for the analysis and determination of the COVID-19 trends.

- Baidu Epidemic Search Index: A line chart was drawn by collecting and analyzing users' search and discussions on epidemic-related topics, which clearly reflects attention of the public on symptoms and changes in their demands for prevention supplies.

- Baidu Health Inquiry Index: The Index was produced by collecting data such as the number of consultations from local users referring to the respiratory department in Baidu Health, which can help relevant departments and users understand the current status of the epidemic.

Moreover, epidemic response guidelines and medication guides were also available on the "Epidemic Index" page to help users develop and implement the concept that everyone is the primary person responsible for his/her own health, supporting all-out efforts to combat COVID-19 in a scientific manner.

Public Healthcare

As China ages, public demand for medical services continues to grow and the compound growth rate of per capita expenditure on healthcare has reached 7.1%, higher than that of the country's GDP of 6.4%¹. In this context, Baidu through bottlenecks and explore medical application scenarios for AI technologies to provide smart medical solutions.

Case: Lingyi Zhihui Facilitates the Improvement of Primary Healthcare

Against the background of unevenly distributed medical resources and poor diagnosis and treatment abilities of primary healthcare in China, Baidu launched the AI-enabled medical platform –Lingyi Zhihui², where medical knowledge and data are integrated. This provides support for medical decisions in various medical scenarios enabling primary medical institutions to have access to high-quality medical knowledge. Currently, Lingyi Zhihui has reached more than 600 hospitals and over 3,400 primary medical institutions in 31 provinces and municipalities, effectively empowering primary medical institutions to improve their diagnosis and treatment capabilities.

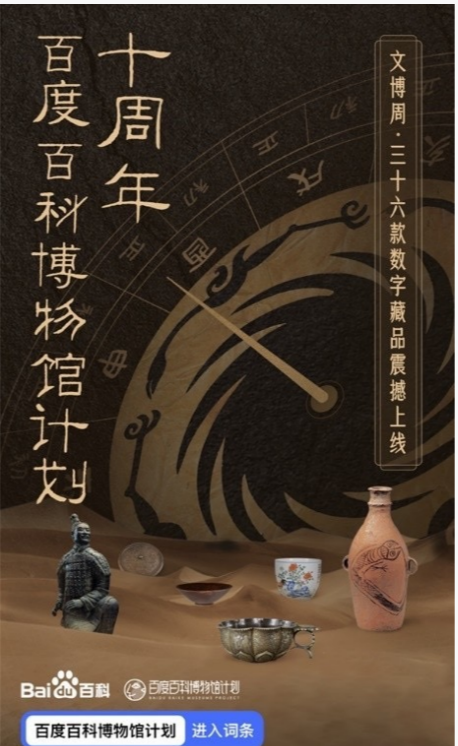
Baidu is committed to safeguarding traditional cultural heritage and promoting traditional culture with innovative technology and various forms of activities.

How Does Baidu Leverage Technology to Protect and Promote Culture?

Case: Baidu Digital Museum Project Revitalizes Cultural Relics

The year 2022 marks the 10th anniversary of the "Baidu Digital Museum Project". On May 18, the International Museum Day, the project, together with 12 cultural institutions and museums, held the "Digital Collections Museum Week" activity. The event features the combination of Baidu' s AIGC technology and traditional cultural created a special interaction channel for participants to meet thousand-year-old cultural relics.

Aside from the digital collections it provided, the project also reached cooperation with 596 museums across the globe and drawn digital relics maps by using digital technology where information of over 25,000 collections was enlisted. The combination of rich digital collections and easy access enables users to visit museums across the country.



Digital collections and professional knowledge provided at the 10th anniversary of the Baidu Digital Museum Project



¹ Medical Knowledge Platform White Paper



² Ai-enable platfrom Lingyi Zhihui



In 2022, Baidu donated
66,000
doses of antigen reagents
5,000
pieces of protective clothing
and
5,000
sets of technological facilities
to the frontline of Beijing's
fight against COVID-19

Baidu Health:

To ease public anxiety during the difficult times, Baidu Health, in collaboration with over 60 professional doctors, provided 200 sessions of live broadcasts hosted by doctors and 34 sessions of live broadcasts where doctors and patients communicated through voice chat. We have also prepared in advance over 1.5 million anti-epidemic supplies on Baidu Health for the sake of public health protection.

Baidu Maps:

"Map of PCR test sites", "Map of fever clinics" and other features were added on Baidu Maps to provide information on combating COVID-19 for users in a timely manner by leveraging big data and map-drawing algorithms. The search list of pharmacies and other important facilities were added to meet public demand. Such services as online medical consultation and medicine purchase are also accessible to users.

Baidu B2B:

In 2022, Baidu donated 66,600 doses of antigen reagents, 5,000 pieces of protective clothing, and 5,000 sets of technological facilities to the frontline of Beijing's fight against COVID-19. By leveraging the high-quality supply chain resources boasted by b2b.baidu.com, Baidu acted quickly to deliver the supplies to the frontlines.

How Does Baidu Empower Universities in AI Talent Training?

As the main institution for training AI professional talent, universities are deeply valued by Baidu. By fully leveraging our advantages in industrial experience and resources, we provide learning platforms and resources for universities, empowering them to cultivate AI talent.

Case: Baidu Helps Expand Universities' Capabilities of AI Talent Training

Baidu has established strong cooperation ties with many universities to create sophisticated AI learning systems. The AI courses we provide are designed with full consideration of the application scenarios of the industry and we aim to provide complete training courses for students who want to learn AI technology.

Textbook compilation

Baidu, in collaboration with Tsinghua University Press, published the first series of AI textbooks in China. As of 2022, *Machine Learning Practice*, *Natural Language Processing Practice*, *Computer Vision Practice* as well as other textbooks formulated by Baidu had been used by over 1,300 teachers in more than 700 universities in China. In addition, the *Autonomous Driving Technology Series of Books* jointly published by Beihang University, Baidu's Intelligent Driving Group (IDG), and Baidu Institute of Technology have helped more readers understand and learn advanced achievements in the field of autonomous driving.

On-campus competitions

So far, Baidu has held 18 sessions of the Baidu Star Competition, 8 sessions of the International Big Data Competition and 5 sessions of the Computer Competition in Chinese Universities-Artificial Intelligence Creative Competition. Baidu is also the sponsor, or organizer, of many other competitions such as the National Smart Car Competition for College Students, the Chinese College Students Computer Design Contest, and the National Robotics Competition for College Students (RoboMaster). We hope to stimulate students' enthusiasm and proactivity in AI learning and innovation through further competitions.



How Does Baidu Contribute to the Digital Transformation of SMEs?

Small and Medium sized Enterprises (SMEs) play an irreplaceable role in promoting economic growth, advancing technological innovation, and generally improving people's livelihood. Baidu contributes to the digital transformation of SMEs by leveraging digital advantages and guiding them to participate in industry exchanges and cooperation to achieve common development.

Case: "Smart Purchase, Common Prosperity" Helps Enterprises Achieve Digital Transformation

We launched the "Smart Purchase, Common Prosperity" series of activities in 2022 to conduct close exchanges with SMEs and pass on our experience in digital transformation. Responding to the common challenges of reducing costs and increasing efficiency faced by SMEs, Baidu considered local advantages and conducted trainings to improve SMEs digital capabilities. Baidu also empowered SMEs across the nation by providing supports in online promotion and business opportunities.

Case: Injecting New Vitality into the Development of Small Businesses

In 2022, Baidu employed platform advantages to conduct various initiatives such as the "Remarkable Change" contest and the *Hello, Factory Manager!* documentary. These events served to provide entrepreneurs in diverse fields with innovative marketing strategies and efficient transformation opportunities.



Case: Promoting Digital Upgrading of Industries in Cooperation with Xiamen Industrial Exposition

In 2022, Baidu reached strategic cooperation with Xiamen Industrial Exposition and held over 20 forums and seminars, where more than 1,500 quality brands from different industries both domestic and international were brought together. These efforts further accelerated the integration of the real industry and the digital economy and boosted the digital upgrade of industries.



Strategic cooperation agreements signing ceremony between Baidu and Xiamen Industrial Exposition

How Does Baidu Promote Biodiversity Protection by Leveraging the Advantages of Platforms?

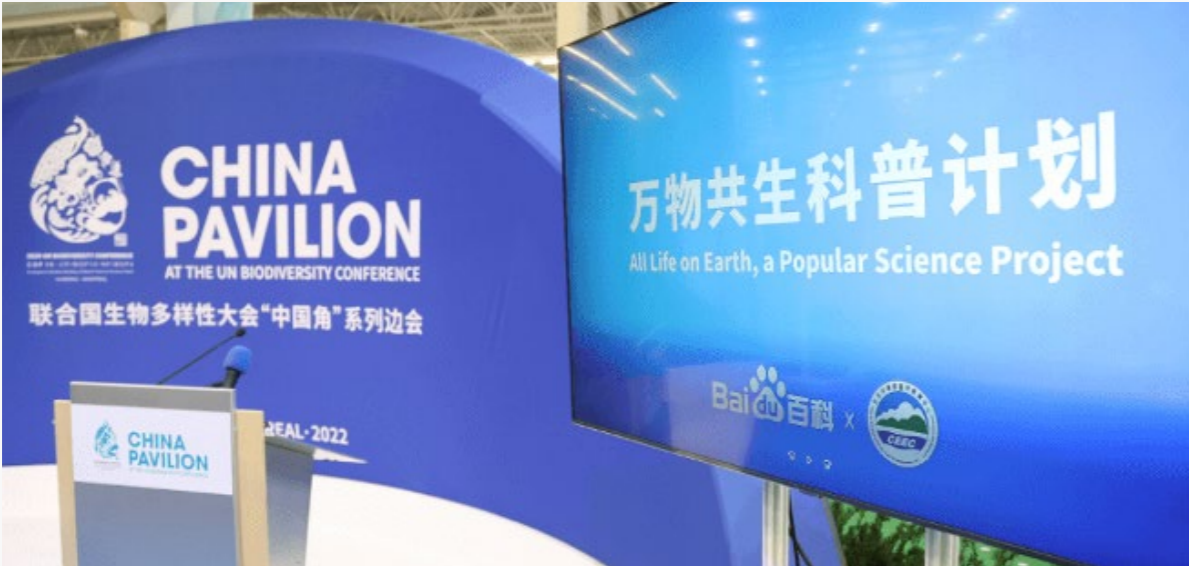
Following the concept of "working together to build a community of all life on earth", Baidu has always been at the forefront of protecting green mountains and blue waters and has been facilitating ecological protection and promoting the concept through technological innovation.

Case: Baidu Zhidao Establishes Strategic Partnership with CBCGDF

In May 2022, Baidu Zhidao signed the strategic cooperation agreement with China Biodiversity Conservation and Green Development Foundation (CBCGDF). The two entities are expected to cooperate in fields such as biodiversity, wildlife protection, and environmental protection in the form of jointly providing answers to related online questions as well as spreading correct information and concepts of animal protection to the public.

Case: Baidu Baike Attends the Second Part of COP15

In 2022, Baidu Baike attended the second phase of the 15th meeting of the Conference of the Parties for the United Nations Convention on Biological Diversity, otherwise known as COP15. At the "China Pavilion" series of side events, Baidu shared the experience in promoting ecological protection through technological innovation, displayed the achievements of the "All Life on Earth" popular science project and a rich content digital matrix of animals and plants to provide insights for the industry to participate in biodiversity protection. Baidu Baike, in conjunction with the Publicity and Education Center of China's Ministry of Ecology and Environment, launched the popular science project through live broadcasts, science-popularizing videos, and specific entries¹, so as to contribute to the protection of endangered animals and plants as well as biodiversity.



The "All Life on Earth" popular science project displayed by Baidu at the China Pavilion of COP15



¹ The "All Life on Earth" popular science project

Appendix

HKEX ESG Index

ESG Indicator	Location
Environmental	
A1 Emissions	
General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer	P58
A1.1 The types of emissions and respective emissions data.	P58-59
A1.2 Direct (Scope 1) and energy indirect (Scope 2) greenhouse gas emissions (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P58
A1.3 Total hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P59
A1.4 Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P59
A1.5 Description of emissions target(s) set and steps taken to achieve them.	P55, P58-63
A1.6 Description of how hazardous and non-hazardous wastes are handled, and a description of reduction target(s) set and steps taken to achieve them.	P63
A2 Use of Resources	
General Disclosure Policies on the efficient use of resources, including energy, water and other raw materials.	P58
A2.1 Direct and/or indirect energy consumption by type (e.g. electricity, gas or oil) in total (kWh in '000s) and intensity (e.g. per unit of production volume, per facility).	P58
A2.2 Water consumption in total and intensity (e.g. per unit of production volume, per facility).	P59
A2.3 Description of energy use efficiency target(s) set and steps taken to achieve them.	P60-63
A2.4 Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency target(s) set and steps taken to achieve them.	P61-62
A2.5 Total packaging material used for finished products (in tonnes) and, if applicable, with reference to per unit produced.	Not applicable

ESG Indicator	Location
A3 The Environment and Natural Resources	
General Disclosure Policies on minimising the issuer's significant impacts on the environment and natural resources.	P58
A3.1 Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	P60-70
A4 Climate Change	
General Disclosure Policies on identification and mitigation of significant climate-related issues which have impacted, and those which may impact, the issuer.	P55
A4.1 Description of the significant climate-related issues which have impacted, and those which may impact, the issuer, and the actions taken to manage them.	P55-56
Social	
B1 Employment	
General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to compensation and dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, anti-discrimination, and other benefits and welfare	P45, P52
B1.1 Total workforce by gender, employment type (for example, full- or part-time), age group and geographical region.	P38
B1.2 Employee turnover rate by gender, age group and geographical region.	P38
B2 Health and Safety	
General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to providing a safe working environment and protecting employees from occupational hazards.	P47-49
B2.1 Number and rate of work-related fatalities occurred in each of the past three years including the reporting year.	P49
B2.2 Lost days due to work injury.	P49
B2.3 Description of occupational health and safety measures adopted, and how they are implemented and monitored.	P47-49
B3 Development and Training	
General Disclosure Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.	P40-43

ESG Indicator	Location
B3.1 The percentage of employees trained by gender and employee category (e.g. senior management, middle management).	P43
B3.2 The average training hours completed per employee by gender and employee category.	P43
B4 Labour Standards	
General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to preventing child and forced labour.	P45
B4.1 Description of measures to review employment practices to avoid child and forced labour.	P45
B4.2 Description of steps taken to eliminate such practices when discovered.	P45
B5 Supply Chain Management	
General Disclosure Policies on managing environmental and social risks of the supply chain.	P18
B5.1 Number of suppliers by geographical region.	P19
B5.2 Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, and how they are implemented and monitored.	P18-19
B5.3 Description of practices used to identify environmental and social risks along the supply chain, and how they are implemented and monitored.	P18-19
B5.4 Description of practices used to promote environmentally preferable products and services when selecting suppliers, and how they are implemented and monitored.	P18-19
B6 Product Responsibility	
General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to health and safety, advertising, labelling and privacy matters relating to products and services provided and methods of redress.	P72-73, P78
B6.1 Percentage of total products sold or shipped subject to recalls for safety and health reasons.	N/A
B6.2 Number of products and service-related complaints received and how they are dealt with.	P80

ESG Indicator	Location
B6.3 Description of practices relating to observing and protecting intellectual property rights.	P83-84
B6.4 Description of quality assurance process and recall procedures.	P72-78
B6.5 Description of consumer data protection and privacy policies, and how they are implemented and monitored.	P31-34
B7 Anti-corruption	
General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to bribery, extortion, fraud and money laundering.	P15
B7.1 Number of concluded legal cases regarding corrupt practices brought against the issuer or employees during the reporting period and the outcomes of the cases.	P17
B7.2 Description of preventive measures and whistle-blowing procedures, and how they are implemented and monitored.	P17
B7.3 Description of anti-corruption training provided to directors and staff.	P16
B8 Community Investment	
General Disclosure Policies on community engagement to understand the needs of the communities where the issuer operates and to ensure activities take into consideration the communities' interests.	P90-98
B8.1 Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport).	P89-98
B8.2 Resources contributed (e.g. money or time) to the focus area.	P93

GRI Content Index

Statement of use	Baidu has reported in accordance with the GRI Standards for the period [January 1, 2022 to December 31, 2022].
GRI 1 used	GRI 1: Foundation 2021

GRI Standard	Disclosure	Location
GRI 2: General Disclosures 2021	2-1 Organizational details	P02-03
	2-2 Entities included in the organization's sustainability reporting	About This Report
	2-3 Entities included in the organization's sustainability reporting	About This Report
	2-4 Restatements of information	About This Report
	2-5 External assurance	P109
	2-6 Activities, value chain and other business relationships	P37-54
	2-7 Employees	P37-50
	2-8 Workers who are not employees	P18-19
	2-9 Governance structure and composition	P12-13
	2-10 Governance structure and composition	P12-13
	2-11 Chair of the highest governance body	P13
	2-12 Role of the highest governance body in overseeing the management of impacts	P12
	2-13 Delegation of responsibility for managing impacts	P12
	2-14 Role of the highest governance body in sustainability reporting	P12
	2-15 Conflicts of interest	P15-17
	2-16 Communication of critical concerns	P08
	2-17 Collective knowledge of the highest governance body	P13
	2-18 Evaluation of the performance of the highest governance body	P13
	2-19 Remuneration policies	P45
	2-20 Process to determine remuneration	P12, P45

GRI Standard	Disclosure	Location
GRI 2: General Disclosures 2021	2-22 Statement on sustainable development strategy	P11
	2-23 Policy commitments	P12
	2-24 Embedding policy commitments	P12
	2-25 Processes to remediate negative impacts	P17
	2-26 Mechanisms for seeking advice and raising concerns	P17
	2-27 Compliance with laws and regulations	P15
	2-28 Membership associations	P17, P30
	2-29 Approach to stakeholder engagement	P8-9
	2-30 Collective bargaining agreements	P8, P53
GRI 3: Material Topics 2021	3-1 Process to determine material topics	P9
	3-2 List of material topics	P9
	3-3 Management of material topics	P9
GRI 201: Economic Performance	201-1Direct economic value generated and distributed	P45
	201-2 Financial implications and other risks and opportunities due to climate change	P56
	201-3Defined benefit plan obligations and other retirement plans	P45-56
	201-4Financial assistance received from government	P15
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	P93
	203-2 Significant indirect economic impacts	P96
GRI 204: Procurement Practices	204-1 Proportion of spending on local suppliers	P18
GRI 205: Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	P17
	205-2 Communication and training about anti-corruption policies and procedures	P17
	205-3 Confirmed incidents of corruption and actions taken	P17
GRI 206: Anti-competitive Behavior 2016	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	P17
GRI 301: Materials 2016	301-2 Recycled input materials used	P19
	301-3 Recycled input materials used	P19











GRI Standard	Disclosure	Location
GRI 302: Energy 2016	302-1 Energy consumption within the organization	P58
	302-2 Energy consumption outside of the organization	P58
	302-3 Energy intensity	P58
	302-4 Reduction of energy consumption	P58-61
	302-5 Reductions in energy requirements of products and services	P58-61
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	P61
	303-2 Management of water discharge-related impacts	P61
	303-3 Water withdrawal	P59
	303-4 Water discharge	P59
	303-5 Water consumption	P59
GRI 304: Biodiversity 2016	304-2 Significant impacts of activities, products and services on biodiversity	P98
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	P58
	305-2 Energy indirect (Scope 2) GHG emissions	P58
	305-3 Other indirect (Scope 3) GHG emissions	P58
	305-4 GHG emissions intensity	P58
	305-5 Reduction of GHG emissions	P58
GRI 306: Waste 2020	306-1 Waste generation and significant waste-related impacts	P63
	306-2 Management of significant waste-related impacts	P63
	306-3 Waste generated	P59
	306-4 Waste diverted from disposal	P63
	306-5 Waste directed to disposal	P63
GRI 308: Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	P19
	308-2 Negative environmental impacts in the supply chain and actions taken	P18-19
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	P38
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	P45-46
	401-3 Parental leave	P46

GRI Standard	Disclosure	Location
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	P47-49
	403-2 Hazard identification, risk assessment, and incident investigation	P47-49
	403-3 Occupational health services	P47-49
	403-4 Worker participation, consultation, and communication on occupational health and safety	P47-49
	403-5 Worker training on occupational health and safety	P47-49
	403-6 Promotion of worker health	P47-49
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	P47-49
	403-8 Workers covered by an occupational health and safety management system	P47-49
	403-9 Work-related injuries	P49
	403-10 Work-related ill health	P47-49
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	P43
	404-2 Programs for upgrading employee skills and transition assistance programs	P40-43
	404-3 Percentage of employees receiving regular performance and career development reviews	P40
GRI 405: Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	P50-51
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	P50-51
GRI 407: Freedom of Association and Collective Bargaining 2016	407-1 Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	P50
GRI 408: Child Labor 2016	408-1 Operations and suppliers at significant risk for incidents of child labor	P19
GRI 409: Forced or Compulsory Labor 2016	409-1 Operations and suppliers at significant risk for incidents of forced or compulsory labor	P19
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	P93-94
	413-2 Operations with significant actual and potential negative impacts on local communities	/
GRI 414: Supplier Social Assessment 2016	414-1 New suppliers that were screened using social criteria	P19
	414-2 Negative social impacts in the supply chain and actions taken	P18-19
GRI 416: Customer Health and Safety 2016	416-1 Assessment of the health and safety impacts of product and service categories	P73-76


SASB Standard

Topic	Accounting Metric	Code	Location
Environmental Footprint of Hardware Infrastructure	(1)Total energy consumed; (2) percentage grid electricity; (3) percentage renewable	TC-SI-130a.1	P58
	(1)Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	TC-SI-130a.2	P59
	Discussion of the integration of environmental considerations into strategic planning for data center needs	TC-SI-130a.3	P60-61
Data Privacy & Freedom of Expression	Description of policies and practices relating to behavioral advertising and user privacy	TC-SI-220a.1	P22-28, P72-73, P78
Data Security	(1)Number of data breaches; (2)Percentage involving personally identifiable information (PII); (3)number of users affected	TC-SI-230a.1	P31-34
	Description of approach to identifying and addressing data security risks, including use of third-party cybersecurity standards	TC-SI-230a.2	P22-36
Recruiting & Managing a Global, Diverse & Skilled Workforce	Employee engagement as a percentage	TC-SI-330a.2	P51
	Percentage of gender and racial/ethnic group representation for (1)management; (2)technical staff, and (3)all other employees	TC-SI-330a.3	P51
Managing Systemic Risks from Technology Disruptions	Description of business continuity risks related to disruptions of operations	TC-SI-550a.2	P24-25, P56

UNSDGs Contributions

Key SDG responded	Our Commitments and Main Actions	Location
	Continuously improving the occupational health protection and safety management system, providing employees with recreational and medical consultation services, and protecting their physical and mental health; Launching smart medical products such as Baidu Health (a one-stop health management platform) and Baidu Lingyi Zhihui (an AI-powered healthcare brand) to empower primary healthcare with AI technologies and improve inclusive healthcare.	Talent Protection
		Community Development
	Prioritizing digital education, committed to empower industry-education integration and industry-academia cooperation by relying on digital platforms, providing high-quality educational resources, guaranteeing AI learning and practice for the public, comprehensively improving digital skills, and accelerating the cultivation of digital talent.	Digital Inclusion
	Attaching importance to the rights and interests of female groups, ensuring equal opportunities for women strictly upholding the principle of equal pay for equal work, and caring for the development of female employees.	Workforce Diversity
	Building green data centers with high efficiency and low energy consumption, innovating green technologies, optimizing energy use structure, providing clean and low-carbon cloud services for society, and injecting green forces into the era of smart economy.	Green Operations
	Providing employees with competitive pay packages, adopting incentive modes combining short-time and long-term incentives, and improve employees' welfare.	Talent Protection
	Pursuing the concept of "EverByone Can AI", promoting the open-source sharing of AI-related technical tools and ensuring easy access to the world's most advanced AI technologies for the society as a whole to stimulate creative vitality; Building all scenarios to drive urban digital transformation through "Integrating Cloud and AI, realizing fine governance of the city and high-quality industrial development; Promoting the integration of the real industry and digital economy through in-depth cooperation with enterprises, supporting the digital upgrading of industries and realizing common development.	Technological Innovation
		Technological Empowerment
	Empowering urban construction with science and technology backed by AI technologies, monitoring and analyzing urban operations through "intelligent+" models, and supporting sustainable development of cities and communities.	Green Products and Services
	Adopting green practices based on emission reduction pathways in data centers, office buildings, carbon offsetting, intelligent transportation, AI cloud, and supply chain, and striving to help the society save energy and reduce emissions through green technologies while achieving carbon neutrality target at the operational level.	Promoting Green Ideas
	Adhering to legal compliance as the foundation of corporate governance, building a scientific and efficient corporate governance mechanism with clear responsibilities and rights, strengthening business ethics management and maintaining sustainable corporate operations and development.	ESG Management
		Board Governance
	Proactively engage in external cooperation by participating in the standard construction of cybersecurity, data security, and AI security , and cooperating with ecological partners to facilitate the ecological construction of the industries.	Business Ethics
		Security Guarantee
		Technological Innovation

Independent Statement of Assurance



Bureau Veritas Certification

温室气体核查声明书

授予

百度集团股份有限公司

核查地址：北京市海淀区上地十街 10 号百度大厦(总部)

26 处办公场所，6 处自营数据中心及 1 处车辆运营场所（详见核查报告）

组织边界：基于运营控制权，总部及 26 处办公场所，6 处自营数据中心及 1 处车辆运营场所（见核查报告附件）

报告边界：百度集团股份有限公司办公、数据中心区域，车辆运营场所

限制性叙述：排除其他非重要间接温室气体排放，排除中华人民共和国境外的温室气体排放

保证等级：合理保证等级

必维认证（北京）有限公司

证明上述单位依据下列国际标准执行组织温室气体盘查工作，查证数据为合理测量和计算，其它详细声明如附件所述。

ISO 14064-1:2018

经核查 2022 年 01 月 01 日到 2022 年 12 月 31 日期间

查证温室气体直接和能源间接排放数值为：822263.1 吨 CO₂e

查证温室气体间接排放源数值（租赁 IDC，员工通勤）为：1299528.5 吨 CO₂e

基准年：2020

签发日期：2023 年 02 月 17 日

声明书编号：CN100213A

认证机构地址：中国北京市东城区东长安街 1 号东方广场西一办公楼 9 层 902 室，邮编：100738
当地办公室地址：中国北京市东城区东长安街 1 号东方广场西一办公楼 9 层 902 室，邮编：100738

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Reader Feedback Form

Dear readers,

Thank you for reading our 2022 Environmental, Social and Governance Report. We sincerely welcome your valuable comments and suggestions on this report and our work. You can give your feedback through the mail or email. Thank you!

1. As a stakeholder of Baidu, what is your relationship to Baidu ?

☐ Shareholder ☐ Employee ☐ Supplier or Business Partner ☐ User ☐ Government ☐ Community
☐ Financial Institution ☐ Academic Institution ☐ Others (Please specify) _____

2. What is your overall comment on this Report ?

☐ Excellent ☐ Good ☐ Average ☐ Below average

3. What do you think about the clarity, accuracy and completeness of the information disclosed in this Report ?

☐ Excellent ☐ Good ☐ Average ☐ Below average

4. What do you think about the comprehensiveness of Baidu's economic responsibilities reflected in this Report ?

☐ Excellent ☐ Good ☐ Average ☐ Below average

5. What do you think about the comprehensiveness of Baidu's environmental responsibilities reflected in this Report ?

☐ Excellent ☐ Good ☐ Average ☐ Below average

6. What do you think about the comprehensiveness of Baidu's social responsibilities reflected in this Report ?

☐ Excellent ☐ Good ☐ Average ☐ Below average

7. What do you think about the design and layout of this Report ?

☐ Excellent ☐ Good ☐ Average ☐ Below average

8. Which part of this Report do you think needs improvement ?

☐ Enhancing Corporate Governance ☐ Building Trust ☐ Nurturing Talent
☐ Promoting Green Ideas ☐ Improving Services ☐ Contributing to Society

9. Content that you wish to know more about beyond this Report ?

10.Your suggestions regarding the compilation of our ESG Report ?



Bureau Veritas Certification

Greenhouse Gases Verification Statement

is awarded to

Baidu, Inc.

Verified address: Baidu Campus,NO.10 Shangdi 10th Street,Haidian District,Beijing,The People's Republic of China 100085 (HQ), Including 26 Office locations,6 Baidu Opereted Digital Centers and 1 Vehicle Operation Site

Organizational boundaries: Based On Complete Financial and operational Control

Reporting boundaries: HQ, 26 Office location and 6 Baidu Opereted Digital Centers and 1 Vehicle Operation Site,Reserch and Development, Digital Center Activities

Limitation conclusion: Other non-significant indirect emission excluded, Emission from locaitons out of P. R. China excluded.

Level of assurance: Reasonable

Bureau Veritas Certification (Beijing) Co., Ltd

Certifies that above organization had conducted Greenhouse Gas inventory in accordance with the requirements of the standard detailed below, and verification data are reasonable measurement and calculation. Other details are described in the appendix.

ISO 14064-1:2018

Verified from 01 Jan., 2022 to 31 Dec., 2022

Verified Direct and Energy Indirect Greenhouse Gas Emission: 822263.1 ton CO₂e

Verified Other Significant Indirect Greenhouse Gas Emission (Scope3): 1299528.5 ton CO₂e

Base Year: 2022

Issue date: 17-02-2023

Statement No. : CN100213A

Certification body address: Room 02, 9 / F, West Office Building 1, Oriental Economic and Trade City, Oriental Plaza, No.1 East Chang'an Street, Dongcheng District, Beijing, China. 100738
Local office address: Room 02, 9 / F, West Office Building 1, Oriental Economic and Trade City, Oriental Plaza, No.1 East Chang'an Street, Dongcheng District, Beijing, China. 100738

Further clarifications regarding the verification scope of this statement may be obtained by consulting the organization.
To check this statement validity please call: +86 10 59683888