Alibaba Group
阿里巴巴集团

2021

阿里巴巴碳中和行动报告

ALIBABA GROUP CARBON NEUTRALITY ACTION REPORT

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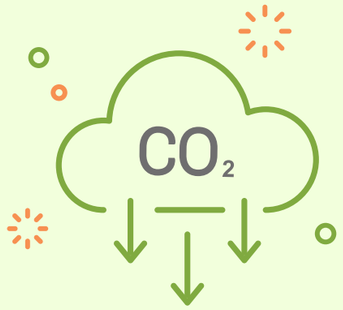


Letter from Our Chairman and CEO

Responsible Technology, Sustainable Future

Climate change is becoming a high-profile topic around the world. It is a Pandora's box that has unleashed complex consequences that are difficult for humanity to assess accurately. The many extreme weather events and catastrophes over this past year were warnings of the serious situation we face and a stern reminder that we need to act faster.

In our first "Alibaba Group Carbon Neutrality Action Report," we have laid out Alibaba's carbon reduction strategy and phased goals. In alignment with China's landmark strategic commitment for carbon neutrality, we hope to realize carbon neutrality for Alibaba's own operations before 2030. In collaboration with our customers, partners and consumers up and down our ecosystem's value chain, we aim to reduce carbon intensity by half, using 2020 levels as a baseline. Moreover, as an infrastructure provider for a green economy, Alibaba Cloud will take the lead and aim to achieve Scope 3 carbon neutrality by 2030.

We are making a solemn commitment in announcing these goals. It will be challenging, but we believe the future of sustainable development will be a low-carbon circular economy driven by new technologies and new types of energy. As a responsible technology company, these are demands that Alibaba must make of itself. Carbon reduction needs long-term persistence and efforts, and the next decade will be decisive. During the formation of our goals, Alibaba initiated a comprehensive analysis of the greenhouse gases generated by our own operations for the first time. Due to the diversity and variance of our business, the analysis has been unusually complex. We will pursue the most appropriate and effective approach for reducing carbon emissions as we embark on our ten-year journey towards carbon neutrality.

We know that if we want to bring about real change, we must act in concert with partners. As a digital technology company, Alibaba believes leveraging digitalization to reduce our environmental impact will be the collective choice for Alibaba and its ecosystem partners. As a unique operator of a platform business, we plan to take on more responsibilities and drive more transformation within the Alibaba digital ecosystem. Today, many ecosystem participants are amassed across our digital commerce, smart logistics and cloud computing platforms. These ecosystem participants are not just business partners, but also allies in reducing our carbon footprint. Therefore, in our strategy for reducing carbon emissions, we are introducing a brand-new dimension in addition to the traditional industry framework of Scope 1, 2 and 3. For this brand-new dimension, which we have named Scope 3+, we hope to mobilize ecosystem partners and the power of consumers to ultimately drive a cumulative reduction of 1.5 gigatons in carbon emissions by 2035.

Scope 3+ is an important new goal in the Alibaba carbon neutrality strategy. We are delighted to see that many of Alibaba's business partners have already established their own ambitious goals to reduce their environmental impact, while many consumers are increasingly eco-conscious in their lifestyle and consumption. It inspires confidence for our Scope 3+ goal of reducing 1.5 gigatons in carbon emissions by 2035. We have already started to conduct a lot of exploration and experimentation within our ecosystem. For example, we have incentivized consumers to choose more eco-friendly products on our e-commerce platforms and exchange pre-owned goods through our circular economy platform. Through Cainiao's smart logistics platform, we have encouraged more extensive use of recycled packaging and materials recycling. We have also encouraged and promoted eco-friendly transportation on Amap. We are facilitating the establishment of more digital workplaces through our cloud computing infrastructure and DingTalk's smart collaborative working platform. There is much room for us to innovate and create a new technology-driven low-carbon circular economy together with our ecosystem partners.

The road ahead will be long and arduous, but we can reach our destination if we persist. On the 20th anniversary of Alibaba Group, we made a significant update to our vision statement, which is "to be a good company that will last for 102 years."Environmental protection, social responsibility and organizational governance are all part of the "good" we hope to achieve. We want this "good" to align and resonate with the interest of our community and the wider world. Together with allies and through responsible technology, we hope to contribute positive changes to the world and make the future more sustainable, greener and better!

Daniel Zhang
Chairman and Chief Executive Officer
Alibaba Group
December 2021

01
Tackling Climate Challenges for Sustainable Development

Climate Change is the Greatest Challenge of Our Time

The Industrial Revolution has brought economic prosperity unparalleled in human history. By 2020, global per capita GDP had reached US$11,000, a 10-fold increase from before industrialization[1]. However, over the past 200 years, human demand for fossil energy and other non-renewable resources expanded exponentially. Natural resources are now consumed at a rate nearly twice the Earth's rate of regeneration. Large quantities of greenhouse gas (GHG) emissions from anthropogenic activities have become the main cause of global climate change, resulting in more frequent and intensive natural disasters, ecological degradation, and pollution in the air, soil, and water. It is posing a serious threat to the long-term survival of human beings and natural ecosystems.

The Sixth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) further warns of the severity and urgency of the climate crisis. If the increasing trend of GHG emissions cannot soon be reversed, its catastrophic environmental impacts will be unavoidable, thus fundamentally compromising future economic development. Countries reached further agreement during the 26th Conference of the Parties to the United Nations Convention on Climate Change (COP26) that it is paramount to achieving carbon neutrality by the middle of this century in order to reaching the 1.5°C aspiration of the Paris Agreement. It entails tasks that must be completed to arrest and ultimately reverse climate change. To shoulder its responsibility, the Chinese government also made the pledge in September 2020 that the nation will aim to reach peak carbon dioxide emissions by 2030 and strive to achieve carbon neutrality by 2060.

Digitalization is Key for Building a Low-carbon Circular Economy

With a climate crisis already underway, an economic transition must now take place quickly. To completely decouple economic development from the world's heavy reliance on use of non-renewable resources and anthropogenic GHG emissions, the world's economy will need to move from a linear model of "take, make, dispose" to a low-carbon circular economic model of "refuse, reduce, reuse, refurbish, and recycle." This is a must if we are to achieve effective carbon neutrality while maintaining a healthy environment and a just and equitable society where the quality of everyone's life improves along with the economic growth that makes this possible. This is especially important for China and other emerging and developing economies.

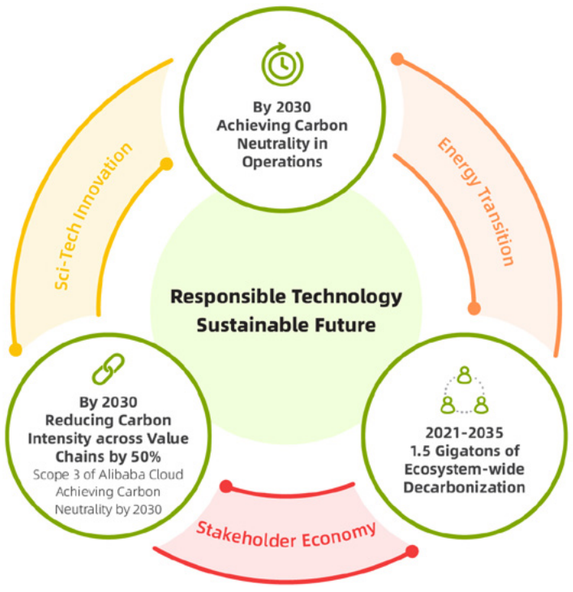
[1] Maddison Project Database, version 2020. Bolt, Jutta and Jan Luiten van Zanden (2020), "Maddison style estimates of the evolution of the world economy. A new 2020 update."

Achieving a robust transition to a low-carbon circular economy must rely on wide-spread adoption of three pillars for win-win economic growth and environmental improvements:

- **Energy transition** from reliance on fossil fuels to universal uses of clean energy, especially renewables.
- **Science and technology innovations**, especially breakthroughs in low-, zero- and negative-carbon technologies, and related physical, material, and other basic sciences.
- **Stakeholder economy**, entailing a collaborative governance model in which regulations and market mechanisms work hand in glove and where governments at every level work with enterprises, small, medium and large and where consumers, and other stakeholders are all motivated to transition to a new economic system with renewed social contracts and lifestyles.

We are convinced that digitalization will provide a great opportunity for enabling the transformation to a sustainable economy - a "win-win" economy in which every progress in the economy is also an improvement to environment and vice versa. This is possible because increasing penetration of digitalization will greatly enhance the speed and efficiency in which the twin objectives are realized, enabling heretofore unattainable emission reduction. Secondly, widely adopted digital technologies are already reliable and scalable, making it much easier to measure and manage mankind's ecological footprint. Thirdly, increasing the penetration of the digital economy will integrate digital and green technologies through bottom-up, decentralized market mechanisms, aligning each individual's self-interest to be in the broader public interest of environmentally sustainable and economically inclusive development.

This means that a carbon neutral future must be grounded in a low-carbon, circular-economic development model that best captures the benefits of digitalization.



Responsible Technology, Sustainable Future:
Alibaba's Commitment to Carbon Neutrality

Alibaba Group Holding Limited and its subsidiaries (hereinafter referred to as 'Alibaba') was first founded with a social mission to use technology to level the playing field and to empower small and medium-sized enterprises. Our mission, which has remained unchanged for more than 20 years, is **to make it easy to do business everywhere**. We promote inclusive economic growth for everyone wherever they live. Today, this mission has been given a new level of significance. We are proudly taking social responsibilities for a platform company by trying to tackle society's biggest challenges. Alibaba aims to make every attainable effort to coordinate digital economic resources to promote sustainable as well as inclusive economic growth. Alibaba's value proposition is not only to enhance consumers' quality of life, but also to help firms – especially small and medium enterprises – to achieve sustained development while helping to reduce global carbon emissions.

On this premise, Alibaba has committed to join the Science-Based Targets initiative (SBTi) to help limit the global temperature increase to 1.5°C and is setting the following near-to-midterm targets to carbon neutrality:

- **Decarbonizing Alibaba (Scopes 1 and 2):** By 2030, Alibaba will achieve carbon neutrality in its own operations.
- **Greening the value chains (Scope 3):** By 2030, Alibaba will collaborate with our upstream and downstream value chain partners to cut emission intensity[2] by 50% in regard to the base year of 2020. Alibaba Cloud provides the key digital infrastructure and will achieve Scope 3 carbon neutrality during the same period.
- **Enabling low-carbon circular digital ecosystem (Scope 3+):** Beyond our own operations and direct value chains, we pledge to leverage our digital platforms to encourage even broader participation by stakeholders affected by our efforts. By 2035, we will facilitate 1.5 gigatons of GHG emission reduction over 15 years in Alibaba digital ecosystem (see section "1.5 Gigatons for 1.5°C").

[2] Here emissions intensity is measured as total GHG emissions divided by annual revenue.

Tackling Climate Challenges for Sustainable Development

While facing the challenges ahead, we are also motivated by setting these targets. As a digital platform operator, Alibaba intends to accomplish its internal emission reduction goals alongside millions of other companies by technological and business model innovations. We strive to make it progressively convenient to conduct commerce domestically and internationally in a business environment in transition to a low-carbon circular economy. To these ends, we are committed to make significant and substantive improvements in our governance structure, reporting systems, and financial resources utilization:

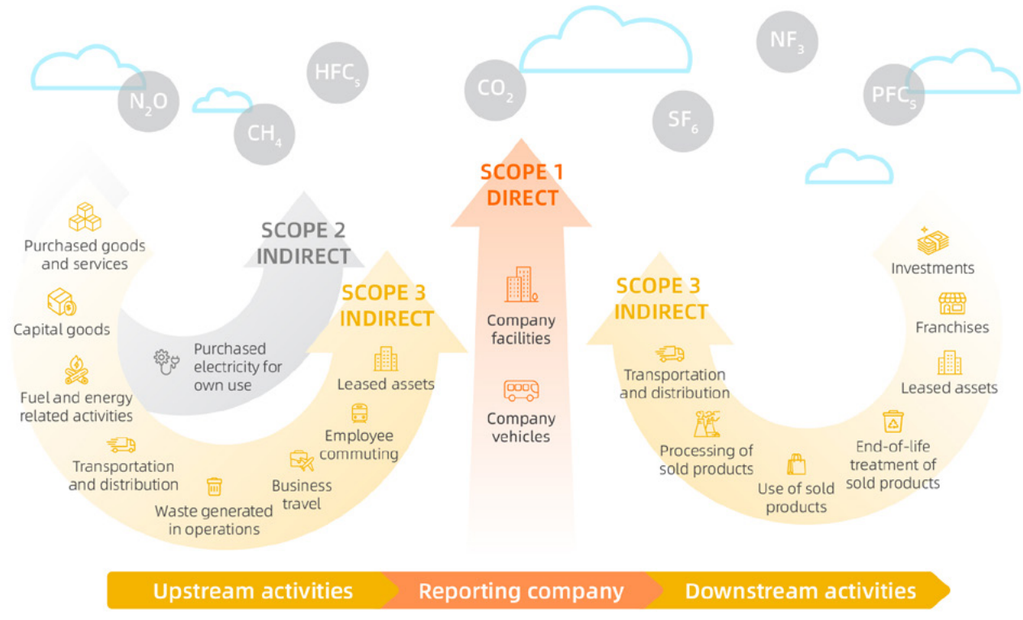
- **Prioritizing carbon neutrality among Alibaba's environmental, social, and governance (ESG) goals;** meanwhile, establishing a three-tier governance structure from the Group's board of directors down to business units to ensure robust institutional support.

- **Continue to improve information transparency and data disclosure as well as reporting mechanism.** Starting in 2022, we will disclose concrete and specific annual progress toward meeting societal goals including carbon emissions reductions and inclusive, equitable economic progress. All reports will adhere to the most reputable metrics laid out in domestic and international standards and will be verified by accredited auditors.

- **Demonstrating our commitment to low-carbon innovation** by investing in key technological innovations, meeting urgent needs in service of society's carbon neutral, economically inclusive targets.

Definition of Corporate GHG Emissions Scopes 1, 2, and 3

The Greenhouse Gas Protocol: Corporate Accounting and Reporting Standard by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) classifies a company's GHG emissions into three 'scopes'. Scope 1 emissions refer to direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy for own consumption. Scope 3 emissions include all other indirect emissions (not included in scope 2) that occur in the company's value chain, including both upstream and downstream emissions.



* Adapted from Greenhouse Gas Protocol: Corporate Accounting and Reporting Standard

Seven Principles for Achieving Carbon Neutrality

Realizing the promise of carbon neutrality is a long-term journey full of opportunities as well as uncertainty. We intend to uphold the following seven principles:

Responsibility

To the greatest extent possible, we will assume the environmental and social responsibilities that society expects us to shoulder. We will also adhere to this principle of responsibility as we pursue technological and business innovations.

Science

We will base our carbon neutrality targets and action plans on state-of-the-art scientific evidence and methods with flexibility to revising our goals and plans in alignment with the latest scientific findings. Meanwhile, we will facilitate the advancement of scientific and technological progress related to carbon neutrality.

Transparency

We will strictly adhere to international standards of accuracy and transparency on the related information disclosure, under the supervision of authoritative institutions both domestic and international.

Trust

We believe that trust is the cornerstone of multi-stakeholder collaboration. We will strive to foster trust among all our stakeholders from within our digital ecosystems as wells as in the broad society.

Open Community

We will work with willing partners within every sector of society to build an open community, promoting and supporting actions and innovations that propel sustainable development.

Participation

We will fully encourage all Alibaba employees' participation in building a corporate culture focusing on sustainability and on low-carbon and circular economic innovations.

Long-termism

The road to carbon neutrality is long and winding. We will persevere in maintaining a long-term perspective and making necessary adjustments along the way. Meanwhile, we are committed to meeting short-term goals with vigor, no matter how arduous the tasks may prove to be.

While Alibaba has made some progress on decarbonization, we are still at the start of our journey (see the panel below for selected recent actions). We aim to apply these principles in making our carbon neutrality commitments and developing our action plan, which we will elaborate in the rest of this report. More importantly they will guide us to better integrate the 3 pillars for the coming transition to the low-carbon circular economy of the future – energy transition, science and technology innovations and stakeholder economy.

Highlights of Alibaba's Decarbonization Actions

Science and Technology

1.09
PUE

Alibaba's Zhejiang Renhe Cloud Data Center, which opened in September 2020, deploys the world's largest liquid-cooling cluster, and with the lowest PUE of 1.09.

Panjiu-M Server and Yitian710
The most powerful ARM server and chip

Adopting the most advanced 5nm process, its performance exceeds the industry performance benchmark by 20% with a 50 % increase in the energy efficiency ratio.

Electronic Label

CaiNiao pioneered in applying digital parcel management tool based on electronic labels to replace traditional paper labels. Applied to over 100 billion parcel, it has helped the whole industry save 400 billion sheets of paper.

15%
Saving of packaging material

Using big data algorithm model to help optimize the sizes of boxes has led to an average of 15% reduction in the use of packaging materials.

Stakeholder Economy

The world's largest consumer market for second-hand goods

With 300 million cumulative users, of which over 20 million users communicating on Idlefish per day and over 1 million items sold per day.

40%
Original box shipping rate

Goods with the original packaging are labeled and shipped, effectively reducing the use of packaging boxes, bags and tape.

87,000 Stations for box recycling

During the 11.11 shopping festival in 2021, 4.8 million consumers participated in box recycling in 87,000 Cainiao stations.

24,500 tons
Carbon trading from voluntary emission reduction activities

In 2021, Amap facilitated the trade of 24,500 $MtCO_2e$ of carbon reduction credits on Green Travel MaaS platform.

Energy

Green power purchase and usage
First place

In 2020, Alibaba ranks first in green power purchase and usage in China's Internet industry.

Certifications & Awards

Low carbon
Data center

Alibaba Cloud's Green Data Center was selected as a exemplary low-carbon model by the Ministry of Ecology and Environment and is the only data center among the ten winning enterprises.

Green Innovation Recognition of Excellence

Alibaba Cloud's energy-efficient data centers were awarded a Green Innovation Recognition of Excellence from the 2021 Paulson Prize for Sustainability.

LEED Certification

By the end of 2020, 10 campuses were built and delivered with 677,034 square meters of LEED certification.

02
How Alibaba will Achieve Carbon Neutrality

Alibaba's Understanding of Carbon Neutrality

The Chinese government has set a phased goal to achieve carbon neutrality by continuously reducing energy consumption per unit of GDP. This means that Alibaba must also do its part moving towards a low-carbon and circular future, especially in the context of the company's continuous business growth and for the sake of China's continued inclusive economic development. We explore a variety of options to improve energy efficiency, energy use per unit of production, ultimately cutting overall emissions, particularly through our core strengths – digital technology and platform innovation.

Most Alibaba's businesses are in emerging economies, where urbanization and digitalization are accelerating, but the energy mix, national resource endowments, and infrastructure readiness have not been conducive to decarbonization efforts. In those economies, emissions reduction strategies often take into account existing and timely tradeoffs with economic development imperatives, infrastructure constraints, resource conditions, and consumer demands. As the largest emerging economy reliant on manufacturing, China is expected to take a pathway that balances decarbonization with economic development. The challenge going forward will be to convert this near-term adverse trade off into long-term opportunities for economic advances that simultaneously improve environmental sustainability. What's more, China's carbon neutrality strategy and experience will have global significance, particularly illuminating for the emerging economies.

As a leading digital innovator, Alibaba intends to apply carbon neutral best practices to our worldwide business operations, especially in the emerging markets where fossil fuel still dominates the energy structure. While we may experience a period of temporary increase in absolute emissions as our businesses grow, effective digitalization measures can improve efficiency and reduce carbon emissions per unit of production. As China's economy grows, we will work to ensure that the reductions per unit of production ultimately lead to aggregate reductions for Alibaba and to help China to ensure that the same is true for the broader economy. Accelerating the digital transformation will be at the core of Alibaba's carbon neutrality strategy.

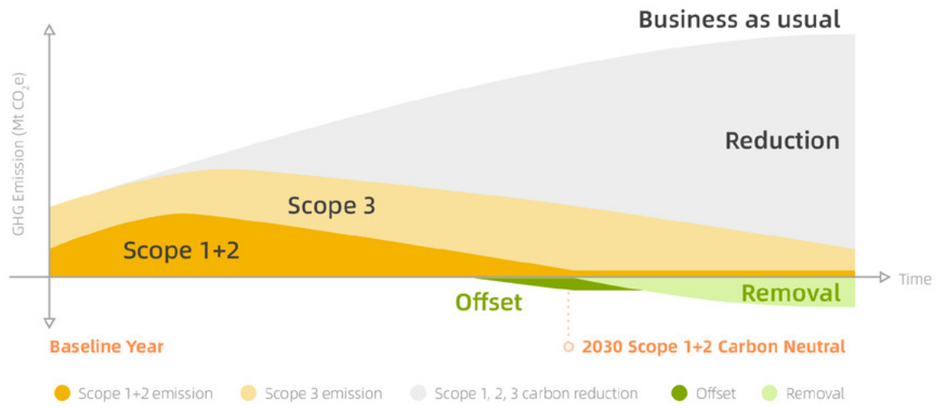
We recognize that the future path of emissions reduction will also be determined by technological development in other key areas. For instance, a major consensus was achieved in the COP26 on accelerating the decarbonization of the global transportation system, but it remains a daunting challenge to fully decarbonize the aviation industry before 2050. Nevertheless we will keep track of major breakthroughs in science and technology as well as the ongoing continuous, arduous improvements even as we strategically choose to participate in and adopt all the innovations, both large and small, that are applicable to our business operations.

How Alibaba will Achieve Carbon Neutrality

Alibaba's Carbon Neutrality Strategies and Roadmap

Alibaba's carbon neutrality strategy will be achieved using a combination of decarbonization measures, including energy efficiency enhancement, clean energy replacement, and carbon offset and removal. We will adhere to the following general principles: direct carbon reduction takes precedence over carbon removal, and carbon removal takes precedence over offsets. We formulate our strategy to be in line with international standards for substantively reducing the concentration of greenhouse gases in the atmosphere consistent with the 1.5°C target in the Paris Agreement[3].

A Roadmap to Carbon Neutrality



*The pathway in the chart is indicative.

In the process of our transition, there inevitably will be an absolute rise in power consumption along with economic and business development. Therefore, in the near term, we will leverage digitalization and electrification to reduce carbon emissions and increase the use of clean energy. We will also continue to explore other options, such as carbon removal through negative emissions technology. It is expected that these approaches will be applied at scale after 2030 or later.

Alibaba will adopt a systematic approach to plan and manage decarbonization initiatives to achieve low-carbon and eventually zero-carbon development. At present, we mainly follow the "ISO14064-1:2018 Specification with Guidance at the Organizational Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals," and we refer to the "GHG Protocol: Corporate Accounting and Reporting Standard" and to the "GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard" published by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) to stipulate the boundaries of Scopes 1, 2, and 3 greenhouse gas emissions and formulate Alibaba's initial decarbonization roadmap. However, not all carbon emissions that we can influence as a platform company are covered by the current GHG emission scopes, and standards for measuring these potential carbon reductions have not been established. This is why we put forward the concept of "Scope 3+" based on the potential of digital platforms to influence and advocate for low carbon products, services and behavior among a wider group of stakeholders in our ecosystem (see next section). We will elaborate in details the boundaries of each scope and the emissions therein to ensure transparency and clarity. Our result will be quantified, audited, and certified by authorized organizations.

[3] See more details on Science-Based Targets initiative's guidance on what the latest climate science deems necessary to meet the goals of the Paris Agreement - limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.

Our Understanding of Two Types of Carbon Credits: Offset vs Removal

According to the Science-Based Carbon Targets Initiative (SBTi), there are two types of carbon credits: carbon offset and carbon removal. Offset (or compensation) is carbon credit resulting from actions taken to help reduce or avoid emissions outside the organization's value chain such as protecting forests from deforestation and replacing fossil fuels with renewable energy. Removal is credit resulting from direct removal of greenhouse gases from the atmosphere, which may include planting trees or technological approaches such as CCUS (Carbon Capture, Utilization and Storage) and DAC (Direct air capture).

Carbon offsets by enterprises can provide an important source of funds for organizations to reduce emissions and protect the environment. However, if enterprises take actions to remove carbon emissions, the current cost of which the is higher than that of the carbon offset, the offset can be misused as when non-transparent or even fraudulent emissions reductions are created with double counting. Therefore, the efforts invested in the two types of credits need be balanced, and the whole society will achieve carbon neutrality faster if enterprises actively participate in carbon removal while temporarily relying on carbon offsets purchased from others.

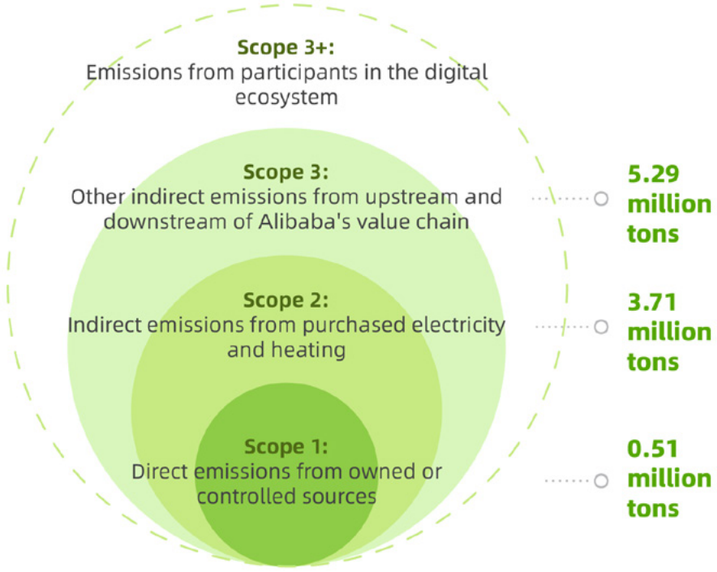
Alibaba’s Greenhouse Gas Emissions

In 2020, the total greenhouse gas emissions accounted in Scope 1-3 generated by Alibaba amounted to 9.51 million metric tons of carbon dioxide equivalent ($MtCO_2e$). Alibaba's Scope 1 direct greenhouse gas emissions from sources owned or controlled by Alibaba entities were 0.51 million MtD. This includes stationary combustion, mobile combustion, chemical or production processes, fugitive emissions, logistics services for self-owned fuel vehicles, and fuel emissions from offices and stores. Our Scope 2 greenhouse gas emissions from purchased power for operations were 3.71 million $MtCO_2e$. The majority of power demand was from cloud-computing data centers, retail stores, and office buildings.

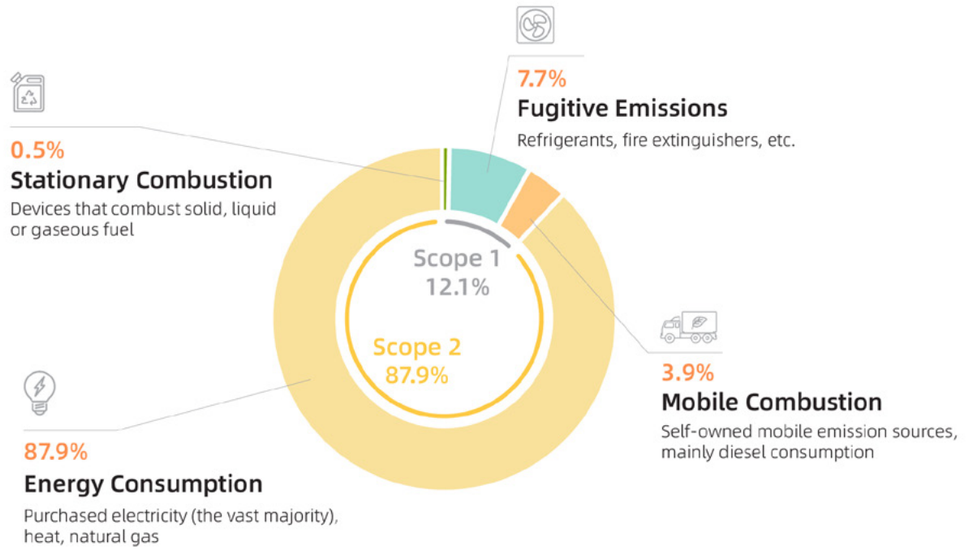
Alibaba's Scope 3 indirect greenhouse gas emissions generated from our upstream and downstream value chain were approximately 5.29 million $MtCO_2e$. This was mainly resulted from fuel consumption in outsourced transportation and distribution services, purchased electricity for leased data centers, the uses of packaging materials and consumables, infrastructure operations (such as leased warehouses and parks), and employee travel and commuting.

This is Alibaba’s first attempt to baseline its greenhouse gas emissions. We have pursued a scientifically rigorous process, but also fully realize that this is a work in progress, leaving much work to be done, given the complexity of these measurements across our diverse business practices. We endeavor to gain more information on many aspects of our upstream and downstream value chain, on emissions from the use and the disposal of products, and on other sources not yet effectively measured. These efforts will continue to improve our methodology and increase the boundaries to all activities relevant to greenhouse gases in Scope 3. The accounting was completed by China Environmental United Certification Center, and the results of the accounting were audited by Bureau Veritas.

Alibaba’s GHG Emissions, 2020



Achieving a Green Alibaba: Our Strategy for Reducing Greenhouse Gas Emissions



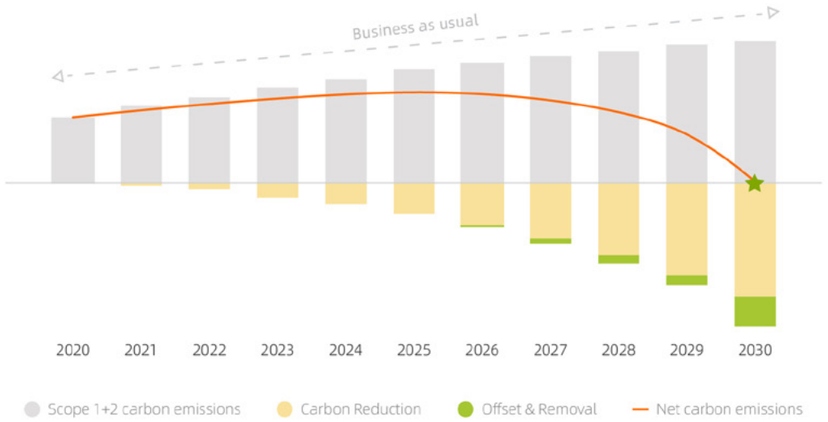
Of Alibaba’s total emissions accounted, 12.1% is attributed to direct emissions from Alibaba’s controlled assets (Scope 1). Part of these Scope 1 emissions comes from fuel emissions from self-owned vehicles for both short-distance and long-distance logistics services. The remaining is fugitive emissions from refrigerants and extinguishers. In addition, there are some carbon emissions currently unavoidable, such as emissions from the combustion of low-, but non-zero carbon emissions from natural gas and other energy sources in offices and retail stores.

Our Scope 2 emissions, 87.9% of the total, comes from purchased electricity. This is also the main source of carbon emissions from Alibaba’s own operations (Scopes 1+2) in 2020. It was mainly used for our cloud computing, stores, warehouses, and office operations.

To achieve Scope 1 and 2 carbon neutrality, we will focus on four emission reduction strategies: electrification and digitalization, energy efficiency improvement, renewable energy development, and carbon offset and removal. We will also adhere to the 5R circular economy principle of refuse, reduce, reuse, refurbish, and recycle. In addition, as a technology company operating multiple leading platforms, the carbon emissions generated directly by Alibaba's own operations account for only a small part of the total emissions that we can influence.

Alibaba's potential to drive carbon reduction is far greater than our own Scope 1-3 emissions, especially in driving millions of merchants and over 1 billion consumers on our digital platform's ecosystem. This is the rationale for proposing the concept of "Scope 3+." In addition to our own operations, we can also empower businesses and consumers on our platforms to decarbonize. Next section covers this in depth. The rest of this section will focus on the efforts and plans of our directly operated retail businesses, including Freshippo, Sun Art Retail and Intime Department Stores.

Scope 1&2 Carbon Neutrality Pathway



*The pathway in the chart is indicative.

Electrification and Digitalization

Fuel emissions presently account for 32.3% of scope 1 emissions. These are mainly from the logistics vehicles of Freshippo, Lazada, and Sun Art Retail. For these fleets, we plan to transition all short-haul vehicles to electric vehicles by 2030. For the long-distance fleet we plan to introduce electric or hydrogen-powered heavy-duty vehicles at scale as the relevant technology becomes more mature. For Lazada, the evolution of the fleet will depend heavily on the development of electric vehicle infrastructure across its markets in Southeast Asia. Starting in Indonesia in March 2021, Lazada logistics has established its first collaborative electric motorcycle fleet with one of our third-party logistics providers, in efforts to reduce last mile delivery carbon footprint in sending packages to Greater Jakarta customers. Electric delivery fleet provides quality logistics solutions for businesses, especially micro, small and medium enterprises. Alibaba will proactively explore innovations and investments that can advance these and other initiatives and programs.

In parallel, we are exploring the development of smart transportation systems with autonomous vehicles. The combination of artificial intelligence (AI) and electrification can improve transportation efficiency, thereby reducing attendant carbon emissions. In 2020, the Autonomous Driving Laboratory of Alibaba's DAMO Academy developed an electric autonomous vehicle for logistics dubbed "Xiaomanlv" with a cruising range of over 100 kilometers. By November 2021, Alibaba invested to deploy 350 autonomous vehicles into campuses and communities. We are also developing an autonomous truck, "Damanlv," which targets urban distribution scenarios including sending goods from distribution stations to logistics endpoints. The trucks are undergoing initial road testing, with planned urban and logistic center testing in future. These pipeline innovations advancing the use of AI in logistics and transportation equipment can be expected to make substantial contributions to the energy efficiency of the transportation system.

Efficiency Improvement and Emissions Reduction

Realizing the goal of carbon neutrality requires us to focus on improving energy efficiency and reducing GHG emissions, including not only the directly controlled emissions in Scope 1, but also emissions from offline retail, Alibaba Cloud (as detailed in the introduction in next section) and campuses around the world. Offline retail emissions are mainly caused by the aging of refrigeration equipment in some stores, and we are upgrading this equipment.

In China, the process of urbanization is continuing as the retail industry continues to grow. Alibaba's three businesses with physical stores are Freshippo, Sun Art Retail, and Intime. Heating, lighting and cooling account for the majority of their carbon footprint, so the primary carbon reduction methods will be the adoption of more energy efficient technologies and the deployment of renewable energy. We have already been working to decrease our units' environmental footprints.

In Sun Art Retail stores, we have carried out projects including LED lighting, automated high efficiency central air-conditioning, and range hood vent automation. These and other projects have greatly increased energy efficiency. For example, the range hood vent upgrades save more than 20 million kWh of electricity every year.

Intime has also improved energy efficiency in its shopping malls. Among the 15 stores to be renovated, three have been completed and have increased the energy-efficiency by 26% in just half a year. The remaining 12 stores under renovation will save an estimate 8.5 million kWh annually.

Freshippo has been focusing on the optimization of the cold chain system for producing, storing and transporting perishable goods, its largest use of energy. The optimization project can reduce the number of system starts, and at the same time improve operational stability and efficiency, with an estimated 5.4 million kwh saved annually after completion.

In our office parks, we are implementing environment friendly practices based on the 5R principles of the circular economy. We aim to provide employees with a green, low-carbon, healthy, and pleasant working environment, while promoting innovations in green technology. Meanwhile, we aim to raise awareness and foster a low-carbon corporate culture through employee engagement, creating feedback channels that will substantively influence business actions.

We are committed to continually improving the sustainable design of our physical plant. By the end of 2020, more than 677,034 square meters of self-built offices have been awarded LEED certification. In the future, all self-built Alibaba campus will achieve a minimum of LEED Gold Level certification and two-star China Green Building Environmental Label. Digital technology has been incorporated into the energy-saving management of the campus. Through environmental sensors and smart IoT equipment, energy use in our offices is actively monitored. Energy intensive equipment such as projection screens, lights, and air conditioners are automatically controlled in an adaptive way with the surroundings. In addition, real time energy consumption can be continuously displayed and managed in Alibaba's smart center. With these measures in place, energy consumption per capita decreased by more than 10% in the last two years.

In addition to carbon emissions, we have also expended effort to reduce our water and plastic footprint. We have adopted extensive use of water-saving infrastructures and sanitary appliances. We have invested in the construction of water purification systems to achieve automatic conversion from tap water to direct drinking water to reduce the use of plastic water bottles. We use drinking fountains and water dispensers that do not provide plastic cups. Similarly, besides installing normal recycling bins for plastics, we have adopted a plastic surcharge that doubles the cost of reliance on disposable lunch boxes in canteens, further reducing plastic waste.

These are small but important measures, as we cannot achieve carbon neutrality and sustainability transition without the willing participation of our employees. We want to be consistent in running our own offices in a sustainable business ecosystem. To this end, we will promote our best practices across our more than 700 offices and 250,000 employees in 28 countries around the world.

Renewable Energy

As the level of electrification increases, more carbon emissions are being transferred from end-use to the generation of the requisite power. Increasing the proportion of renewable energy in electricity consumption is therefore our most important means to achieve carbon neutrality in Scopes 1 and 2 emissions. We are taking various actions to progressively increase the ratio of renewables in our power supply.

Firstly, we have vigorously deployed distributed solar power on eligible sites. Since 2017, Cainiao has deployed rooftop photovoltaic power (PV) in smart logistics parks in Shanghai, Guangzhou, Hangzhou, Wuhan, and Dongguan. In 2020, the annual power generation capacity of 6 logistics parks with rooftop PV exceeded 18 million kWh, equivalent to reducing 12,000 tons of carbon emissions. We plan to complete the installation of rooftop PV in all Cainiao logistics parks that have required natural conditions by 2030. For Sun Art Retail, we have already deployed solar power on the rooftops and parking lots of 16 stores where conditions are suitable. More than 11 million kWh were generated in 2020.

Secondly, we are leading in purchasing renewable energy, ranking first in China's internet industry in terms of green power purchases from 2018 to 2020. In the first 10 months of 2021, we have bought more than 250 million kWh of renewable energy. Alibaba Zhangbei Data Center was selected as the first "carbon inclusiveness" pilot project in China's data centers. In September 2021, the Zhangbei data center cluster, with the support of the National Development and Reform Commission, the State Grid Corporation of China and other organizations, purchased a total of 100 million kWh of solar power through the North Hebei Power Exchange Center for power supply in the fourth quarter of 2021. The data center obtained the "Green Power Consumption Certificate" issued by the Beijing Electric Power Exchange Center, the first data center in China for the use of traceable green power on a large scale.

In November 2020, working with the Zhejiang Power Exchange Center, Intime purchased 30 million kWh of green power from Xiangshan Datang Renewable Power Co., Ltd. This was the first green power transaction in the department store industry in Zhejiang Province.

Thirdly, we will also actively engage in renewable energy investment in order to secure more and cleaner electricity in the long term. Outside of China, we also are aggressively participating in renewable energy transactions. For example, in Southeast Asia we plan to switch to renewable energy to cover all operational needs for power by 2030.

Carbon Offset and Removal

A reliable carbon neutrality strategy requires not only emissions reduction as a primary tool but also hedging initiatives. We expect to use offsets as a last step to decarbonize residual amount of emissions through the purchase of high-quality carbon emissions reduction credits. For instance, in Southeast Asia where electrification of major infrastructure and renewable energy development is still in early phases of market maturity, we plan to work with blockchain carbon credit providers to purchase high quality carbon credits that invest into Verra carbon standards reforestation projects as supplement to our regional carbon neutrality strategy, especially for achieving Alibaba's Scope 1 and 2 neutrality goal in the coming decade.

Natural carbon sinks not only sequester carbon, but also provide significant ecosystem services to the society, including the protection of biodiversity and public health. Therefore, while purchasing carbon sinks, we also plan to carry out a series of active carbon removal projects based on natural climate solutions (NCS), with a particular focus on forests, wetlands and agricultural carbon sinks. These efforts will be linked with Alibaba's public welfare and rural revitalization efforts.

Technology-based carbon removal is the key long-term solution for achieving neutrality. We plan to provide financial support and explore relevant technologies, such as the industrialization of Direct Air Capture and Storage technology in the areas where renewable energy is generated and consumed. When these projects are mature, we aim to be among the first to apply them actively to start offsetting any remaining emissions.

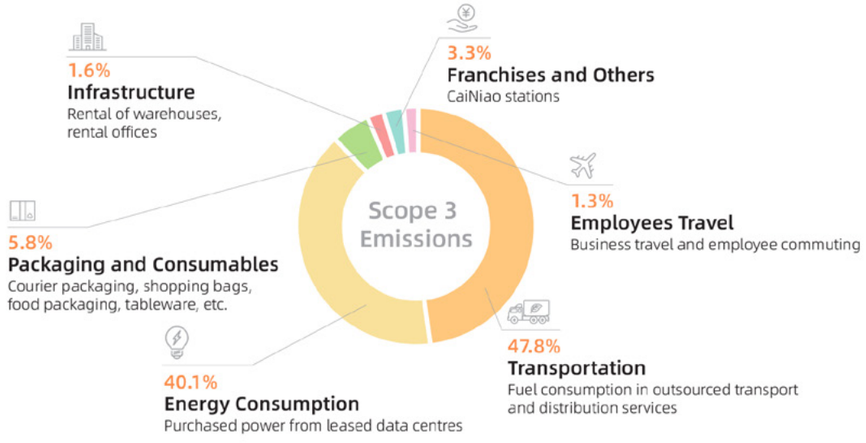
Scope 3 Target: Halve the Emission Intensity Across the Value Chain

In 2020, Alibaba's accounted greenhouse gas emissions along our Scope 3 value chain were approximately 5.294 million $MtCO_2e$. This mainly resulted from fuel consumption in outsourced transportation and distribution services, purchased electricity for leased data centers, the use of packaging materials and consumables, infrastructure operations such as leased warehouses and logistics parks, and employee travel and commuting.

Scope 3 emissions are heavily influenced by upstream and downstream activities along the value chain. A significant portion of emissions, especially those from the use and disposal of products, remain challenging in terms of measurement and reduction. Specifically, our primary mitigation initiatives include

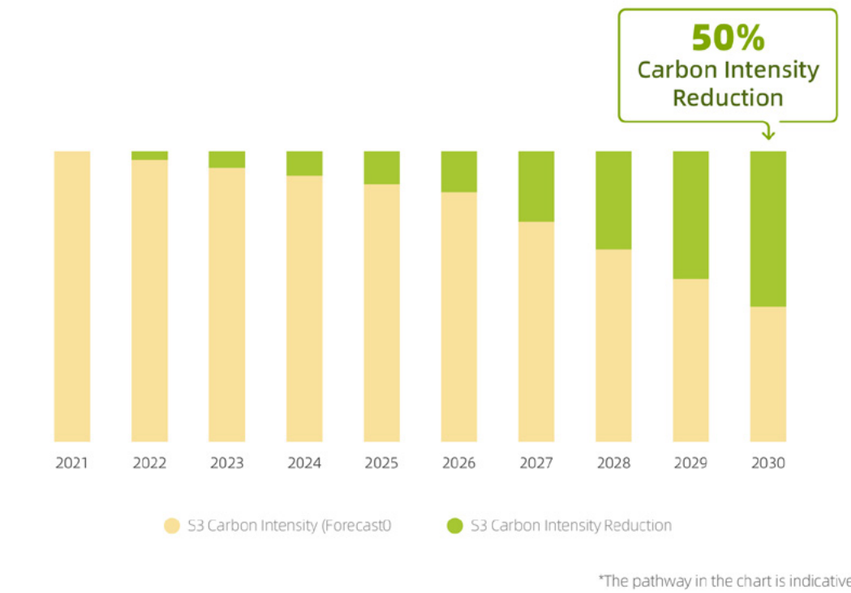
1. innovating in energy efficiency improvement and increasing the use of clean energy, especially in our leased data centers;
2. strategic procurement of logistics and transportation services and packaging, prioritizing suppliers with electric transportation and green packaging capabilities;
3. further reducing carbon footprints of business travel and commutes, including encouraging employees to use car-pooling and company buses;
4. implementing green supplier management plans and green supply chain systems, expanding their coverage, encouraging suppliers to set science-based emission reduction targets, and otherwise helping to accelerate low-carbon transformations of the value chain by providing low-cost solutions and incentive mechanisms to get them into widespread use .

These measures provide the foundations for Alibaba's promise to reduce Scope 3 carbon intensity of revenue by 50% from 2020 to 2030[4].



[4] Based on all the categories covered in the baseline year emission inventory (see Appendix) the economic intensity of Scope 3 emissions is 8.22 $MtCO_2e$ / 1 million RMB revenue.

Scope 3 Emission Reduction Pathway



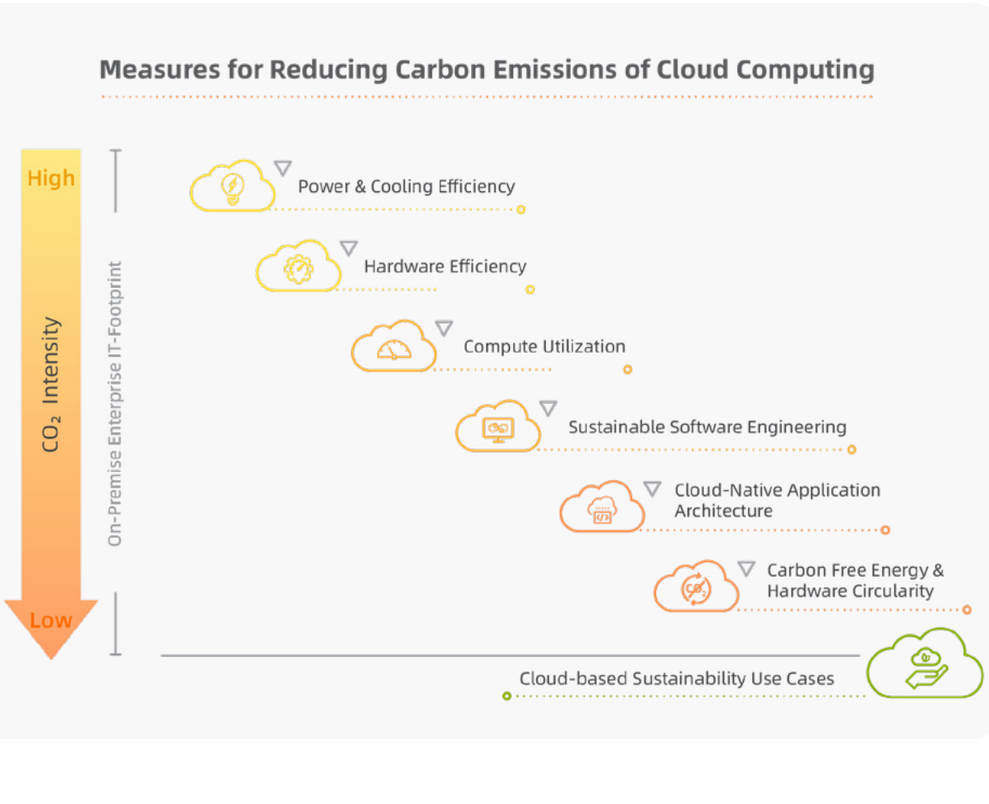
*The pathway in the chart is indicative.

Carbon Neutral Cloud Computing

Cloud Computing is the Digital Infrastructure for the Low-carbon Circular Economy

Cloud computing is the key digital infrastructure for a low-carbon circular economy. Building eco-friendly data centers are critical part of our approach to our own sustainable operations and the transition to a sustainable, prosperous environment. Compared with conventional IT infrastructure, cloud computing reduces carbon emissions through:

1) improving efficiency of power consumption and cooling
2) improving hardware efficiency
3) improving computing efficiency
4) reducing energy consumption through software engineering design
5) improving computing efficiency of cloud-native architecture
6) reducing carbon footprint through using recycled energy and improving hardware circularity in Alibaba's data centers



Analysis by Accenture[5] shows that enterprises migrating from local IT infrastructures to cloud computing reduce carbon their footprint by 84% on average. Promoting the transition to the cloud is a critical measure for carbon reduction and efficiency enhancement not just for Alibaba, but for the broader economy. Alibaba Cloud operates data centers globally across 12 countries, providing real-time data computing and storage services for a number of business platforms and partners. We have been designing and implementing different methods of efficiency enhancements to help global customers to reduce carbon and other adverse environmental impacts of their businesses through continuously improving cloud computing. We are particularly focused on technological innovation and R&D investments in both software and hardware.

In a recent report from Gartner[6], Alibaba Cloud's IaaS infrastructure capability was ranked first among the world's top cloud vendors on the capabilities of four core evaluations of computing, storage, network, and security. Cloud computing data centers are also among the global leaders in the efficient use of energy resources.

In the meantime, our cloud computing data centers are also among the global leaders in the efficient use of energy sources. We are committing to power our cloud computing with 100% clean energy no later than 2030.

[5] Accenture, 2020, The green behind the cloud.
[6] Gartner Solution Scorecard for Cloud-Integrated IaaS and Paas, 2021

Efficiency Enhancement of Cloud Computing

Economies are increasingly digitalized, bringing decarbonization benefits, and yet the data centers that underpin this progress are experiencing fast growth in power consumption and increasing carbon emissions, at least temporarily. Thus, it is extremely important to continuously improve and to develop breakthrough energy efficient technologies. These include software and hardware innovations, and operational improvements so that more and more users and businesses can benefit from this digital dividend.

In our data center engineering, Alibaba's heat dissipation and power supply technology has reached globally leading levels. Water-cooling technology at the East China Data Center ensures costless cooling for 90% of its operating time, driving down energy consumption by more than 80% compared to mechanical cooling. Since 2015, we have deployed the unique "soaking server" cooling technology for our data centers. Our servers are immersed in insulating cooling liquid, and the heat they generate is directly absorbed by circulated cooling liquid. This non-mechanical cooling measure leads to energy savings of over 70% compared to traditional mechanical cooling. Alibaba's Zhejiang Renhe Data Center, which opened in September 2020, has deployed the world's largest cluster of "soaking servers." The power usage efficiency (PUE), the amount of power entering a data center divided by the power used to run the computer infrastructure within it, can reach as low as 1.09, a world leading level. At the Open Data Center Committee (ODCC) 2020 Summit, Renhe Data Center was awarded a green level 5A (design) certification, becoming China's first liquid-cooled data center with this designation.

Alibaba's proprietary Panama Power solution system currently deployed in the data centers can guarantee uninterrupted operation of power supply. The third-generation semiconductor technology adopted by the system reduces system power loss and increases the overall link efficiency

by 3% to 97.5%, leading in China's internet industry. This technology has been recognized the China Communications Standards Association and the International Telecommunication Union. Recently our energy-efficient data centers were awarded a Green Innovation Recognition of Excellence from the 2021 Paulson Prize for Sustainability.

Alibaba's leading hardware and software technologies in cloud computing make possible the efficiency gains we deliver to our own businesses and to those of our business and government partners. Alibaba has developed an innovative chip suite for cloud and edge computing scenarios, from the Xuantie 910 chip processors, to the Wujian SoC all-in-one chip development platforms, and to the Hanguang 800 AI inference chips. Alibaba's proprietary Panjiu servers separate computing from storage to better support cloud-native infrastructure, such as the software behind computer applications that do not use physical servers. This allows servers to be more specialized in AI computing, making large-scale data more cost-effective to deploy.

Alibaba Cloud's Apsara Compute Shenlong Architecture and database provide on-demand services for resource efficiency. Further enabled by our intelligent algorithms, our cloud operating system integrates tens of thousands of servers around the world into one seamless supercomputer, with a real-time peak processing capacity of 3.63TB per second, improving the resource utilization of servers by 10% to 40%, much higher than the industry average. In order to improve the overall computing efficiency, we also launched the "M6" AI model to support e-commerce platforms. Compared with other large-scale models, this model requires significantly less training and computing resources.

Our first proprietary server chip, Yitian 710, independently designed and developed by Alibaba engineers, is the most powerful ARM [Advanced RISC (Reduced Instruction Set Computing) Machine] server chip in the industry. It adopts the most advanced 5nm process and can accommodate up to 60 billion transistors in each chip. The performance exceeds the industry performance benchmark by 20% with a 50 % increase in the energy efficiency ratio.

Recycling Energy and Resources

The growth of Alibaba's cloud computing services has entailed a large number of equipment replacements. We have implemented a systematic IT equipment utilization and recycling program by reconfiguring redundant servers and dismantling available accessories for servers that are replaced. From April 2020 to March 2021 alone, we used old computing resources equivalent to 1.5 million cores through reconfiguration and refurbishment of old servers. Through the recycling of spare parts, the supported computing resources reach 15 million cores. At the same time, we strictly protect customer data, complying with environmental standards by following the requirements of the National Hazardous Waste List, and by carrying out storage medium destruction under the supervision of the environmental protection departments. We recycle nearly 1,000 tons of rare metals and other materials annually.

We are also committed to embedding the principles of the circular economy in energy use management. We further improve the energy efficiency of our cloud data centers through recycling a large amount of waste heat generated by servers. The Zhangbei Data Center has been implemented in cooperation with the government and heating companies, using heat pump technology to supply heat to the municipal heating pipeline network, indirectly supplying heat to enterprises and residents. After the project is completed, the total amount of waste heat recovered will be at least 104 MW, which can support the heating of an estimated 1.8 million square meters of building area. The project can

How Alibaba will Achieve Carbon Neutrality

help reduce energy consumption by 55,000 tons of standard coal each year, equivalent to reducing 135,000 tons of carbon dioxide. At the Zhangbei Data Center, Alibaba Cloud and its partners used the waste heat of the data center for heating in the agricultural greenhouses, opening up innovative demonstration projects for ecological agriculture in the underdeveloped areas of Bashang. We plan to leverage our experience to extend similar waste heat recovery technology to other data centers.

Zhangbei Data Center's Waste Heat Recycling and Reconstruction Project

On September 30, 2021, Zhangbei Data Center completed the Data Center Waste Heat Recycling and Reconstruction Project. Through the heat recycling system, the heat generated by servers is collected and used for heating agricultural greenhouses, to achieve efficient use of heat and reduce carbon emissions. The recycled heat can power a 600-square-meter greenhouse, ensuring the temperature stay between 16-25°C throughout the day. This translates into a saving of 24 tons of standard coal every year. In addition, a 120 cubic meter rainwater collection tank for rainwater and data center waste water will recycle about 8,000 tons of water per year. The heating and irrigation of the greenhouse are recycled and supplied by the data center to meet the 2-3 seasons of needs for planting tomatoes, cucumbers, beans, radishes, and other crops each year, with an annual output of about 12,000 kg.

Logistics Decarbonization

Green logistics is an indispensable part of the low-carbon economy. Digitalization brings new possibilities for the logistics industry to reduce carbon consumption, providing essential support for each of these practices to advance sustainable development. The logistics platform operated by Cainiao is one of the main sources of Scope 3 emissions. The four core segments of packaging, transportation and distribution, warehousing, and final delivery all present challenges and opportunities for emissions reductions.

In the Chinese delivery business, Alibaba pioneered the usage of the digital parcel management tool in 2014 that replaced paper labels with electronic express labels. Previous multi-layer sheets on parcels were replaced with QR codes. Through continuous upgrade and iteration of the electronic label, each package saved four sheets of paper. Given its use in more than 100 billion express parcels, this has saved 400 billion sheets of paper.

Packing cartons form the largest part of our materials consumption. Although the industry in China no longer relies on virgin paper, even recycled paper uses resources. There remains considerable room for efficiency gains. We are continuously making improvements in three aspects of our packaging: package "slimming," packaging material R&D and substitution, and packaging material recycling.

The best packaging, of course, is no packaging. So we promote reductions in both original box and recycled box delivery. At present, 70% of our packages shipped have stopped using new cartons in the two channels of Tmall and Alibaba LST. Since 2018, we have reduced the amount of packaging by developing a number of technical applications such as intelligent box cutting and packaging algorithms, combined with big data algorithms to optimize the design of carton models. The algorithms recommend the most suitable packaging plan to make the boxes match better with the goods, making them more compact, realizing an average reduction of 15% in packaging materials, thus far resulting in 530 million "slimmed" packages.

We are also accelerating the development and application of green packaging materials and exploring the feasibility of replacing non-degradable components (mainly plastics) with non-petroleum-based packaging materials. Cainiao also began to pilot the B2C recycle box delivery program, exploring the promotion of recyclable packaging models to more logistics scenarios.

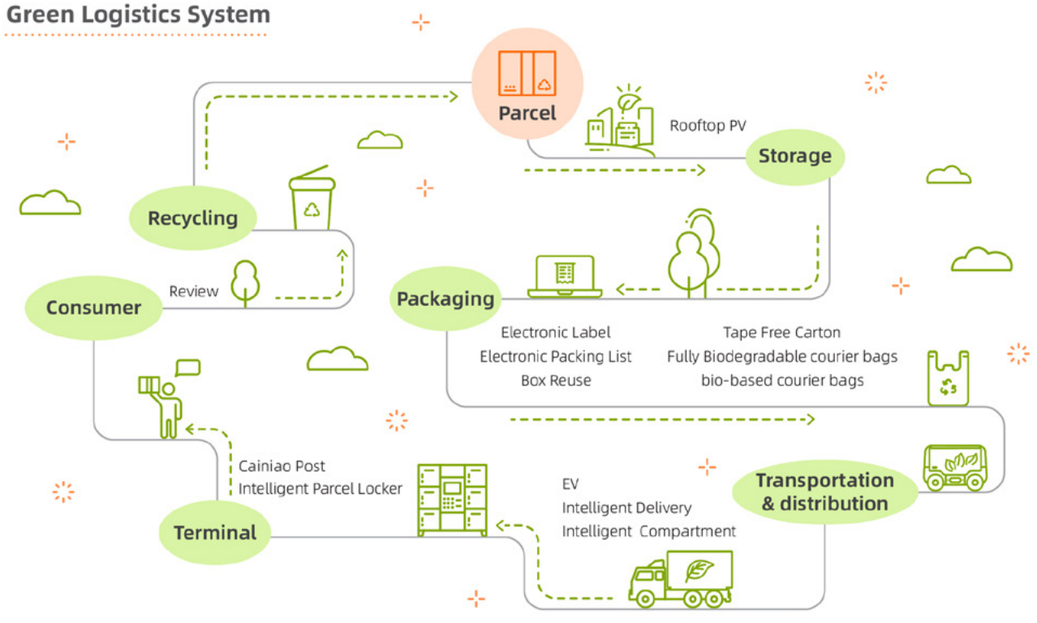
The broader carbon e-commerce footprint owes to transportation and distribution, which together account for more than half of the emissions of Cainiao's entire operational chain. We will begin by launching a clean energy replacement project that replaces all intra-city transportation vehicles with clean energy vehicles by 2030. And we will start to deploy them in long-haul transportation. At the same time, we are also experimenting the unmanned logistics transportation vehicles, dubbed "Xiaomanlv" and "Damanlv." The combination of intelligent logistics and electrification can substantially improve transportation efficiency and play a major role in reducing carbon. Routing is another key component of carbon reduction, and we continue to improve our intelligent algorithms in route optimization.

In warehousing, we are increasing the use of clean energy and upgrading the hardware of facilities. A very important aspect is smart warehousing, so as to optimize sorting and transportation efficiencies, and to reduce transportation volume from unnecessary allocation. In international logistics services, we have applied our "smart consolidation engine" to combine multiple packages for shipment, effectively reducing the demand for international aviation, a key emitter of greenhouse gases. We will also expand overseas warehouses, reducing dependence on air transportation and single-package carbon emissions.

Finally, we are implementing a recycling plan at the endpoint of Cainiao logistics nodes throughout China. At Cainiao stations, we carry out large-scale recycling operations on packages, including recycling non-Cainiao packages to help the larger logistics chain to reduce its footprint. We describe this in more detail in the following chapter on "Scope 3+."

In the long term, we will focus our efforts on research and investment in new technologies, new materials and in new business models. We will continue to explore near-term efficiency improvements. At the same time, we will aim to achieve our ultimate goals, particularly in Scope 3, through more innovative long-term technologies, some of which we hope to unveil in the near future. This will involve outsourcing international logistics and air transportation and distribution services to reduce emissions. For this challenge, there are no short-term panaceas. We will contribute to efforts on the development of biomass sustainable aviation fuel (SAF) technology, which is most needed in the decarbonization of long-distance flights. We will immediately start initiatives to cooperate with suppliers, helping them to choose more low-carbon logistics solutions while supporting the expansion of energy-efficient technologies.

Green Logistics System



Green Procurement

Goods and services purchased by companies are often an important part of Scope 3 emissions. We promise to work in two important ways to reduce our procurement footprint. Firstly, we will continue to expand the scope of our emission accounting methodology to cover more of our purchasing procedures. Secondly, we will apply our digital capabilities to a green orientation in cooperation with our suppliers, to continuously improve our standards of sustainable procurement and help upstream companies in the supply chain reduce their carbon emissions.

In the selection of suppliers for centralized office procurement, we have formulated standards for green procurement, devised green qualification requirements for suppliers, and issued a green supplier label management system. The establishment and continuous improvement of this system will promote carbon neutrality with many supplier partners and make the office procurement platform a place for collaborative green practice creation and sharing.

In our product selection approaches, we offer a few concrete examples. In office provisioning, we are trying to expand the procurement of refurbished second-hand furniture and other supplies to achieve energy saving while maintaining standards of functionality, quality, and safety.

In our selection of services, we have put into place a clear plan to steadily transition to green and low carbon standards in leasing data centers and logistics services, which we will expand to other service procurement. A noteworthy example is in innovatively reducing the footprint of our exhibition and outdoor marketing. In exhibitions, we now select more modular constructions, which helps ensure more reuse of materials. Currently, 80% of wood is reused, and the overall reusable materials account for more than 90% of materials used. Moreover, our material efficiency for our exhibitions has also improved by 30%.

We are steadily extending the existing green qualification requirements for suppliers to more products and services, such as the supply of offline retail products, and will continue to expand their scope.

Employees and Consumers Participation

Finally, we want to note that the realization of Scope 3 emissions reductions requires not just a hierarchical corporate plan but the bottom up incentivization of individual actors. This includes our 250,000 employees and the consumers who directly use Alibaba's products and services.

Starting with ourselves, we encourage our employees to actively participate in GHG emissions reductions in every aspect of their corporate and personal lives. Employees are rewarded for 14 energy-saving and carbon-reduction behaviors in the office, such as turning off lights and air conditioners in idle spaces, using double-sided printing, and recycling cardboard boxes. From June 2020 to August 2021, 120,000 employees finished 750,000 carbon-reduction behaviors, equivalent to 336 tons of carbon emission.

Low-carbon travel choices, such as choosing high-speed rail instead of air, active carpooling, and ride-hailing to pick up colleagues while driving, are all rewarded with points. Employees are actively participating in these arrangements. In the first 10 months of 2021, 16,000 employees took high-speed rail on the Beijing-Hangzhou line for more than 50,000 times; more than 90,000 employees participated in more than 760,000 times of carpooling.

In Alibaba's household consumer business, our retail stores are the points that have the most direct contact with consumers. As such, they are important nodes for advocating green consumption. At present, our work is mainly focused on the replacement of packaging materials and encouraging consumers to recycle.

Regarding our sustainable drive for packaging materials, Freshippo has completed 100% replacement of traditional plastic shopping bags with biodegradable and paper shopping bags in offline stores and has begun to promote the replacement of shopping bags with online delivery services. Sun Art Retail has established standards for the use of consumables, classifying and managing office supplies, and tracking the use of materials on a weekly basis. Meanwhile, policies are issued to encourage suppliers to improve packaging efficiency, to increase the recycling and reuse of cardboard boxes, and to reduce packaging material waste. In 2020 alone, 126,000 tons of waste cardboard were recycled. From 2021, Intime has changed its express packaging to recyclable zipper cartons, discarding the original dyed tape seals. Users can choose to ship directly with handbags instead of additional logistics packaging. This seemingly small change is expected to save at least 15 million shipping cartons throughout the year.

In terms of incentivizing customers, Intime Department Store has offered a cosmetic empty bottle recycling program since 2018. So far, more than 41,000 empty cosmetic bottles have been recycled, and 20,000 will be recycled in 2020 alone. In early 2021, Intime began to provide smart empty bottle recycling machines. Consumers can not only redeem cosmetic samples or receive red envelope rewards, but the most environmentally conscious among them can also convert their rewards into tree planting commitments through cooperation with tree planting agencies the next day. Freshippo launched the "Green Box Area" plan in 2019, which included calls for the use of reusable bags for shopping, and the reductions of plastic bags in stores and surrounding communities. It aims to inspire consumers to join the green box initiative and to join the community's environmental protection culture. For example, consumers who do not buy plastic bags when they consume in Freshippo stores can obtain corresponding tree planting commitments from third-party partners, and 320 million people in a year have been encouraged to participate.

03
Enabling Sustainable Businesses and Green Living

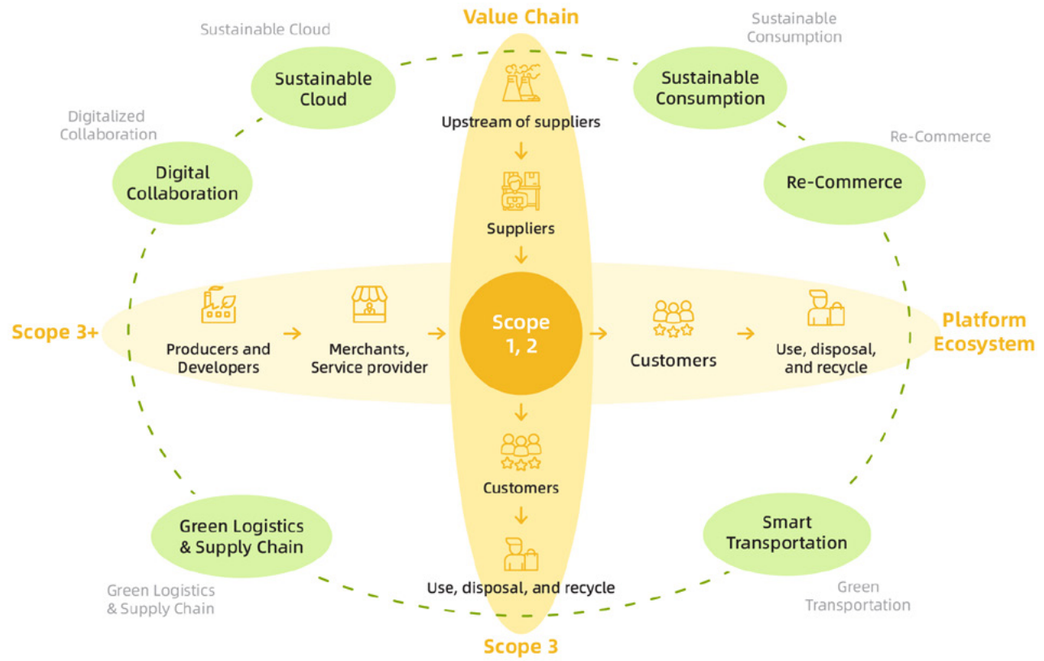
Defining "Scope 3+"

From Scope 1 to Scope 2, and then to Scope 3, corporations have been continuously expanding the boundaries of their carbon reduction responsibilities. Broadly speaking, the Scope 3 of one firm is derived from the Scopes 1 and 2 of other firms. The underlying logic of this double accounting is not only to encourage companies to make ever larger commitments within broader scopes, but also to foster emissions reduction synergies among companies, resulting in greater impacts across the whole of society.

The availability of digital platforms has provided increasing possibilities for generating these synergies. Platform companies can promote emissions-reducing behaviors via technological innovations and new business models, or through establishing rules and systemwide coordination. These broader effects, however, go beyond what can be measured by the metrics we have discussed for evaluating the success of Scopes 1, 2, and 3 for platform builders and operators.

As a result of Alibaba's platform model and ecosystem, we are pioneering the concept of "Scope 3+." Scope 3+ refers to the emissions generated by a wider range of participants in a platform's ecosystem, currently outside of the Scopes 1, 2, and 3. For example, on transactional platform like Tmall, Scope 3+ includes the overall emissions from suppliers, merchants, and customers, including both their operations facilitated by Alibaba's products and services and all other operations.

Our Scope 3+ Target: To Facilitate 1.5 Gigatons of Our Ecosystem Decarbonization by 2035



Notes:
By 2035, we aim to facilitate 1.5 gigatons of business ecosystem decarbonization through the following initiatives on next slide to help the world better achieve the 1.5 ℃ Goal of the Paris Accord.

Scope 3+ is a natural extension of previous scopes. As the illustration shows, we are hoping to expand the focus from a firm's own emissions and that of its supply chains, to a platform's entire business ecosystem, and beyond. It asks on-platform firms and consumers to see more fully their own emissions reduction possibilities as well as their social responsibility to leave to their heirs a planet greener and more prosperous economy. This challenges us to think harder and stretches us to do more, but the potential carbon-reduction benefit to the larger Chinese and world society is, equally, much greater.

Scope 3+ Target: 1.5 Gigatons for 1.5°C, Facilitating 1.5 Billion Tonnes of Emission Reduction Over 15 Years

The use of digital platforms to promote carbon reduction can play a significant role in achieving the 1.5°C target of the Paris Agreement, but the essential data and calculation methods related to carbon reduction metrics beyond Scope 3 are not fully developed. To a degree, this will slow the pace of platform-based innovations around carbon reduction. Therefore, we have initiated the "1.5 Gigatons for 1.5°C" project, leveraging our diverse platforms to achieve a cut of 1.5 billion tons in carbon emissions over the 15 years ending in 2035. We will lead the drive from within our Scope 3+ ecosystem, starting in areas with clearly identified reduction means and potential. Alibaba will work hand-in-hand with governments and expert organizations to develop rigorous measurement methods. In initiating such a challenging project, we set out three major goals:

Firstly, we hope to stimulate a new round of technological and business model innovations within Alibaba, and stimulate our employee's talents into finding new solutions to meet society's most urgent climate-related needs.

Secondly, we hope to unite partners across our digital ecosystem, from brands to merchants, producers to consumers, to collaboratively achieve this transition.

Thirdly, we hope to work with government agencies, research and academic institutions, and certification agencies to develop better digitally enabled carbon monitoring, recording, verification, and evaluation systems and emission reduction solutions. These efforts will help form a solid scientific and technological foundation for the transition.

The 1.5-Gigaton target is ambitious but not out of reach. Over the years, we have made some forays on our platforms that have gifted our engineers with practical experience and corresponding expertise. Starting from existing means and methods, we have confirmed and preliminarily quantified the carbon reduction potential of specific, concrete schemes, such as increasing the sales of sustainable products to promote low-carbon consumer lifestyles. We have developed new business models for second-hand goods trading and recycling. We have also used data and artificial intelligence algorithms to help reduce urban traffic congestion and optimize logistics routes. We have incentivized and otherwise encouraged businesses and consumers to reduce packaging, to avoid secondary packaging, and to use biodegradable materials. We have used low-carbon cloud computing services to help corporate customers to lower carbon reduction costs.

In the following sections, we outline the priority actions Alibaba will take to achieve its Scope 3+ target, building on actual carbon reduction schemes that we have already initiated. The first two pillars of the low-carbon circular economy, energy transition and breakthroughs in science and technology will require the third pillar of stakeholder economy to develop and deploy the needed carbon measurement and reduction. We pledge to work with our business, government and other institutional stakeholders. Each will play a crucial role in both the design and implementation phases, as we work together to meet the 1.5 Gigatons challenge, helping to achieve the Paris Agreement aspiration of a 1.5°C reduction in global temperature.

Priority Actions for Scope 3+ Emissions Reduction

Sustainable Consumption

Consumers are the end users of industrial and agricultural production. In 2017, China's urban and rural residents directly and indirectly emitted about 4.15 billion tons of carbon dioxide, accounting for approximately 40% of total emissions. As living standards continue to improve, the proportion of carbon emissions by citizens will further increase, rising to about 5 billion tons of baseline consumption in 2030. Hence, promoting a transition to greener consumption will produce long-term emissions reduction benefits.

On-platform green consumption is an important Scope 3+ reduction scenario, and one that must be addressed via technological and business model innovations. In an increasingly more eco-aware marketplace, it is possible to promote green products and to influence consumer preferences. Alibaba, a bridge between tens of millions of merchants and more than 1.2 billion consumers, will advocate for green behavior by both groups, boosting the supply of green merchandise, and providing platform services such as green certification and low-carbon logistics. For example, Ele.me, Alibaba's online food delivery service platform has been promoting the "no free cutlery" campaign. In 2021 alone, it has amassed more than 600 million cutlery-free orders. Through these measures, we can help consumers improve their quality of life, while also helping to create increased demand for producers of sustainable goods.

We are increasing the supply and penetration rate of certified green goods on the platform. In the first place, we are encouraging existing merchandise providers to meet national standards in order to join the platform, upon which we would provide sales-boosting support. In view of the relatively small scope of certified products, we will simultaneously advocate for the creation of relevant national standards. In addition, we will invite certification agencies to provide compliance services for merchants right on our platform. We plan to encourage leading brands and merchants on the platform to join us in setting and working toward carbon neutrality.

During the November 11 shopping festival in 2021, green product venues were featured on Taobao and Tmall as part of our plan to ramp up on-platform consumer guidance toward green products. From electrical appliances to electric vehicles, water-conservation products to green foods, we aim to boost consumer familiarity with sustainable products. In addition, incentives can be designed to further encourage environmentally friendly consumer behaviors while the product is in use. It is our goal to expand the size of our environmentally conscious consumer base. In Southeast Asia, sustainable brands collaboration is a key sustainability strategy to accelerate green consumers' education and opportunities to carbon neutrality and even support climate regeneration projects through their purchases. Lazada joins hands with global sustainability leader, Unilever, to make it easier for local consumers to shop for sustainable products. The vision of this unique partnership is to educate and convert 5 million green shoppers across the region and achieve a 50% reduction in virgin plastic use by 2025.

Digitalizing the Re-commerce Market

China recently entered the ranks of middle-income economies. Consumer products are now abundant, but increasing waste has become obvious, revealing vast quantities of unnecessary emissions. Developing a green second-hand economy built on a foundation of environmentally conscious trading and recycling can have a significant impact on emissions reduction, offering important opportunities for helping to fulfill our Scope 3+ goals. Traditional offline second-hand markets lack information and trust mechanisms, making it hard to achieve scale and normalized growth for this segment. Alibaba's Idle Fish leverages digital technology and innovative mechanisms to create a fair and credible trading venue for both buyers and sellers. The platform has stimulated a participatory economy through the efficient trading of second-hand goods.

At present, Idle Fish has more than 300 million users, and is the largest consumer market for second-hand goods in the world. More than 20 million users communicate on the platform daily, and more than 1 million products are traded every day. Complete information on the goods is readily displayed, including original price, for-sale price, used duration, and condition. Buyers and sellers have symmetrical access to information and enter the transaction on equal footing. The use of digital technology is what has made such a large-scale circular economy possible.

First, we continuously innovated on trust building mechanisms and marketplace rules to improve the user experience. We also boosted our supply-and-demand matching technologies to reduce transaction costs and thereby to significantly raise transaction completions. Secondly, we continued to fine-tune trust mechanisms between users. Idle Fish provides intermediary authentication and guarantee services for both buyers and sellers through our inspection function. In addition to minimizing the occurrence of disputes at the outset, we have also set up buyer's community-based "claims courts" to resolve post-transaction disputes.

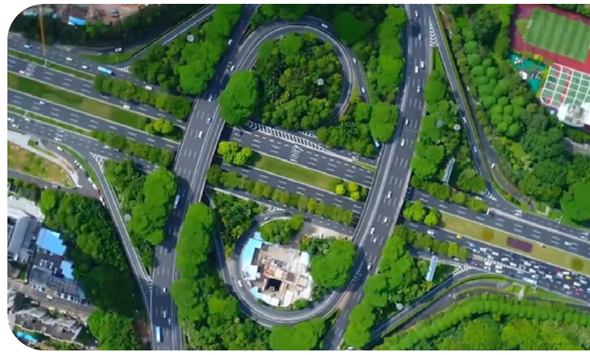
With the development of the second-hand economy and rising public environmental awareness, more emission reduction benefits can be reaped.

Smart Transportation

Transportation accounts for about a quarter of the carbon footprint of a Chinese resident. The average person travels about 6,000 kilometers per year and contributes 1.09 tons of carbon emissions, which offering a huge potential for reductions involving hundreds of millions of users[7]. The key questions are how to increase efficiency when consumers travel and how to encourage them to choose a greener mode of transport via participatory economics. Alibaba's Amap uses intelligent navigation technology and behavioral incentives to promote emission reductions in trillions of vehicle kilometers traveled.

When a user plans a trip on the map, Amap will optimize a route to avoid traffic. Additionally, when users search for routes, priority is given to low-carbon public transport options, guiding users to reduce their carbon emissions. To date, Amap has 400 million users, optimizing 1 billion kilometers in mileage every year.

Making environmentally friendly transportation truly popular requires the combined effort of the



[7] Understand Carbon Neutrality: China's 2020-2050 Low-Carbon Development Action Roadmap, 2021 Institute of Climate Change and Sustainable Development, Tsinghua University.

public, private enterprises, and the government. In order to better measure and encourage carbon reduction behaviors by consumers, Amap and the Beijing Municipal Commission of Transport have collaborated to launch a mobility-as-a-service platform in that city. When the app is used to plan a route, the MaaS platform will guide users to public transportation and display routes that help them optimize for time and transport experience. After the trip, users can obtain incentive prizes upon platform verification of their mobility data. From September 2020 to September 2021, Amap's MaaS activities recorded 4.2 billion environmentally friendly trips. The platform may potentially be rolled out in more cities, providing a complete set of green and low-carbon travel digital options.

Low-carbon Operations and Management

China has the world's largest manufacturing and distribution system. Cloud computing plays a pivotal role in facilitating energy efficient electrification and digitalization processes, and thus is an important carbon reduction tool, especially for SMEs for whom decarbonization is not easy to afford. Recently, Gartner[8] predicted that by 2025, more than 85% of organizations will adopt a cloud-first principle, and more than 95% of new digital workloads will be deployed on cloud-native platforms.

Carbon measurement and carbon management

As noted in the previous section, Alibaba Cloud is developing a variety of products to provide cloud customers with solutions for managing, reducing and avoiding carbon emissions. It not only helps them save energy and reduce emissions from their information technology systems, it also helps them innovate new working methods and lower emissions across production segments. As Alibaba Cloud continues to grow, we can influence more enterprises to accelerate their timelines for achieving emission reduction targets.

Digital synergies for lowering emissions

Digital collaboration has completely changed the way organizations communicate and cooperate, greatly improving enterprise agility and efficiency. This is a main reason of why digitalization can so dramatically reduce GHG emissions. The Alibaba application DingTalk, which serves both enterprise and individual users, has accelerated the widespread acceptance of remote work and collaboration. Emissions avoided as a result of work-from-home arrangements as well as those eliminated by video conferencing contribute to the overall carbon reduction of companies. In addition, many companies have implemented online management processes in human resources and finance through DingTalk. While improving the efficiency of business operations, it also eliminates waste generated by traditional office processes such as paper documents, filling and storage and physical applications and approvals.

[8] https://www.gartner.com/en/newsroom/press-releases/2021-11-10-gartner-says-cloud-will-be-the-centerpiece-of-new-digital-experiences

Energy management for green production

Alibaba's carbon emission management SaaS (Software as a Service) product based on clean energy power generation forecasting and load forecasting algorithms, provides energy-saving suggestions for small and medium-sized enterprises, It integrates a variety of low-carbon certification services on the product. We aim for serving 100,000 SMEs by 2025.

Smart city

Alibaba Cloud products for municipal and local governments help them to improve citizen services. We are developing the "Carbon Eye," a low-carbon, smart supervision system for city governments with functions such as panoramic monitoring of carbon emissions, carbon footprint analysis and tracking, decision-making and regulation, carbon trading, and related public services.

Green Logistics and Recycling

In the past decade, volumes in China's express logistics have grown at an average annual compound growth rate of 43%, and the number of express items delivered per year has exceeded 100 billion items. These types of parcel deliveries bring convenience, but they also bring carbon emissions. Alibaba hopes to lead an effort for all of its logistics participants to reduce emissions in every single express package, thereby pushing the logistics industry toward a low-carbon future.

At present, Cainiao is working on a one-stop green logistics solution, from order generation to package delivery. In addition, we hope to empower upstream and downstream partners to contribute to the transitioning of the entire logistics industry.

Upstream, we are cooperating with merchants to explore sustainable logistics solutions. Relying on inventory data and intelligent algorithms, we are working with merchants in the same industry to model and optimize the box design, and to establish a standardized circulating box system. This greatly cuts down on carton usage from warehouse to warehouse. Owing to our accumulated experience and expertise, we are now providing merchants with a series of green packaging solutions such as carbon-reducing packaging, environmentally friendly materials, recycling containers, and ship-in-own-container services. We are also working with brands including Nestlé, Unilever, and Philips. During Tmall's November 11 shopping festival in 2021, Cainiao encourages a wider range of merchants to use green packaging such as environmentally friendly shipping bags and tape-free zipper boxes.

Downstream, we are trying to turn more than 100,000 Cainiao stations into "capillaries" of our logistics network for practicing principles of a low-carbon circular economy. Consumers are encouraged to bring their used parcel packages to recycling containers located at Cainiao stations, allowing them to re-enter the logistics cycle. To date, the Cainiao Green Recycling Box has been implemented in 315 cities across 31 provinces in China, and it is estimated that hundreds of millions of express cartons can be recycled every year. On the November 11 shopping festival, the program involved 4.8 million consumers across 87,000 Cainiao stations. At the same time, Cainiao has also generated a "personal carbon footprint" account for each consumer, encouraging them to participate in packaging recycling and other circular practices.

In the future, we plan to use the Cainiao stations as nodes for box recycling and the practice of reverse logistics – that is, to allow the materials sent out to have the opportunity to be recovered. It would also give incentives to merchants and courier services to use the Cainiao station recycled boxes, encouraging them to also participate in the circular economy.

Idle Fish is also becoming a testing ground for new recycling business models. China's recycling rate at the end of the product life cycle is relatively low. For example, the recycling rate of mobile phones is only 7%, which is much lower than the 46-66% rate in developed countries. Idle Fish is on the re-uptake end of the circular economy, helping to create new models by integrating consumer-to-consumer (C2C), consumer-to-business (C2B), and consumer-to-business-to-consumer (C2B2C) transactions. Idle Fish can also expand into offline recycling pick-up services and consignment. The business currently supports pick-up service for more than 60 product types. In 2019, Idle Fish recovered nearly 30,000 tons of used clothes, 9.4 million books, 1.2 million mobile phones, and 508,500 large appliances. Such re-commerce models will be recommended to our overseas operations to review opportunities to build low-carbon circular economies in other emerging economies.

Scope 3+: Next Steps

Introducing Scope 3+ and proposing a reduction target of 1.5 gigatons for 1.5°C over 15 years is Alibaba's commitment to society as a platform company. We are committed to supporting our ecosystem partners to reduce their emissions in a way that is consistent with a 1.5°C world. This involves further work to simultaneously stimulate new technology and business model innovations, unite partners, improve carbon monitoring, improve measurement and definition of the scope 3+ concept, encouraging others to reduce their scope 3+ emissions, and also support and invest in reducing scope 3+ emissions in our own ecosystem by 1.5 gigatons over 15 years.

We believe that setting explicit target related to Scope 3+ is of great significance. Residents of China are producing carbon emissions in the billions of tons per year, including both direct and indirect emissions generated in the consumption of goods and services. There is much more room to lower such emissions. Consumer platforms can reach consumers and significantly influence their decision-making. This can be done even though achieving Scope 3+ targets can be challenging and unpredictable.

The Scope 3+ commitment is based on our preliminary quantification of the emission reduction potentials of Alibaba's diverse businesses, we are well aware that the definition, framework, principles, and measurement-related methodologies of Scope 3+ are still nascent. We are committed to further work to define and develop measurement frameworks for this new concept. We will work with experienced specialist groups in China and around the world to launch the "1.5 Gigatons for 1.5°C" project as soon as possible, to include a set of more detailed framework, methodology and mechanisms. On the basis of further scientific research, we will publish a comprehensive feasibility analysis and emission reduction pathway for Scope 3+ in 2022.

Progress on these projects will be reported with the principles of openness and transparency in mind. It needs to be pointed out that Scope 3+ reduction actions should not be confused with the existing scopes. We will follow the basic principles of relevance, completeness, consistency, transparency, accuracy, and other basic principles in evaluating our Scope 3+ responsibilities. We will seek to work with reputable organizations to ensure that the collaborative processes can be tracked and the results can be audited. The ultimate goal is to effectively promote society's emissions reduction and ultimately, a circular economy and a regenerative earth through our actions together with those of our business and government partners.

04
Partnership Ecosystem and Innovation Investment

Partnership Ecosystem

Addressing the climate challenges requires a pivotal change in production and lifestyle at the societal level. Both Scope 3 and scope 3+ emissions are extremely hard to abate and require coordinated and unified actions across all relevant stakeholders. In this sense, the ability to mobilize and guide all parties to participate will determine the success or failure of a company's low-carbon actions. Therefore, it is a crucial part of our carbon neutrality strategy to actively respond to and deeply engage with our partners.

Merchant Partners

At the first China Sustainable Development Summit in 2019, Alibaba co-led in launching an initiative to build sustainable enterprises. We promised to integrate the principles of sustainable development into our core corporate development strategy. At the second Summit in 2021, we reiterated this initiative, emphasized the significance of digital platforms' roles in tackling climate and carbon neutrality challenges, and called on more companies to join the effort.

In practice, during the 11.11 Global Shopping Festival in 2021, Tmall worked with 14 brands to jointly issue a Green Merchant Alliance Initiative to advocate for a choice of low-carbon products and planet friendly lifestyles.

In the future, we will continue to create a broader, still more sustainable business alliance. First, we will cooperate with the top brand merchants on our platform to reach a joint commitment to reduce carbon emissions and collaboratively formulate green business operation manuals, sharing knowledge, resources, and best practices on potential emissions reductions. We will encourage more businesses on the platform to act together and consciously and strategically commit themselves to a science-based decarbonization pathway.

Institutional Partners

A key step in the transition to a sustainable and low-carbon circular economy is establishing science-based and credible standards for measuring carbon and other environmental factors. To that end, we are actively engaged with professional organizations and associations in setting up related environmental standards in China and its overseas trading partners. Furthermore, we plan to cooperate with key domestic and international organizations to form and join alliances to promote sharing and best practices on climate change risk management and carbon neutrality. We have committed to join the Science Based Targets initiative (SBTi), including its "Business Ambition for 1.5° C" campaign to work alongside the world's leading companies in an effort to limit the global temperature rise to 1.5°C, as outlined by the Paris Agreement. Meanwhile, we are cooperating with to study how to maximize the use of the platform network to encourage more widespread business participation in carbon reduction. Next, we also plan to join other important alliances, such as the Renewable Energy 100 (RE100) alliance and the Natural Climate Solutions Alliance, to explore solutions appropriate to our business and platform partners. In South East Asia, Lazada has joined as a member of the Digital Green Finance Alliance Every Action Counts Coalition alongside fintech, ecommerce, and consumer brands to use technologies to reduce carbon and empower 1 billion green digital champions by 2025.

Consumer Partners

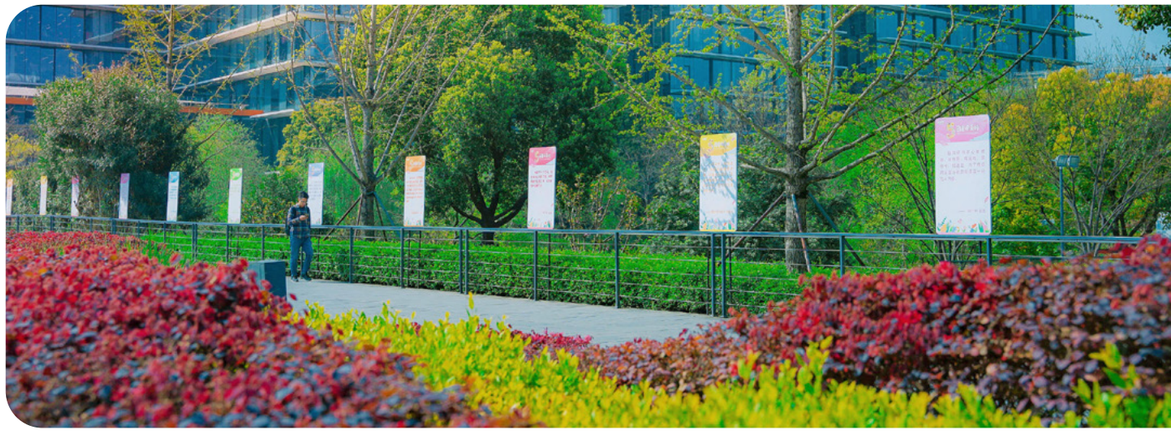
We consider consumers living a nature-caring low-carbon lifestyle as equally important partners and our broadest source of support on the path to achieving carbon neutrality. We are devoted to mobilizing and encouraging the participation of billions of consumers.

We are working with a diverse range of businesses and other organizational partners to synthesize sustainable consumption knowledge and information and plan to provide guidelines to our consumers on a regular base, especially on how to pursue low-carbon living in the digital era. We also are encouraging our retailers to increase their supply of low-carbon products and services, covering our broad platform systems of retailing, travel, catering, etc.

Employee Partners

From our charitable efforts to the low-carbon movement, Alibaba's employees have always been the key actors and supporters of our corporate social responsibility actions. Since 2011, Alibaba has been allocating 0.3% of its annual income as a special charity fund, establishing and nurturing the Alibaba Foundation. Alibaba's charitable endeavors always benefit from a strong employee participation. In 2012, Alibaba launched an employee-led charity committee, where 10 representatives are directly elected by their fellow employees. These Alibaba "charity partners" have a three-year term, and in recent years, the committee has focused on issues including environmental conservation and disaster relief. In South East Asia, Lazada for Good has seeded community impact for the underprivileged and most recently, disasters support. Going forward, Lazada for Good will develop community projects in conservation and engage our employees to contribute.

In the spirit of the social imperative to reach carbon neutrality, our employees have taken the lead in reducing their own carbon footprints. From choosing low carbon travel options to reducing electricity and paper use in offices, many of these actions are promoted. We also encourage environment related topics in employees self-organized clubs and in our internal tech competitions. Employees' proactive participation will be an ongoing critical wellspring of innovation to meet our carbon neutrality agenda.



Innovation Investment

Alibaba's ambitious carbon neutrality commitments means we must proactively and strategically engage in key innovations for the future and dedicate innovation funds for such initiatives and solutions, including a climate-tech solutions fund by Lazada to enable a sustainable digital retail ecosystem in Southeast Asia.

We will actively search and invest in major technological breakthroughs related to our top priorities, including but not limited to the following three areas. First, we will focus on the intersection of digital transformation and energy transition, such as key supplementary technologies to renewable energies; carbon monitoring, recording and verification systems; smart and green building technologies. The second area is related to some of the most challenging emissions reduction sources in scopes 3 and 3+, such as environment-friendly packaging materials and sustainable aviation technologies. We will also pay close attention to carbon removal technologies. This include both nature-based solutions (NbS), such as digital and sustainable agricultural technologies to promote soil carbon storage and blue carbon technologies, and negative carbon technologies (NETs) such as direct air capture (DAC).

In the meantime, we will invest in business model innovations, especially those related to build novel partnerships and incentive systems to promote low-carbon transitions for consumers and SMEs. We will actively position and adapt our efforts within varying policy and social environments in the various regions in order to help facilitate a faster societal level sustainability transition in every place we operate.

05
Governance and Disclosure

To ensure the attainment of our carbon neutrality and broader ESG (Environmental, Social and Governance) goals, we have set up a three-tier governance structure: a sustainability committee at the board level, a sustainability steering committee responsible for daily coordination and management, and ESG working groups within each Alibaba's business units.

At the board level, the sustainability committee holds several important responsibilities: evaluating environmental-related risks and opportunities, holding regular hearings with the management steering committee, reporting regularly to other board members on environment-related matters and providing pertinent recommendations. Committee members will also supervise internal environment-related strategic planning and implementation, review our disclosures on environment-related issues, and provide feedback.

At the second level, the environment-related responsibilities of the Sustainability Steering Committee include: establishing and operating an environment and sustainability department. This unit will be responsible for the management of sustainability issues including setting carbon neutrality goals and designing and implementing strategic plan. We have established a carbon management team to handle all emission reduction-related tasks including establishing a comprehensive digital carbon monitoring, measurement, and management system.

At the third level, the ESG development group comprises representatives from each business unit. It is responsible for coordinating actions across business units, and for ensuring the effective execution of sustainability strategies. In high-emissions business units, we will also install dedicated carbon management personnel responsible for implementing emission management and decarbonization projects.

Externally, we plan to establish a group-level environmental sustainability advisory committee. It will provide expert guidance on technical and environmental impact analysis, on relevant domestic and international policies, on the design of internal and external carbon management mechanisms as well as collaboration on other areas that we hope will achieve "win-win" environmental and economic advancements. In addition to achieving Alibaba's own carbon neutrality targets, the committee will also help us develop plans of broad ecosystem level carbon neutrality efforts with our partners, especially through sharing our digital technologies and business model innovations.

From 2022 onward, we will continue to improve our carbon measurement and management systems, while expanding our monitoring and reporting scopes. In addition, we are committed to making at least one annual disclosure with regard to our carbon emission profile, actions, and milestones, in accordance with domestic and international standards.

Appendix

06 Appendix

Important Legal Information

This report contains forward-looking statements. These statements are made under the "safe harbor" provision under Section 21E of the U.S. Exchange Act, and as defined in the Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words or phrases such as "may," "will," "expect," "anticipate," "future," "aim," "estimate," "intend," "seek," "plan," "believe," "potential," "continue," "ongoing," "target," "goal," "is/are likely to" or other similar expressions. These statements include, among other things, statements about our strategies to achieve carbon neutrality and the effectiveness of our strategies and initiatives.

Forward-looking statements involve inherent risks and uncertainties. A number of factors, including those described in Alibaba's annual reports and other filings with the U.S. Securities and Exchange Commission and announcements on the website of the Hong Kong Stock Exchange, could cause actual results to differ materially from those contained in any forward-looking statement.

The forward-looking statements made in this report relate only to events or information as of the date on which the statements are made in this report and are based on current expectations, assumptions, estimates and projections. Alibaba undertakes no obligation to update any forward-looking statements to reflect events or circumstances after the date on which the statements are made or to reflect the occurrence of unanticipated events, except as required under applicable law.

Information referenced in this report, including other Internet sites and third-party reports and publications, is not incorporated into this report. For the reader's convenience only, this document may provide the addresses of, or contain hyperlinks to, third-party websites. Alibaba Group has not reviewed such hyperlinks and takes no responsibility for the content therein.

The inclusion of information in this report should not be construed as a characterization regarding the materiality or financial impact (or potential impact) of that information. For more comprehensive information about our results and operations, including risks that could adversely affect our results of operations and financial condition, please refer to our annual reports and other filings with the U.S. Securities and Exchange Commission and announcements on the website of the Hong Kong Stock Exchange.

Greenhouse Gas Emissions Inventory Standards

This inventory covers Scope 1, 2 and partial Scope 3 GHG emissions of Alibaba in 2020 within the organizational and reporting boundaries. The types of GHGs involved in this inventory include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF_3) and sulphur hexafluoride (SF_6). Through the inventory, five GHG emissions including CO_2, N_2O, CH_4, HFCs and SF_6 are involved during the reporting period.

In accordance to ISO 14064-1: 2018 Specification With Guidance at The Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals, Greenhouse Gas Protocol: Corporate Accounting and Reporting Standard, Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard, ISO 14064-3: 2019 Specification with Guidance for the Inventory and Validation of Greenhouse Gas Statements and other applicable laws, regulations and related standards, we conduct an inventory of Alibaba's GHG emissions and removals during the inventory period (2020 calendar year). GHG emissions activity data strictly meet the quality requirements of relevant primary and secondary activity data. The emission factors come from 2006 IPCC Guidelines for National Greenhouse Gas Inventories published by Intergovernmental Panel on Climate Change (IPCC) in 2006 and 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, 2019 China Energy Statistical Yearbook and other authoritative references. All processes follow the internal GHG emission inventory quality control procedures of the China Environmental United Certification Center (CEC), and strictly meet the requirements of the ISO14064-3 standard.

Greenhouse Gas Emissions Inventory Boundaries

Scope	Emission Category	Emission Source
Scope 1: direct emissions from company-owned and controlled resources	Stationary Emissions	Emissions from the use of natural gas of boilers and cookware, and diesel for diesel generators
	Mobile Emissions	Emissions from diesel used in owned vehicles
		Emissions from employee commuting
	Fugitive emissions	Emissions from leaking fire extinguishers
		Refrigerant leakage
		Leakage of SF_6
Scope 2: indirect emissions from consumption of purchased electricity, heat, and steam	Purchased Electricity	Production equipment and auxiliary facilities /Production equipment and auxiliary facilities
	Purchased Heat	Production equipment and auxiliary facilities / Indirect emissions from heat used in daily use equipment
	Purchased Cooling	Production equipment and auxiliary facilities / Indirect emissions from cooling for daily use equipment
Scope 3: all other indirect emissions	Purchased Goods and Services	Packaging materials, logistics services, data center operations and maintenance services, data center cloud computing, receipt, poster etc.
	Upstream Transportation and Distribution	Purchased transportation services
	Business Travel	Emissions from employee travel
	Employee Commuting	Emissions from employee commuting
	Upstream Leased Assets	Warehouse
	Downstream Leased Assets	Self-built office campus and shopping malls for lease, ticket machine
	Franchises	Cainiao Stations, Franchise stores
	Investments	Investments in TV plays and shows

Greenhouse Gas Emissions Verification Statement

BUREAU VERITAS
Certification

BUREAU VERITAS 1828

GHG EMISSIONS VERIFICATION STATEMENT

gives to

Alibaba Group Holding Limited

Bureau Veritas Certification (Beijing) Co., Ltd (BVC China) was engaged to conduct an independent verification of the greenhouse gas (GHG) emissions reported by Alibaba Group Holding Limited (Alibaba Group) registered in Offices of Trident Trust Company (Cayman) Limited, Fourth Floor, One Capital Place, P.O. Box 847, George Town, Grand Cayman, Cayman Islands for the period stated below. This Verification Statement applies to the related information included within the scope of work described below.

The determination of the GHG emissions is the sole responsibility of Alibaba Group. BVC China's sole responsibility was to provide independent verification on the accuracy of the GHG emissions reported, and on the underlying systems and processes used to collect, analyze, and review the information.

Boundaries of the reporting company GHG emissions covered by the verification:

- Operational Control
- Headquarter and branches, worldwide

Emissions data verified:

- **Scope 1:** 510,026 metric tons of CO_2 equivalent
- **Scope 2:** 3,709,747 metric tons of CO_2 equivalent
- **Scope 3:** 5,294,467 metric tons of CO_2 equivalent consisting of:
  - Purchased Goods & Services
  - Upstream Transportation and Distribution
  - Business Travel
  - Employee Commuting
  - Upstream leased assets
  - Downstream leased assets
  - Franchises
  - Investments

Data and information supporting the Scope 1, Scope 2, and Scope 3 GHG emissions assertions were historical and, in some cases, estimated in nature.

Period covered by GHG emissions verification:

- January 1, 2020 to December 31, 2020

GHG Reporting Protocols against which verification was conducted:

- ISO 14064-1:2018 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
- World Resources Institute (WRI)/World Business Council for Sustainable Development (WBCSD) Greenhouse Gas (GHG) Protocol Corporate Accounting and Reporting Standard (Scope 1 and 2)

BUREAU VERITAS
Certification

- WRI/WBCSD Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (Scope 3)

GHG Verification Protocol used to conduct the verification:

- ISO 14064-3:2019 Greenhouse gases - Part 3: Specification with guidance for the verification and validation of greenhouse gas statements

Level of Assurance:

- Reasonable

GHG Verification Methodology:

- Interviews with relevant personnel of Alibaba Group
- Review of documentary evidence produced by Alibaba Group
- Review of Alibaba Group data and information systems and methodology for data collection, aggregation, and analysis; review of information used to determine GHG emissions at Alibaba Group Hangzhou Headquarters, and
- Audit of sample of data used by Alibaba Group to determine GHG emissions

Assurance Opinion:

Based on the process and procedures conducted, in our opinion, the reporting company's assertion of their scope1, scope 2, and scope 3 emissions by category, as reported in the inventory report:

- is in conformance with the ISO 14064-1:2018, GHG Protocol Corporate Accounting and Reporting Standard (Scope 1 and 2), and GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (Scope 3).

It is our opinion that Alibaba Group has established appropriate systems for the collection, aggregation and analysis of quantitative data for determination of these GHG emissions for the stated period and boundaries.

Statement of independence, impartiality, and competence:

The Bureau Veritas Group is an independent professional services company that specializes in Quality, Health, Safety, Social and Environmental management with over 190 years history in providing independent assurance services.

No member of the verification team has a business relationship with Alibaba Group, its Directors or Managers beyond that required of this assignment. We conducted this verification independently and to our knowledge there has been no conflict of interest.

The Bureau Veritas Group has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities.

Lead Verifier: Max Zhang

Authorized Signatory

December 6th ,2021

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Alibaba Group
阿里巴巴集团