恒安國際集團有限公司
HENGAN INTERNATIONAL GROUP CO., LTD

(Incorporated in the Cayman Islands with limited liability)
Stock code: 1044

CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD) REPORT 2022

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CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD) REPORT

Currently, climate change has become a common challenge for humanity, posing a threat to the development and stability of the economy and society. At the 27th session of the Conference of the Parties (COP 27) of the United Nations Framework Convention on Climate Change (UNFCCC) (《聯合國氣候變化框架公約》) held in 2022, the urgency of climate crisis was highlighted, calling for collective efforts to combat climate change and achieve ambition under the Paris Agreement (《巴黎協定》).

In 2020, China officially announced its "dual carbon" goals of reaching peak carbon emissions by 2030 and carbon neutrality by 2060. Since then, China has been working on the "dual carbon" top-level design and "1+N" policy system, paving the way to comprehensive green transformation and well-aligned carbon reduction by intensifying the fulfilment of responsibilities.

As an environmentally and socially responsible paper production company, Hengan International Group Co., Ltd. (Hengan or the Group) is keen on refining the climate governance and overall Environmental, Social and Governance (ESG) management level, and pursuing low-carbon transformation in various measures directed by climate-related strategies and goals that we established. Since the first annual ESG Report was released for 2016, Hengan secures information transparency and stays open to supervision from stakeholders.

Currently, the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) is the most influential and widely recognised standard for climate information disclosure in the world. As of the end of 2022, nearly 4,000 organisations (over 200 of which from China) from over 100 countries and regions have become supporters of the TCFD Recommendations. By productively and voluntarily adopting the TCFD framework, Hengan identifies climate-related risks and opportunities that are material to businesses, and develop corresponding action plans to enhance climate resilience. In 2022, we delivered our first TCFD report for climate-related financial disclosures, enhance the disclosure of the extent of the climate related information.

On top of that, Hengan acts on the "dual carbon" strategy to contribute to the domestic carbon undertaking, has joined the Carbon Neutrality Professional Committee of the China Energy Conservation Association as vice-chairman, determined to achieve sustainability and willing to work with all parties in fighting against climate change.

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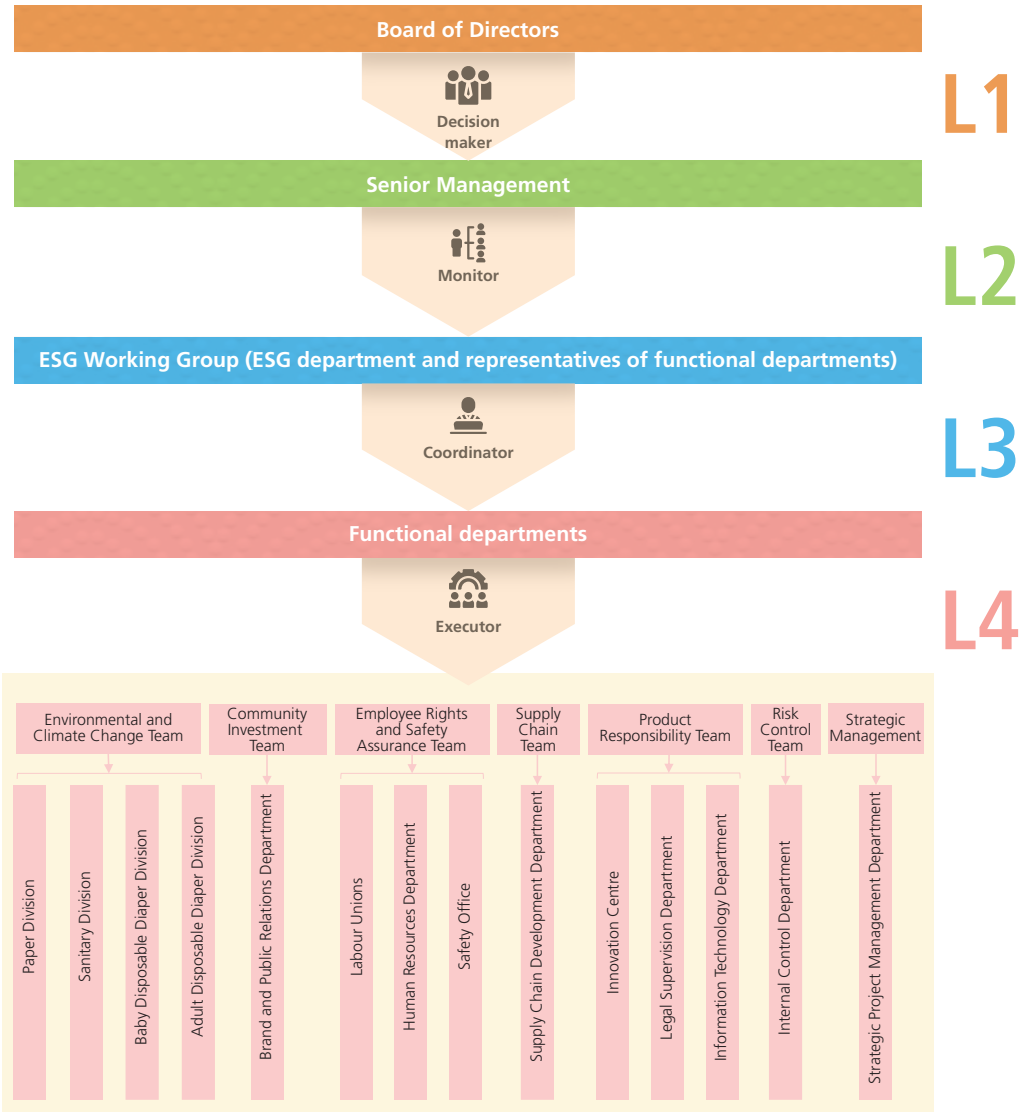
1. GOVERNANCE

With a strong belief that, an organisational focus on climate-related issues is core to the integration of climate governance into business operations, the Group factors responses of climate-related risks into its daily decision-making and management. Based on this, the top-level ESG design was further refined, with a top-down four-level ESG and climate governance structure developed. Specifically, the structure consists of Board of Directors, senior management, ESG working group and every related functional departments, responsible for the monitoring, coordination, and execution of ESG and climate-related issues. Members under this structure are committed to practising ESG and climate governance throughout operations, and solidly driving the Group towards a more sustainable future.



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1.1 Board of Directors

As the highest decision-making body for climate-related issues, the Board of Directors, based on business operations and stakeholders demands, identifies and monitors climate-related risks and opportunities, and gets more involved in roles to:

- regulate and make decisions on the Group's ESG & climate change matters
- develop ESG & climate change management mission, policy and strategy
- review ESG & climate change-related goals
- approve the release of ESG report and TCFD report and disclosure of information

In 2022, after attending two semi-annual briefings with regard to ESG and climate change-related issues, where the latest trends and compliance requirements, the Group's climate-related work arrangement and performance, external stakeholders demands and recommendations for low-carbon trip were presented, the Board of Directors were highly supportive of our current climate strategy.

1.2 Senior management

Senior management, the supervisory body, shall report climate-related work annually to and be monitored and reviewed regularly by the Board of Directors for its responsibilities under the Board's strategy:

- identify, assess and manage significant ESG & climate change-related issues and risks to the Group's business
- determine ESG & climate change management goals and formulate ESG & climate change strategic plan
- oversee the implementation of ESG & climate change plan and work
- confirm with the Board of Directors in respect of the effectiveness of ESG & climate change risk management and internal control system
- supervise the release of ESG Report and TCFD Report and disclosure of information

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1.3 ESG working group

ESG working group is the coordinating body that composes of ESG department and representatives of functional departments, responsible for the following ESG & climate change-related work:

- maintain risk management of ESG reporting and TCFD reporting, also the internal control system
- carry out ESG reporting and TCFD reporting, and implement ESG & climate change strategies and goals
- collect ESG & climate change data and information regularly
- prepare ESG Report and TCFD Report

1.4 Functional Departments

Functional departments, as a base, steadily support the coordination of climate-related issues and execute tasks assigned by superiors:

- Cooperate with ESG working group in implementing ESG & climate change related work to each functional department

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2. STRATEGY

In response to the *Paris Agreement* (《巴黎協定》), China's "dual carbon" goals and UN SDGs, the Group has incorporated climate-related risks into its comprehensive risk management framework. Continuous efforts were made for green growth and clean production, stricter monitoring and disclosure of climate-related information, and refined management and assessment mechanisms, making the Group more resilient to climate impacts.

The Group deepened cooperation on sustainability with partners and urge them to build up climate resilience through appropriate actions, thus promoting sustainable transition along the value chain to jointly address climate change.

2.1 Climate-related risks

Senior management and the ESG working group are jointly responsible for identifying, defining and assessing annual material climate risks, with the discussion results confirmed by the Board of Directors. The Group formulates targets and countermeasures based on the assessment of climate change risks, and monitors, assesses and reviews the policies, management, performance and target progress on climate change-related matters.

Climate risks are divided into transition risks and physical risks：

- Transition risks represent economic or financial risks occurring when factors such as climate change policy, technology innovation, market sentiment and consumer preference affect the valuation of enterprise assets, mainly stemming from strengthened decarbonisation requirements;
- Physical risks represent risks of extreme or abnormal weather events directly causing damage to economic activities, including event-driven impacts and long-term change in climate patterns.

In 2022, Hengan identified the following short-term (1–3 years), mid-term (3–5 years), and long-term (5–10 years) climate-related risks in both transition and physical dimensions:

Risk category	Risk type	Risk factor	Impact horizon
Transition risks	Policy and legal risks	Tightened policies	Medium-to long-term
		Increased pricing of GHG emissions	Medium-to long-term
	Market risks	Consumer's green preference	Medium-to long-term
		Lack of raw materials	Medium-to long-term
Physical risks	Chronic risk	Rising average temperatures	Long-term
		Water shortage	Long-term
	Acute risk	Frequent extreme weather events	Short-term

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Transition risk

Risk type	Risk factor	Impact horizon
Policy and legal risk	Tightened policies	Medium- to long-term

Risk analysis

- In the 2023 *Global Risks Report* (《全球風險報告》), the World Economic Forum listed "Climate action failure" as the global risk that will have the most serious impact in 10 years, and the Intergovernmental Panel on Climate Change (IPCC) also raised concerns about achieving the goal of keeping the temperature rise within 1.5°C in the Paris Agreement. Under this urgent situation, various countries and regions have increasingly strict regulations on carbon emissions. The Chinese government has also put forward the requirements of strengthening energy conservation and emission reduction and promoting green and low-carbon development of the paper industry. Enterprises may be exposed to compliance risks in policy and legal supervision if they fail to accelerate the formation of management and production methods conducive to carbon reduction, resulting in increased operating costs;

- Domestic and international gradually tighten product controls on the sustainable level, including the environmental impact of disposable plastic products (wipes, etc.), the use and recycling management of plastic products, whether the products meet the requirements of "zero deforestation", etc. Therefore, improper management of raw materials and packages would lead to incompliance risks in policy and legal supervision, resulting in increased operating costs.

Risk response

- Hengan continuously improves energy efficiency by upgrading equipment, improving management and etc., while optimising energy structure by photovoltaic clean energy, to practice green and low-carbon development. Since 2020, the Group has set and published quantitative energy conservation and emission reduction targets, which are monitored and reviewed annually. In 2022, the energy consumption per unit product of the papermaking sector of the Group was 25% lower than the advanced value requirement of the nation standard, which was at the leading level in the industry;

- Pay attention to policy and regulatory developments and carbon trading information, and timely formulate, modify and implement internal policies, thus decreasing compliance risks of carbon-related policy and regulation;

- Focus on relevant policies of plastics governance and carry out internal sustainable projects, including planning a sustainable development platform for plastics, and developing sustainable material technologies under the principle of reduction, reuse, recycling and degradability, to reduce compliance risks of plastics governance domestically and internationally;

- Prefer suppliers that use environmentally friendly products and services, and regularly conduct the ESG risk evaluation and on-site audit on suppliers, including indicators of environmental management, environmental emergency, environmental impact, etc. Encourage suppliers to keep track of policy and regulatory trends and implement valid energy-saving measures through supplier conference and other activities. Select legal, traceable and renewable wood with a clear origin for pulp production, establish extremely strict criteria for the selection of raw material suppliers, and require suppliers to abide by the Group's paper pulp purchase standards, thus lessening compliance risks in the supply chain.

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Risk type	Risk factor	Impact horizon
Policy and legal risk	Increased pricing of GHG emissions	Medium- to long-term

Risk analysis

- Centred on the target of tackling climate change, governments around the world have formulated and implemented a series of strategies, measures and actions to tackle climate change, and put forward more ambitious carbon emission control targets. The European Union (EU) has formally adopted the European Carbon Border Adjustment Mechanism (CBAM) agreement, which will in future impose carbon tax on some goods exported to the EU. The Chinese government has issued a series of regulatory policies and systems related to carbon emissions. The paper industry is one of the eight industries included in the first batch carbon emissions trading market. Under the requirement of carbon peak and carbon neutral, optimizing energy structure and promoting green development have become the inevitable choice for industrial survival and development;

- Several production companies, including Hengan (China) Paper Co., Ltd., Weifang Hengan Thermal Power Co., Ltd., and Hengan (Chongqing) Living Paper Co., Ltd., have been listed as key emitting entities, and shall surrender a number of Chinese Emission Allowances to the government corresponding to the emissions they were assigned during a compliance period. It is expected that the growing carbon market more enterprises will be involved. Enterprises shall improve carbon emissions monitoring and management, and adopt green and low-carbon technologies in time. Otherwise, they will need to buy Chinese Emission Allowances from the market when the actual emissions exceed the cap, or may be punished for the failure to timely offset the emissions in full. In such cases, enterprises are under great pressure from improving carbon related costs.

Risk response

- Establish and improve the energy conservation and carbon reduction management system. Hengan will set medium and long-term energy consumption targets per unit of production to reduce the carbon footprint of products;

- Install a Demand Side Management Platform to monitor the energy consumption of the equipment in real-time;

- Hengan continues to innovate and adopts energy-saving and emission-reduction technologies. Specifically, the Group adopts global advanced technologies and equipment such as full servomotor, frequency conversion power-saving technology and turbine technology, and actively carries out technical transformation projects such as low nitrogen combustion transformation technology;

- Optimise the energy consumption structure and actively promote the use of renewable energy.

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Risk type	Risk factor	Impact horizon
Market risk	Consumers' green preference	Medium- to long-term

Risk analysis

- Sustainable consumption is expected to be a disruptive force and an important value driver in the future as consumer concerns about climate change rise. Failure to grasp changes in consumer attitudes and improve the environmental sustainability of products in a timely manner for the enterprises will result in the risk of losing a large number of high-quality consumers with environmental protection awareness.

Risk response

- The Group promotes forest certification of products, maintains the high proportion of certified raw materials procured, and gradually pushes forward "forestry-pulp-paper integration" for sustainable operation driven by the market mechanisms;
- The Group remains highly keen on market and consumer demands. Relying on the production scale and technological advantages, the Group is committed to developing products and technologies which are environmental-friendly and sustainable, such as "Slim & Comfort" diapers, which were sold well in the reporting period, reducing potential loss in the green market and consumers;
- The Group continues to pay attention to the environmental friendly of products and launch upgraded products. Hengan strives to build an eco-friendly brand by advocating environmental friendly with concrete actions, thus establishing a brand association with environmental friendly among customers.

Risk type	Risk factor	Impact horizon
Market risk	Lack of raw materials	Medium- to long-term

Risk analysis

- Hengan is committed to the development of green and low-carbon products, adheres to responsible procurement, and formulating stringent requirements on raw materials in terms of safety, environmental protection and sustainability. Since China lacks raw materials for papermaking and relies greatly on imports of paper pulp, along with strong regional trade and protectionism due to timber shortage and other conditions, high-quality raw materials become scarcer compared with the past. This will interrupt the supply chain of raw materials and lead to higher product costs. In addition, other products in the market, such as textiles made from cotton alternatives, share a slice of forest raw materials that are already in short supply.

Risk response

- Help suppliers promote forest certification and encourages them to adopt Forest Stewardship Council (FSC) standards. Regular on-site supplier visits are also arranged to promote sustainable forest stewardship;
- Improve the mass efficiency of products by reducing the consumption of forest raw materials such as fibre per unit product;
- Innovatively launch products take use of bamboo as raw materials. As bamboo has a shorter growth cycle, which may protect forest resources more effectively.

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Physical risk

Risk type	Risk factor	Impact horizon
Chronic risk	Rising average temperatures	Long-term
Risk analysis		
• As global warming proceeds, ongoing heat waves scorched most countries and regions. The extreme weather may hamper operations in warehouses, bring up electricity costs from the use of cooling equipment and affect product quality such as discolouration of packaging films. Both human and material resources may be greatly consumed; • Frequent wildfires caused by high temperatures may strike the production of wood pulp and disrupt the raw materials supply.		
Risk response		
• Install cooling and refrigeration equipment such as fans in the warehouse while choosing efficient and energy-saving types to save energy consumption and electricity cost; • Set up networked meters in the warehouse to monitor the temperature and humidity of the warehouse in real-time and give early warning in case of abnormality; • Build up sustainable supply chain, promote the steadiness and resilience of the supply chain.		

Risk type	Risk factor	Impact horizon
Chronic risk	Water shortage	Long-term
Risk analysis		
• The researches have proved that the world is facing serious water crisis. By 2030, global freshwater supplies will be 40% short, with more severe shortages in water-stressed regions. As papermaking requires a huge amount of water, water shortage may reduce capacity or disrupt operations, while water shortage may also impact upstream raw material supply.		
Risk response		
• Assess the water risks, promote the application of water-saving technologies, and strengthen the recycling of water resources; • Establish reservoirs in the factory to reduce the negative impact on production due to drought or water outage; • Formulate different logistics and transportation plans to make land transport available during the dry season in place of water transport, so as to ensure uninterrupted logistics.		

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Risk type	Risk factor	Impact horizon
Acute risk	Frequent extreme weather events	Short-term
Risk analysis		
• Frequent rainstorms and typhoons will disrupt production, storage, transportation and other processes (e.g., water seepage in warehouses), with post-disaster reconstruction and insurance cost rising; • Water transport may be hindered by seasonal drought, and switched to land transport with higher costs; • Employee travel may be affected, threatening employee health and production safety.		
Risk response		
• Formulate business continuity plans, manage the impacts of climate risks during transportation, and strengthen the flexibility and resilience of logistics; • Select several raw material suppliers in different locations to cope with regional extreme weather risks such as floods and typhoons, thus ensuring the supply of raw materials; • Break exclusive supply and plan to expand supply regions and countries to minimise supply risks due to regional climate issues; • Identify potentially significant risks facing key suppliers and assess the climate-related risks in the place where the supplier is based; • Pay attention to the early warning of extreme weather disasters in the place where each supplier is located in real-time for timely response and remediation when the procurement site is exposed to wildfires, floods and other types of extreme weather; • Shift order production in areas where extreme weather has caused capacity stagnation to normal areas; • Establish a safe warehouse to handle order turnover in typhoons, storms and other extreme situations.		

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2.2 Climate-related opportunities

During the transition to a low-carbon economy, Hengan identifies climate-related transition risks and physical risks, and seizes the opportunities to thrive. With employees, suppliers and consumers, we drive product innovation, practice low-carbon operation, build sustainable supply chain, and deliver concept of environmental protection in a bid to promote emissions reduction along the value chain.

Providing sustainable offerings

With more policies formulated to ban or limit plastics use by governments around the world, and heightened environmental awareness of all, green consumption has become most people's first choice, driving demands in the low-carbon products market. Adhering to the green transition context fostered by policies, markets, and other factors, we consider natural, biodegradable, and reduction of materials and products while researching and designing. Besides, we join hands with responsible upstream and downstream supply chain, research institutes and universities to work on environmentally friendly products' application, thus seizing opportunities in sustainable product market on the way to becoming an industry pioneer.

- We develop natural plant fibres, such as bamboo fibre fluff pulp and soybean fibre non-woven fabrics, and technologies suit fibre performance improvement. Raw materials and processes are optimised to increase the proportion of wood pulp in wood pulp spunlace wipes;

- Devoted in researches and promotion of biodegradable materials, we cooperate with suppliers, universities and research institutes in this area to deliver overall solutions for green materials, leveraging external material application platform, our application evaluation criteria and market development advantages to carry out the biodegradable materials researches and applications. In addition, we greatly encourage the use of biodegradable Polylactic Acid fibre (PLA fibre) spunlace fabric, and launch biodegradable cotton tissue that is 100% made of tropical wood fibre, fully biodegradable plastic bags, etc.;

- We reduce materials used for products and packaging through design improvement and lightweight materials. For instance, we have developed the "polypropylene + polyethylene" two-layer pack films for high-speed high-barrier wet wipes, reducing the plastics use by 11.76% with thinner films. Our new offering, Space 7 ultra-thin cotton products, weigh less and use fewer materials without affecting consumer experience.

Engaged in R&D of sustainable materials and industry exchanges, Hengan moves toward a low-carbon circular economy. As the vice chairman of the Green Recycled Plastics Supply Chain Joint Working Group (GRPG), Hengan played a part in formulation and revision of industry standards for plastics use, including the *General Rules for Assessing Easy-to-Collect and Easy-to-Recycle Designs of Plastic Products* (《塑料製品易回收易再生設計評價通則》). Apart from that, Hengan deepened cooperation with suppliers on biodegradable materials, exploring new models and paths for green industrial development to further reduce plastics use at source. In 2022, at the Green Recycled Plastics Supply Chain Seminar held by GRPG, Hengan, together with other parties, shared experience on building green recycled plastics supply chain system and discussed future trend of plastics circular economy.

Improving sustainable operation

The Group continuously explores opportunities to improve energy efficiency, so as to achieve the purpose of reducing energy consumption and greenhouse gas emissions.

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In the process of production, we have built a Demand Side Management Platform and a system of paper energy management centre to monitor in real-time energy data of each subordinating production company and base, detect abnormalities for improvement, explore opportunities of power-saving operation, thus improving electricity efficiency in an all-round manner. According to our planned electricity use strategy in factories, the electricity supply depends on the output to reduce unit electricity consumption of products. As a result, the electricity consumption per tonne of paper in paper production sectors in 2022 is 9 kWh less than that in 2021. To achieve energy conservation and greater energy efficiency, we have also applied several energy-saving technologies and equipment, including full servomotor, heat recovery boiler, turbine, and dryer end cover insulation technology.

With respect to warehousing, the Group vigorously promotes digitalisation, visualisation and informatisation to regulate energy use for greater energy efficiency. In the factory, the Group replaces manual operations with automated equipment, thus accomplishing unmanned operation process, and also develops vertical transportation and translational delivery, so as to improve overall operational efficiency and save the energy. Additionally, we focus on energy efficiency in the construction of warehouses, and build automatic stereoscopic warehouses in large production bases to balance the storage demand in off-season and peak seasons, so as to reduce the floor area of warehouses and energy consumption in logistics. In addition, considering that greater logistics efficiency contributes to shorter logistics turnover period, Hengan has removed ordinary warehouse projects under a situation of inventory reduction, which greatly reduces the consumption of production base resources and improves storage efficiency.

With respect to logistics, we have established a transportation management system (TMS) for logistics to realise centralised coordination of the national-wide distribution work. We collect and integrate logistics data with digital technology, carry out intelligent management in transportation orders and vehicle arrangement, so as to improve waybill tracking and logistics efficiency. We replan localised logistics routes and take the optimisation of transportation routes and volume into account to reduce the overlap of transportation routes, while increasing the loading rate and reducing empty load. And we also broke strong subordination of the Regional Distribution Centre (RDC) to the customer to shorten the delivery distance, that is, we advocate delivery from the RDC closer to the customers. For example, after Nanjing customers move to Wuhu for production, we will arrange Suzhou RDC to make delivery. Besides, Hengan focuses on convective transport to reduce empty routes, emissions and costs. In this regard, we beef up the cooperation with third-party logistics companies on convective transport.

Using renewable energy

We take the initiative to explore the use of clean energy, and promote PV projects in plants and warehouses. We use new energy vehicles and also encourage logistics suppliers to use green energy.

We have implemented fully-covered solar rooftop in plants across the country, with PV system installed in multiple companies including Hengan (China) Paper Co., Ltd., Hengan (Wuhu) Paper Co., Ltd., Hengan (Shaanxi) Paper Co., Ltd. and Hengan (Henan) Paper Co., Ltd. By the end of 2022, 9 production companies have started the PV project, with an installed capacity of 21.4 MW and annual power generation capacity of 21.6 million kWh, equivalent to a reduction of 14,963 tonnes of carbon dioxide.

To make our warehouse go green, we install and expand solar PV on warehouse roofs. The diesel forklifts and shuttles used for warehousing operation of the Group have been fully replaced by electric vehicles, realising 100% energy transformation from diesel to electricity and reducing environmental pollution from the source. We also encourage logistics suppliers to adopt lightweight vehicles or new energy ones to reduce energy consumption.

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Delivering concept of environmental protection

We integrate sustainable development and climate change strategies into the Group's brand strategy. While promoting and enhancing our brand strengths, we expand the low-carbon ecological circle and be together with the consumers to create higher low-carbon benefits together.

The Group is committed to convey the concept of sustainable development to the masses by brand influence through green publicity and marketing integrated with the environmental-friendly character of the products. For example, Bamboo π, as one of the Group's sustainable products, adopts bamboo as the raw material, as its growth cycle is short and its powerful carbon sequestration capacity allows it to absorb large amounts of CO_2, thus protecting forest resources in a more efficient way. On the occasion of publicising Bamboo π, the Group officially announced the strategic cooperation with the Qinling Giant Panda Breeding and Research Centre. The Group adopted two giant pandas for life, named "Hengheng" and "An'an", to convey the concept of low carbon and environmental protection to consumers, appealing to the public to protect the natural ecology and pay attention to climate issues.

On various environmental protection days, Hengan influences and guides customer behaviours through brand influence, calls on the public to pay attention to major environmental challenges and hotspots, and advocate green consumption and life, so as to motivate the potential societal decarbonisation strength while raising the profile and reputation.

2.3 Scenario analysis

With the increasingly significant impact of climate change on economy development, it is of growing significance for enterprises to strengthen prevention of climate risks. To carry out prospective analysis of the climate risks facing the Group, Hengan conducts qualitative assessment of the potential impact of substantive climate transition risks and physical risks on the Group's business through simulating climate scenarios and pathways based on GHG emissions and other factors, applying the Representative Concentration Pathways (RCPs) introduced by IPCC.

Risk identification	Identify climate-related risks of Hengan based on policies, industry trends, and stakeholder concerns
Risk priority	Assess various climate-related risks based on industry dynamics and Hengan's business characteristics, and then prioritise risks for scenario analysis
Framework building	Determine two scenarios, and then build analysis framework, which includes scenario description and detailed rules for analysis
Scenario analysis	Obtain climate-related data of Hengan for scenario analysis, and communicate the analysis result with internal stakeholders

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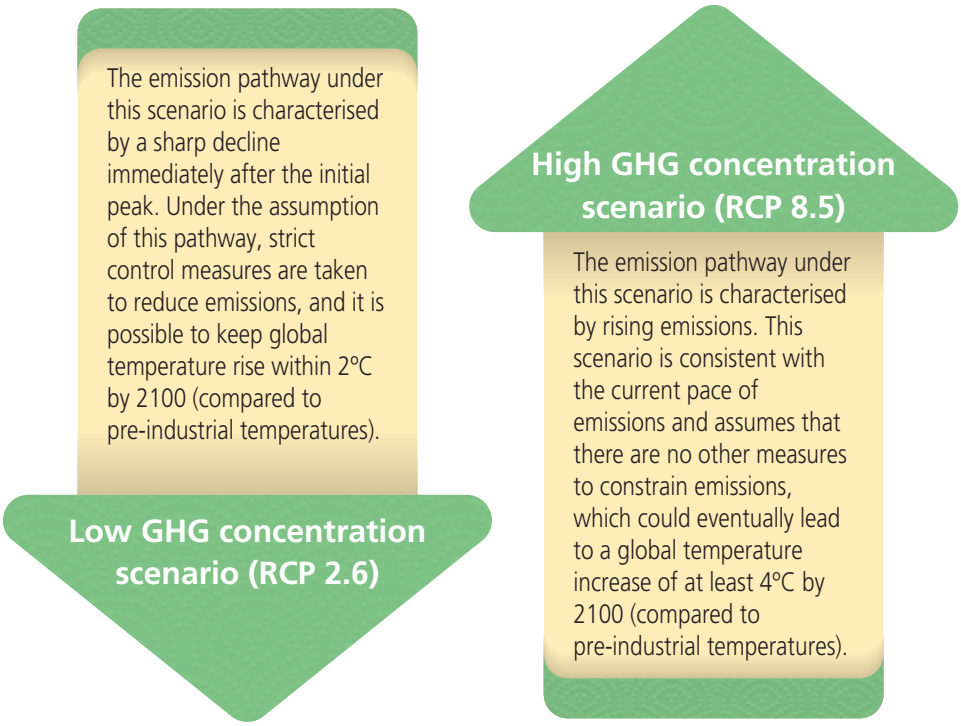
We identify two scenarios of low and high GHG concentrations, representing an increase of 2°C and 4°C in global temperature respectively over pre-industrial levels, which define the transition period in which risks are driven by variables such as government and market effectiveness, and determine the relative severity of long-term risk impacts based on the extent to which variable transformation drives the transition to a low-carbon economy. In the low GHG concentration scenario, we analyse transition risks, while the analysis of physical risks is conducted simultaneously in the low and high GHG concentration scenarios.



The Low GHG concentration scenario (RCP 2.6) is likely to result in higher transition risks due to the challenge of rapid and substantial reduction in GHG emissions, which involves changes in policies, legal environment and market, sharp rise in carbon pricing, large-scale technology upgrading and replacement, and reputation risks. With the success of the transition, physical risks will remain at a similar level to the current situation and moderate over time.

The opposite is true for the High GHG concentration scenario (RCP 8.5), where transition risk is low due to the absence of effective government and market interventions to reduce carbon emissions. However, unlike the Low GHG concentration scenario, the physical risks herein such as rise in mean temperature, rise in sea level, water scarcity, and frequent extreme weather will rise sharply with the end of the transition period, directly destroying supply chain deployment, manufacturing process and normal life of the public, threatening market stability and consumer product purchasing power.

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Scenario analysis reveals transition and physical risks with various degrees under different climate conditions, while we have already been equipped with certain climate resilience to face the challenge. Our manufacturing bases are distributed in different areas, which can effectively reduce the negative impact on overall operation and financial performance by regional extreme weather events. Also, our distribution of storage and logistic can enable the supply chain to resist all kinds of risks. We improve low-carbon transformation plan of the entire value chain step by step, from upstream suppliers, suppliers, our own operation, storage and logistic to consumers, with joint forces and multiple actions at the same time, continue to reduce our operation's impact on environment and climate, improve our resilience against climate risks. Through scenario analysis, we believe it is critical to take effective policy actions to limit rise in global temperature to well below 2°C and carbon pricing is the most possible policy action to have an impact in the short to medium term. Under this guidance, we have actively implemented relevant strategies, participated in pilot projects in the carbon trading market to deal in carbon emission permits, striving to promote enterprise resilience and mitigate the short-, medium- and long-term impacts of climate change.

Hengan will continue to monitor short-, medium- and long-term data related to climate change for deepening analysis to obtain more concrete results, thus providing guidance for subsequent strategic adjustments.

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3. RISK MANAGEMENT

We must take appropriate actions to manage climate risks, in order to reduce potential negative impacts of climate change on the level of enterprise operation. The Group's Board of Directors acknowledges the overall responsibility for designing and implementing the risk management system. Under its supervision, the management has established an on-going procedures to identify, assess and manage significant risks faced by the Group. The Group has developed a risk management framework to identify, assess and determine the Group's material risks:

Each business unit is responsible for identifying, assessing and managing risks within its business, ensuring that appropriate internal monitoring has been implemented for effective risk management, identifying and assessing principal risks during the annual business planning process with action plans to manage such risks.

The management is responsible for overseeing the Group's risk management and internal monitoring activities and holding regular meetings with each business unit to ensure that principal risks are under proper management and new or changing risks are identified .

The Board of Directors is responsible for reviewing and approving the effectiveness and adequacy of the Group's risk management and internal monitoring, and reviewing the annual internal audit report and considering the recommendations of the Audit Committee.

After risk identification according to the TCFD recommendation framework, Hengan has upgraded the current existing risk management framework by adding climate risk factors, combined with the analysis of climate risks and financial risks including market risks, credit risks, and liquidity risks, to form a more comprehensive and complete management strategy in response to the impact of relevant risks on the Group's finance and reputation. The related measures will be contained in the comprehensive business operation strategy, to promote climate resilience, as well as the speed and effectiveness that enterprise responds to climate change.

Hengan has also strived to create a positive atmosphere against climate risks by integrating ESG and climate change management concept with the communication with stakeholders, exchanging consideration of relating climate risks, encouraging stakeholders to assist Hengan in promoting climate risk management, to realize the carbon-reduction goal at last.

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4. METRICS AND TARGETS

The Group has always fulfilled its green commitment to the earth's ecological environment by improving the efficiency of natural resources and energy utilisation. Since 2020, the Group has set and announced quantitative environmental targets for the Hengan papermaking segment to reduce the density of electricity consumption per tonne of paper, with the target progress monitored and reviewed on an annual basis. Based on Hengan's climate-related strategy and TCFD recommendations, we have established a climate risk-related metric system and continuously improved the mechanism for collection, calculation and disclosure of enterprise greenhouse gas emission data to track the progress and effectiveness of our climate action:

› Organisational boundary of GHG Emissions calculation

The calculation scope of greenhouse gas emissions of the Group covers 23 production companies (27 production bases) and Weifang Hengan Thermal Power Co., Ltd.

› Calculation method for GHG

The GHG emissions are measured by carbon dioxide equivalent according to the *Guidelines for the Calculation and Reporting of Greenhouse Gas Emissions from Paper and Paper Products Manufacturers (Trial)* (《造紙和紙製品生產企業溫室氣體排放核算方法與報告指南(試行)》) issued by the National Development and Reform Commission. Scope 1 emissions are direct GHG emissions associated with anthracite and natural gas consumed in the production. Scope 2 emissions are indirect emissions that occur through the use of purchased electricity, steam and heat by Hengan.

› Metrics and targets

Since the energy and water consumption in paper production sectors accounts for a large proportion in total energy and water consumption of the Group, the Group has set up the targets for the electricity and water consumption in paper production sectors in 2023, i.e., the intensity of power consumption does not exceed 630 kWh per tonne of paper and the intensity of water consumption remains at the level of 5–6 tonnes per tonne of paper. Due to the rapid increase in production in 2022, the GHG emissions is relatively higher than that in 2021. While the GHG emissions intensity per tonne of paper, energy consumption intensity per tonne of paper and power consumption intensity per tonne of paper are lower than those in 2021, which are 25% lower than the advanced value requirement of the *Energy Consumption Per Unit Product of Pulp and Papermaking* (《製漿造紙單位產品能源消耗限額》) (GB 31825–2015). Though the water consumption intensity per tonne of paper is higher than that in 2021, it is still 81.2% lower than the national standard upper limit of water withdrawal per tonne of product specified in *Water Quotas Part 5: Paper Products* (《取水定額第5部分：造紙產品》) (GB/T 18916.5–2012).

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Boundary	Metrics	2022	2021	2020	Unit
The Group	Direct emissions (Scope 1)	**581,532**	547,925	795,184	tCO_2e
	Energy indirect emissions (Scope 2)	**934,270**	804,328	811,868	tCO_2e
	Total GHG emissions	**1,515,802**	1,352,253	1,607,051	tCO_2e
	GHG emission intensity	**0.67**	0.65	0.69	tCO_2e/revenue in RMB10,000
Paper production sectors	GHG emission intensity per tonne of paper	**0.99**	1.00	1.19	tCO_2e/tonne of paper
	Energy consumption intensity per tonne of paper	**0.31**	0.32	0.37	tce/tonne of paper
	Electricity consumption intensity per tonne of paper	**631**	640	779	kWh/tonne of paper
	Water consumption intensity per tonne of paper	**5.6**	5.2	6.1	tonnes/tonne of paper