



北京控股有限公司
BEIJING ENTERPRISES HOLDINGS LIMITED

2023

CLIMATE ACTION PROGRESS REPORT



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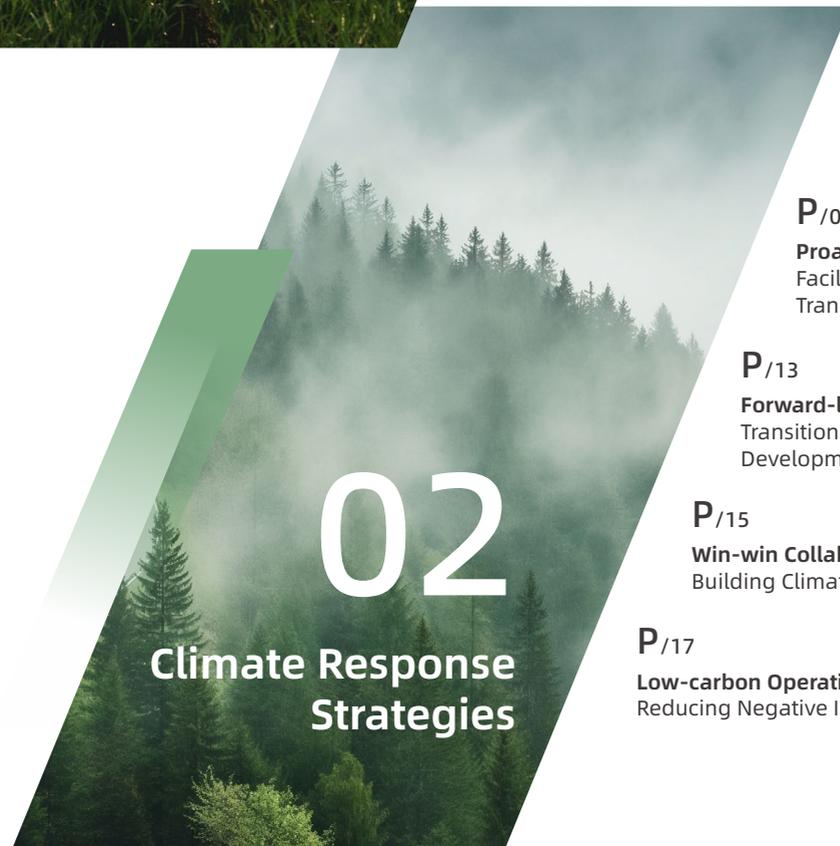
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About This Report

This report is the first climate action progress report released by Beijing Enterprises Holdings Limited (BEHL, 0392.HK). It serves to demonstrate BEHL's strategies, management, and practices related to addressing climate change. BEHL's Board of Directors guarantees that there are no false records, misleading statements, or material omissions in the Report and assumes individual and joint responsibility for the truthfulness, accuracy, and completeness of its contents.

BEHL supports global climate actions. This progress report primarily presents its climate assessment work with Beijing Gas Group Co., Ltd. (Beijing Gas) as the pilot. It also comprehensively discloses BEHL's climate-related risk management and responses in four areas: climate governance, climate response strategies, climate risk management, and metrics and targets. Moving forward, we will continue with climate risk assessments for each business segment, on track to cover the headquarters of BEHL and all its subsidiaries.

All the data and information disclosed in the Report are from official documents and internal statistical systems of BEHL, covering the BEHL headquarters and its subsidiaries in the four business segments of gas, water, environment and beer. The content related to Beijing Gas in the Report covers its three business segments: city gas, LNG and integrated energy, with boundaries consistent with those of the consolidated financial statements.

For the convenience of expression and reading, in the Report Beijing Enterprises Holdings Limited is hereinafter referred to "the Company", and the Company and its subsidiaries are hereinafter referred to as "BEHL" or "we". Names of the subsidiaries are as follows:

Beijing Gas: Beijing Gas Group Co., Ltd.

EEW GmbH: EEW Energy from Waste GmbH

BE Water: Beijing Enterprises Water Group Limited

Yanjing Brewery: Beijing Yanjing Brewery Co., Ltd.

The Solid Waste Treatment Platform: short for the solid waste treatment business management platform (an integration of Beijing Enterprises Environment Group Limited and Beijing Enterprises Holdings Environment Technology Co., Ltd.)

The Report has been prepared in line with the International Sustainability Standards Board (ISSB) *Climate-related Disclosures* (IFRS S2) framework, the *GHG Protocol Corporate Accounting and Reporting Standard*, and the *Environmental, Social and Governance Reporting Guide to the Main Board Listing Rules of the Stock Exchange of Hong Kong Limited*.

This Report contains certain forward-looking information and statements of opinion, including but not limited to underlying assumptions, preconditions, greenhouse gas (GHG) emission targets, climate change risk assessment ratings, financial estimates of energy conservation and emission reduction measures, and action plans for addressing climate change risks. Due to the potential impact of external variables, the actual development of events or trends mentioned in this Report may differ from the predictions made herein. The financial data shown in the report is presented in RMB (yuan).

The Report is published in Chinese and English and is available in print and electronic formats. It can be viewed or downloaded on the website of BEHL (<http://www.behl.com.hk>).

Message to Stakeholders

In November 2023, the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change¹ was held, dedicated to defining the future trajectory of climate action and addressing climate challenges. It is indisputable that tackling climate change has become a global challenge. China, as the world's largest developing country, prioritizes the battle against climate change and has pledged to the international community to be a major player in global climate action and achieve carbon peaking by 2030 and carbon neutrality by 2060. Against this backdrop, energy transition has emerged as the top priority and a key objective. Chinese enterprises are taking concrete actions to drive this shift and playing a vital role in global climate action.

As a responsible public utility enterprise, we position ourselves as a pivotal force in the energy transition. Our businesses in natural gas and solid waste treatment, which are inherently eco-friendly and conducive to energy transition, not only make for a cleaner and more sustainable energy mix, but also substantially cut GHG emissions. This carries great significance to fostering a circular economy and mitigating climate impact. One of our subsidiaries, Beijing Gas, has embraced comprehensive strategies to elevate the role of natural gas in the energy transition and extended its industrial chain. By boosting efficiency across the whole industrial chain, Beijing Gas has developed “smart gas” solutions, devoted to creating a clean and efficient energy supply chain. BEHL's environmental segment has been scaling up its waste-to-energy initiatives and harmonizing environmental conservation with economic benefits.

We keep up with the times, capitalize on opportunities presented by the energy transition, and stay committed to green, high-quality, and sustainable development. We diversify new energy businesses and delve into sectors that hold extensive market potential and broad prospects for application, such as photovoltaics/solar power, wind power, energy storage, integrated energy supply for heating/cooling, and hydrogen energy. Focusing on the deep integration of industry, academia, and research, we have evolved from isolated corporate green innovation to coordinated innovation across the industrial chain. In our quest for faster energy transition, we work with government bodies, research institutions, and partners to deploy low-carbon technologies and research findings and contribute to environmental protection.

Meanwhile, we recognize that while climate change opens up unprecedented opportunities to go green, it impacts our business operations and financial health. Several business segments of BEHL are navigating through climate-induced risks and influencing factors. For instance, physical climate risks may impose pressure on the assets and supply chains of our business segments to various degrees. Therefore, we have set scientific carbon reduction targets tailored to the operational characteristics of each segment. We have chosen Beijing Gas as a pilot enterprise and initiated specific climate change initiatives to explore paths to efficient emission reduction, thereby addressing the risks and challenges of climate change. In addition, we plan to incorporate climate assessment work into all business segments as an important factor for their business planning and risk management to fortify our strategic resilience against climate change.

It takes long-term planning and swift action to advance green transition and achieve net-zero emissions. We are fully aware that the journey towards transition is long and fraught with obstacles. Smooth progress relies on the support and cooperation of the country, government, employees, partners, and other stakeholders. We are committed to maintaining long-term communication and exchanges with all stakeholders to ensure that they are timely informed of our transition process and reality, engage them in the process, and share the joy of achieving our goals.

Looking ahead, we are poised to leverage the green transition and accelerate the optimization of our business presence and the adjustment of our energy mix. Along with all stakeholders united with us by a shared mission, we will inject lasting momentum into BEHL's green and high-quality development. I stand by my conviction that, through collective efforts, BEHL will carve a new chapter in energy transition and make a substantial contribution to China's carbon peaking and neutrality endeavors.

Chairman of the Board
Mr. YANG Zhichang

¹ COP28, <https://www.un.org/climatechange/cop28>

Progresses

Governance

- BEHL established a climate change governance structure and publicly released the *Policy of Climate Change Response*; it has made thorough arrangements of climate assessment and response for all its business segments and monitored their actual performance.
- All business segments have established or are in the process of establishing their climate change management system to facilitate implementation of climate response measures.



Risk Management

- BEHL has clarified the methodology for assessing climate-related risks and opportunities and developed relevant assessment models and tools.
- BEHL has completed a pilot climate risk assessment for Beijing Gas, one of its subsidiaries, and established a climate risk management process.

Physical risks

- Assessment models for four acute physical risks, namely extreme heat, extreme cold, extreme precipitation, and typhoons, have been developed, which conduct quantitative analysis on multiple dimensions, including likelihood, impact, and adaptation;
- Systemic assessments of two chronic physical risks, namely sea level rise and global warming, have been completed.

Transition risks and opportunities

- BEHL has completed assessments of seven material transition risks, including transition to a low-carbon energy mix, increased pricing of GHG emissions, methane emission control, and three major climate-related opportunities, such as developing new energy businesses. The assessment covered such dimensions as likelihood and impact and produced a risk matrix and ranking;
- For material transition risks/opportunities, BEHL has conducted adaptation analyses, sorted out existing response measures, and formulated next steps.



Strategies

BEHL has come up with a four-pronged climate response strategy, with progresses already achieved on each dimension:

Proactive strides

BEHL proactively aligns itself with the national climate change adaptation strategy and planning, serves China's 14th Five-Year Plan, and contributes to China's green energy transition;

Forward-looking planning

BEHL keeps up with new trends and focuses on the development of strategic emerging industries, relentlessly pursuing green, high-quality and sustainable development;

Win-win collaboration

BEHL actively engages in R&D innovation and industry exchanges, and contributes its own wisdom to promote coordinated carbon reduction efforts along the entire industrial chain across multiple industries;

Low-carbon operations

BEHL implements concrete and effective energy conservation, emission reduction, and pollution prevention measures to reduce the environmental impact of its operations and support the industry's zero-carbon endeavors.



Metrics and Targets

BEHL carbon target Carbon peaking by 2030

Beijing Gas methane emission targets

By 2025, methane emission intensity will be kept

below **0.12%**

By 2030, methane emission intensity will be reduced to

near zero



Beijing Gas has established climate-related metrics, covering natural gas sales in city gas business, LNG sales, hydrogen production scale, heat source development scale, scale of power generation with new energy, GHG emissions, and carbon trading compliance costs.



01

Climate Governance

BEHL believes that an efficient governance system is the cornerstone of its climate response efforts. We have established a top-down climate governance structure and formulated relevant policies and systems to comprehensively guide and supervise climate response matters across the board at BEHL.

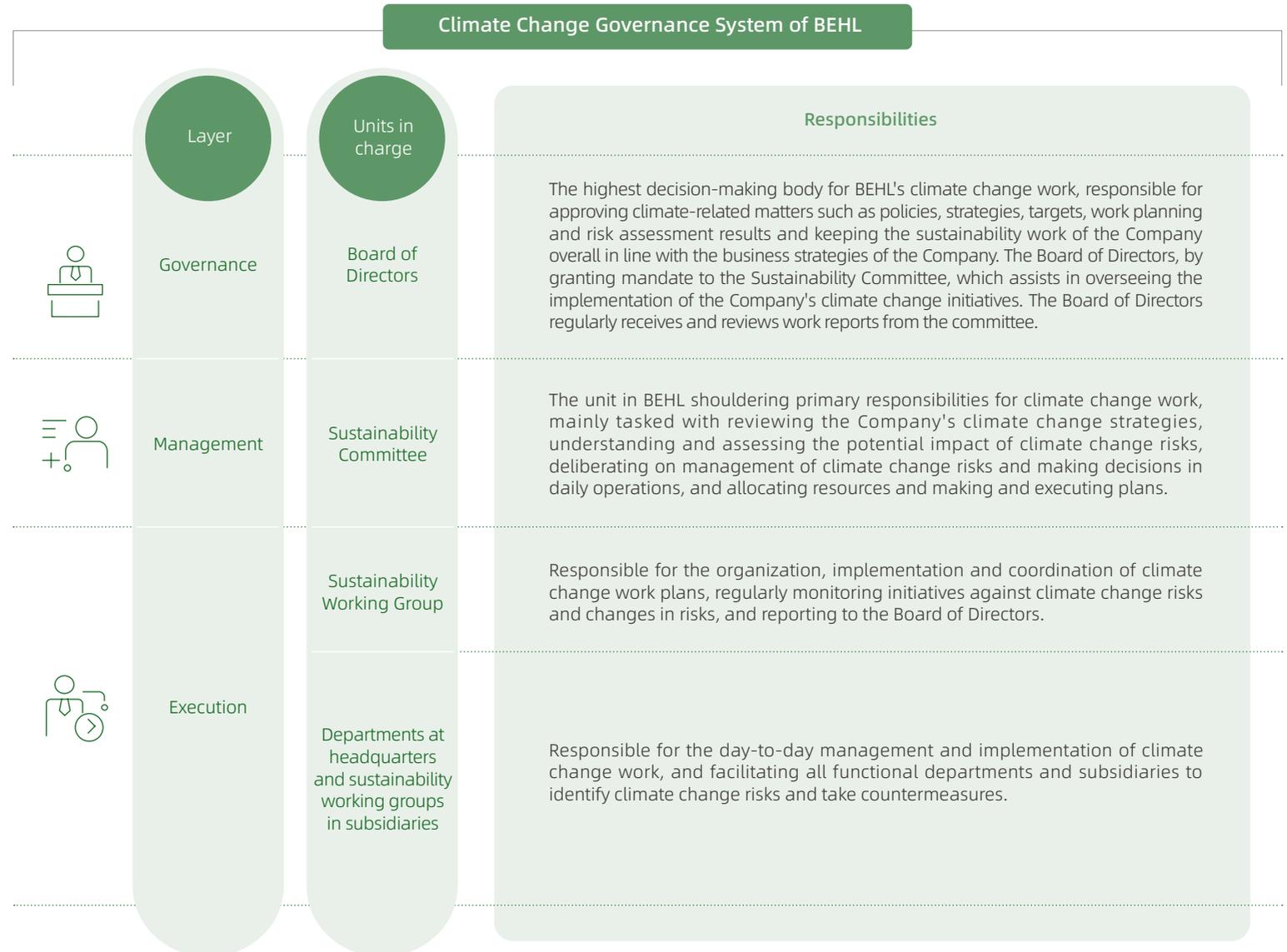
The management of climate-related risks and opportunities is under the purview of Board of Directors of the Company, which has been designated as the highest decision-making body for climate change governance. On top of that, the Sustainability Committee was established to supervise and review the Company's climate risk management. Thus, BEHL has put in place a three-tiered "governance-management-execution" climate change governance structure.

Moreover, the Company has formulated the *Policy of Climate Change Response*, which stated its commitments on three dimensions: mitigation², adaptation³, and adaptive capacity⁴. This policy demands compliance by BEHL headquarters and its subsidiaries to jointly press ahead with climate response. We are fully aware of the urgency of climate action. As our understanding of climate change risks deepens, we continuously improve our climate change governance structure and clarify and assign climate change responsibilities to more subsidiaries. The subsidiaries of BEHL have been very cooperative, devising climate governance structures based on their own characteristics and gradually carrying out the climate change response work.

² Mitigation: A human intervention to reduce emissions or enhance the sinks of greenhouse gases. IPCC, https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_AnnexI.pdf.

³ Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects. IPCC, https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_AnnexI.pdf.

⁴ Adaptive capacity: The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences. IPCC, https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_AnnexI.pdf.





02

Climate Response Strategies

BEHL has always been pursuing green development. In line with its actual circumstances, it has formulated a climate response strategy featuring "proactive strides, forward-looking planning, win-win collaboration and low-carbon operations", which will serve China's carbon peaking and carbon neutrality initiatives and promote the sustainable development of BEHL.

Proactive Strides: Facilitating the Energy Transition

The rapid development of industrialization and urbanization drives the global energy demand to keep growing. Currently, global power generation relies heavily on traditional fossil fuels, whose combustion generates large amounts of carbon dioxide and other pollutants, causing significant negative impacts on the ecology, environment and human health. It also leads to global warming, which triggers a series of climate issues, such as increased frequency of extreme weather events and rising sea levels. Against this backdrop, decarbonization of the power sector has become even more crucial as an important part of the energy transition.

Power sector decarbonization is not only an inevitable pathway towards energy transition but also an effective solution to current global energy and environmental issues. Decarbonizing the power sector means increasing the share of clean energy sources in power generation to reduce or even eliminate carbon emissions during the process, achieving low-carbon or carbon-free electricity generation.

Both natural gas-fired power generation and waste-to-energy play important roles in decarbonizing the power sector:

Natural gas is a relatively clean fossil fuel. Primarily composed of methane, natural gas produces less carbon dioxide and other harmful substances during combustion than coal and petroleum. That is why it is considered a transitional energy source that bridges the transition from fossil fuel to renewable energy.

Waste-to-energy enables the reduction, recycling and harmless treatment of waste, which not only effectively solves the problem of solid waste treatment, but also provides renewable power resources. It plays an important role in environmental protection and the optimization of energy structure.

In an era of changing global energy mix, the transition from traditional fossil fuels to clean energy has become an irreversible trend. Conscious of the heavy responsibilities of enterprises in propelling this energy transition, BEHL feels duty-bound to answer the call and play its role in this energy revolution. We are promoting the application of clean energy such as natural gas, expanding the waste-to-energy scale, and speeding up our business upgrading, contributing our share to cleaner and more efficient energy utilization.



Extending the natural gas industrial chain and building "smart gas" to progressively expand the scale of low-carbon energy utilization

Beijing Gas, a subsidiary of BEHL, has adopted a comprehensive strategy to bring into play the role of natural gas amid the energy transition. It seeks to optimize its business strategies and increase operational efficiency, aiming to build an efficient, sustainable and low-carbon energy supply system.

Extending the natural gas industrial chain and staying committed to clean energy

To expand into areas beyond its existing operating regions and markets, Beijing Gas, guided by the strategy of "expanding outwards with the roots in Beijing; extending upstream and downstream with the focus on energy", strives to establish its presence along the entire industrial chain, including upstream resource development, midstream long-distance pipeline construction, and downstream gas application. In recent years, Beijing Gas has invested in projects such as the Shaanxi-Beijing Pipeline of PetroChina, the West-East Gas Pipeline, and the Tianjin Nangang LNG Receiving Station, and successfully secured gas projects in Tangshan, Hebei, and the Xiong'an New Area.

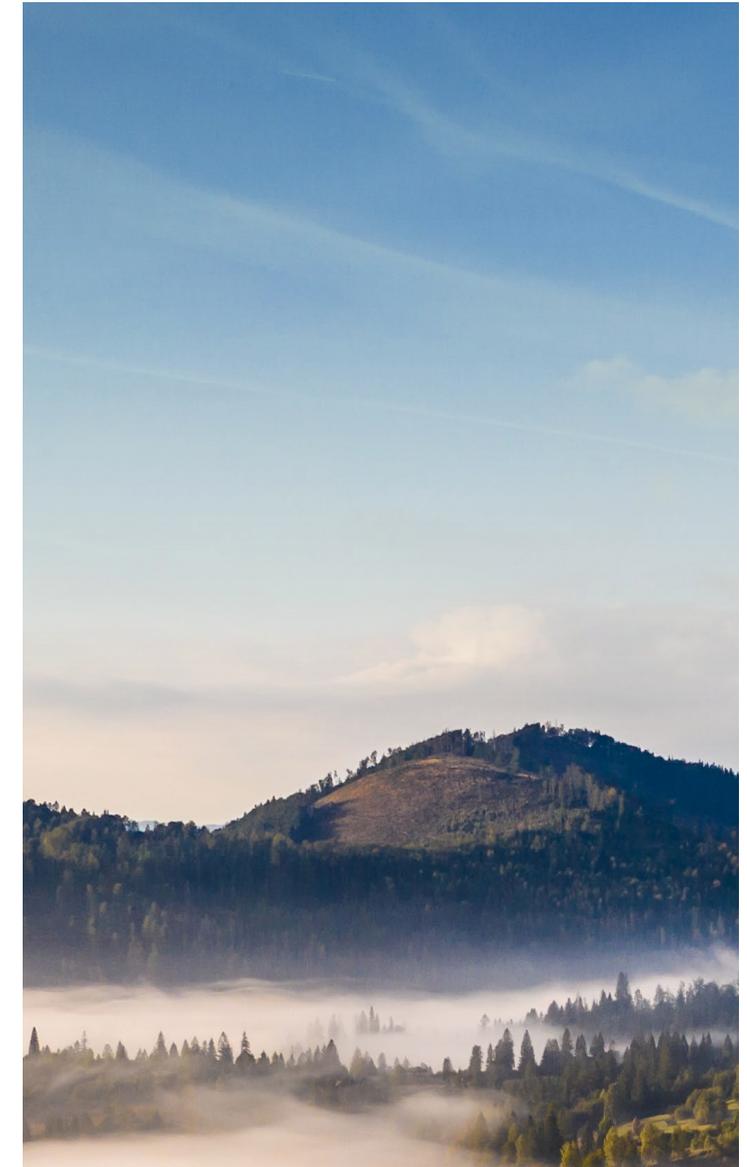
 The first phase of the Beijing Gas Tianjin Nangang LNG Emergency Reserve Project has been successfully put into operation

On September 27, 2023, with the successful docking and unloading of the first LNG vessel at the Beijing Gas LNG terminal in Tianjin Nangang, the receiving station, the first phase of storage tanks, and the natural gas outbound pipeline of the Beijing Gas Tianjin Nangang LNG Emergency Reserve Project all started to be commissioned, marking the beginning of trial operation of the first phase of the project.

The Beijing Gas Tianjin Nangang LNG receiving station has built an industrial internet platform; under the "platform + application" model, it has been carrying out digital twin development and digital scenario applications, creating a digital space matching the physical space. It deeply integrates intelligent inspection and 5G technology into the operation of the receiving station, thereby achieving the all-round sensing, prediction and early warning, and collaboration and optimization of the operation of the receiving station.



The Beijing Gas Tianjin Nangang LNG Receiving Station



Building a "smart gas" system to promote efficient and reliable development of the energy system

As China pursues high-quality economic development, it is imperative for gas companies to undergo digital transformation to enable intelligent and smart development. Beijing Gas is proceeding with the "smart gas" system development, gradually realizing smart energy management through the adoption of digital means. It has launched a smart gas platform, optimizing resource allocation and thus improving service quality and response speed by leveraging big data analysis, cloud computing, and IoT. Moreover, Beijing Gas cooperates with power companies to jointly build a digital energy management system, realizing energy interconnection and sharing.

In 2023, Beijing Gas built a production operation system that integrates and optimizes pipeline operation, production operations, equipment management, leak detection, and corrosion control, among others. It enables real-time visualized process monitoring, tracking, and quality evaluation, ensuring that the production and operation process is visible, transparent, and controllable. This way, the system achieves full business coverage, full chain control, and full element management. Beijing Gas has also launched a production operation data analysis platform that adopts the latest big data storage and analysis technologies and factors in its practical experience. By integrating and optimizing production operation business systems and establishing unified data storage and a management "cockpit", the data analysis platform enables multi-dimensional analysis from a panoramic perspective, effectively informing decision-making in production operation management.

Moreover, Beijing Gas has launched a cutting-edge digital twin-based production management platform, which is a three-dimensional(3D) digital system for natural gas stations, capable of integrated operation and maintenance monitoring. With a focus on the R&D and industrial application of generic industrial technologies, Beijing Gas is bolstering the innovative integration and application of "BeiDou + Gas" to build a complete closed-loop application system of BeiDou in the gas industry through multiple channels, in the whole space, and across the entire industrial chain. Beijing Gas has established a comprehensive detection and monitoring system for gas pipelines, aboveground stations, and underground valve chambers to fully fortify the safety network for gas usage.



Expanding waste-to-energy incineration to secure both environmental and economic gains

The Solid Waste Treatment Platform under BEHL aspires to become "a leading integrated environmental service provider in China with solid waste treatment and disposal as its core business". It continues to scale up waste-to-energy and conducts high-tech retrofitting of the incineration furnaces, significantly reducing the coal blending ratio and comprehensively improving carbon reduction benefits.

EEW GmbH, a subsidiary of BEHL, ensures the sustainable management of domestic and commercial waste that is neither reusable nor suitable for high-quality recycling. By using waste as a resource for the regional production of heat and industrial steam and for electricity generation at national level, achieves a win-win situation for both environmental and economic benefits. At the same time, EEW GmbH converts the energy from waste into process steam, electricity and district heating, thus replacing the use of fossil fuels such as oil and gas, and then reduced carbon footprint.

As of December 31, 2023, BEHL's waste-to-energy capacity reached

34,232 tonnes/day

The Solid Waste Treatment Platform under BEHL:

number of waste-to-energy plants operated in China

17

number of Chinese cities covered

14

EEW GmbH under BEHL:

number of waste-to-energy plants operated in Germany

17

number of German cities covered

15

number of cities covered in Luxembourg and the Netherlands respectively

1

The market share measured by technical plant capacity that makes EEW GmbH the market leader in Germany

16%

The market share of EEW GmbH as the only energy-from-waste plant in Luxembourg

100%

The market share of EEW GmbH in the Netherlands

6%

Forward-looking Planning: Transitioning towards Green Development

Energy transition is a climate-related opportunity for BEHL. Aware of the critical role that the new energy industry plays in meeting climate-related goals, BEHL has incorporated the concept of low-carbon development into the entire process of corporate production and operation. Pursuing green transformations and upgrading, it seizes opportunities to engage in diversified new energy businesses.

As a relatively clean fossil fuel, natural gas, coupled with new energy, represents an important direction to follow for future power and heating systems. Setting sights on emerging low-carbon business, Beijing Gas is gradually shifting from a "gas-focused" to an "energy-focused" strategy. The emphasis is placed on sectors with promising application prospects, such as renewable energy power generation (photovoltaics, wind power), energy storage, integrated-energy heating (cooling), and hydrogen energy, aiming to steer Beijing Gas towards green, innovative and sustainable growth.

Industrial Characteristics and Future Directions



Power generation with renewable energy

The large-scale development of renewable energy in China has brought about huge technological progresses, fast drop in costs and rapid improvements in cost-effectiveness, especially for wind power and photovoltaics. Thus, power generation with renewable energy, in particular wind and solar power, is becoming the mainstream to satisfy new energy demand globally at a faster pace. Moving forward, Beijing Gas will make forays into power generation with renewable energy. It will start with distributed photovoltaic projects and then build on that and promote the construction of centralized photovoltaic power generation and wind power generation in the Beijing-Tianjin-Hebei region and surrounding areas, realizing wind-photovoltaic complementarity and coordinated development.



Energy storage

With the ever-rising proportion of power generation with renewable energy such as wind and photovoltaics, conventional regulation capabilities come short, and new forms of energy storage are needed for regulation purposes. Electrical energy storage will become an important form of energy storage in a high proportion of clean energy systems. Moving forward, Beijing Gas will tap into the base of customers it has and prioritize the development of independent energy storage businesses on the user side with electrochemical energy storage such as lithium-ion batteries; this will generate profits through peak-valley price differences and deliver more reliable electricity supply to users. In addition, Beijing Gas will gradually develop compressed-air energy storage and establish large-scale energy storage stations.



Integrated-energy heating (cooling)

Integrated energy services are defined by the integration of supply of electricity, heating, cooling, gas, and power for electrified transportation. Going forward, Beijing Gas will, in line with the development trend of new energy, expand into geothermal, photovoltaic, energy storage and other integrated-energy services. While developing new energy businesses such as photovoltaics and energy storage, Beijing Gas will tap into the renewable energy resource endowment in Beijing and the wider Beijing-Tianjin-Hebei region to actively develop the shallow and mid-deep geothermal energy therein, vigorously expanding the integrated-energy heating (cooling) market.



Hydrogen energy

Hydrogen energy is a secondary energy from a wide range of sources, clean and carbon-free, flexible and efficient, and applicable to a myriad of scenarios. Those attributes make it an ideal medium for promoting the clean and efficient utilization of traditional fossil fuels and supporting the large-scale development of renewable energy. It blazes an important trail for the global energy technological revolution. Going forward, Beijing Gas will first position itself as a vehicle hydrogen energy service provider, then go on to become a green hydrogen energy supplier, and ultimately develop itself into an integrated hydrogen energy application enterprise.

New Energy Development Progresses of Beijing Gas

| Areas of new energy | Overview of progresses | Planned/under-construction projects (partial) |
|---|--|---|
| Power generation with renewable energy | As of the end of 2023, the contracted volume of distributed photovoltaics was around 6.5 MW | <ul style="list-style-type: none"> • The rooftop PV project of Shijingshan Water Plant • The Sinovac distributed PV project • The distributed PV power generation project at Xiyue Tianjie, Fangshan District, Beijing |
| Integrated-energy heating (cooling) | According to statistics in 2023, the areas reserved for development of industrial parks and the like exceeded 13 million square meters | <ul style="list-style-type: none"> • The heating project for the residential buildings of the Beijing Garden Expo • The heating project for the resettlement housing for shantytown renovations in the Tongzhou Economic Development Zone |
| Hydrogen energy | An application for the construction of a demonstrative hydrogen refueling station has been submitted | <ul style="list-style-type: none"> • The Wangsiying Hydrogen Refilling Station • The Mafang Hydrogen Production and Refilling Integrated Station |



Beijing Gas conducted a series of research projects on hydrogen energy

From 2019 to 2023, Beijing Gas carried out a series of hydrogen research projects in such areas as integrated station of producing hydrogen from natural gas and refueling hydrogen, hydrogen-enriched natural gas, and fuel cell for distributed power. The specific projects included "Research on the Application of Hydrogen Energy in City Gas Supply", "Technical and Economic Research on Natural Gas-based Hydrogen Production and Refueling Demonstrative Stations", and "Hydrogen Energy Development Direction and Investment Strategy of Beijing Gas". Meanwhile, Beijing Gas has carried out a series of projects across the entire hydrogen energy value chain, promoting the application of hydrogen energy in transportation, construction, power, manufacturing and other sectors in Beijing.



Beijing Gas ventured into hydrogen energy utilization

Beijing Gas has made some preparations for transitioning towards hydrogen energy. In 2023, Beijing Gas's "N+1+X" hydrogen production model was recognized by experts from Beijing Municipal Government Departments and Tsinghua University, China Quality Certification Center, China Hydrogen Alliance, China Beijing Green Exchange, and Zhongguancun Hydrogen Industry Alliance. It is now proceeding as planned.

In terms of biogas purification and grid connection, Beijing Gas has worked with Beijing Environment Sanitation Engineering Group for pilot work at the Asuwei Circular Economy Park.

In terms of hydrogen refueling station and hydrogen production plant construction, the Chaoyang Wangsiying Station has been included in the first batch of hydrogen refueling station constructions in Beijing in 2023.

In terms of hydrogen blending into natural gas pipeline, Beijing Gas constructed a trial base with China University of Petroleum to address this issue. Cooperation has been carried out with Sinopec on hydrogen sources and green hydrogen pipelines to Beijing.

Win-win Collaboration: Building Climate Influence

BEHL has always viewed research as important as industrial activities and has been deeply involved in collaborative research and industrial exchanges. It strives to seize the key opportune period of green transformation and industrial upgrading to expand its climate influence. The subsidiaries of BEHL have continued to increase research spending and step up cooperation with governments, research institutes, domestic and foreign partners on the low-carbon economic transformation and energy conservation and emission reduction in natural gas businesses. They also sought more corporate partners with sophisticated experience and environmental protection technologies. This way, BEHL unleashes synergy from government-enterprise partnership and domestic and overseas interactions and taps into the momentum in the industry and across the industrial chain, creating favorable conditions for energy conservation and emission reduction in a scientific and stable manner.

Beijing Gas proactively undertakes low-carbon energy research led by the government. It has conducted in-depth research on Beijing's energy development paths against the background of carbon peaking and carbon neutrality. Its research outcomes have been recognized by government authorities and industry experts.



Beijing Gas conducted research on the pathway towards "carbon neutrality" in Beijing

After the national goals of carbon peaking and carbon neutrality were proposed, Beijing Municipality also needs to formulate policies for its own carbon neutrality. Answering the call for "carbon neutrality", Beijing Gas proactively conducted research on the pathway towards "carbon neutrality" in Beijing, contributing ideas and suggestions for the Beijing government

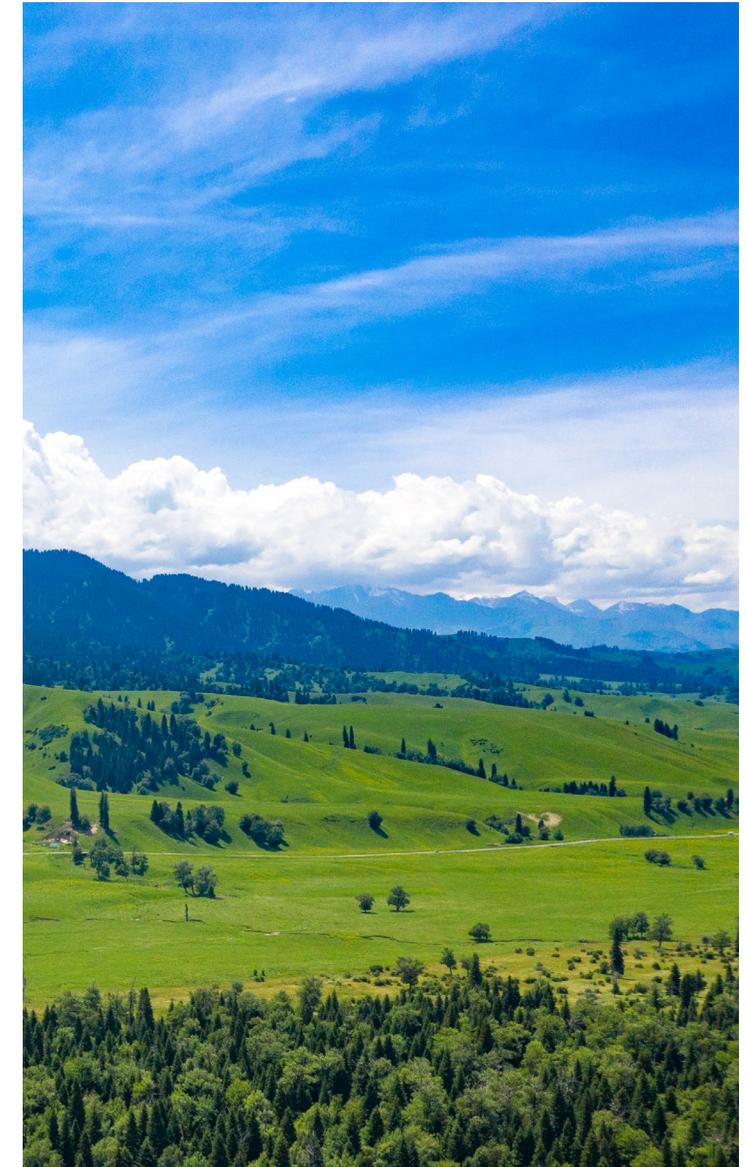
The research provided insights into the energy development pathway for Beijing by 2025, 2035, and 2050 respectively, and proposed the following:

- The local renewable resources are limited and unstable in Beijing, which warrants the coupling with stable energy sources such as natural gas as the foundation of energy security;
- Reducing the proportion of coal-fired power from outside Beijing and increasing local power generation with natural gas is the primary means to reduce carbon emissions in Beijing;
- In the long term, local carbon neutrality can be achieved by utilizing CCUS in natural gas-fired power generation and heating.



Beijing Gas conducted research with a leading hydrogen energy enterprise and a design institute

The research project "Adaptation Evaluation and Demonstrative Verification for Hydrogen-enriched Natural Gas", jointly undertaken by Beijing Gas, the SPIC Hydrogen Energy Co.Ltd., and Beijing Gas and Thermal Engineering Design Institute Co., Ltd., was accepted by the Beijing Municipal Science & Technology Commission in February 2022. Beijing Gas was mainly responsible for risk assessment of hydrogen-enriched existing natural gas. Through project implementation, the risks of hydrogen-enriched existing natural gas have been clarified, which is conducive to revitalizing existing pipeline resources, providing technical reserves for exploring zero-carbon energy transmission routes, and further assisting the transition of Beijing's gas energy business.



Beijing Gas has been keen to participate in industry events and join industry alliances and initiatives. On such occasions, it shares its own experience in emission reduction and explores emission reduction trends and pathways with peers and industrial chain partners, striving to blaze a trail of green development for the gas industry.

● Domestic and International Initiatives that Beijing Gas Joined

● June 2018

Signed the "Methane Guiding Principles" (MGP) for the global energy industry to address climate change, becoming the first oil and gas company in Asia to join the coalition.

● May 2021

Jointly established the China Oil and Gas Methane Alliance with six major domestic oil and natural gas companies to cooperate with peers across the entire industrial chain, take a series of actions to comprehensively strengthen methane emission control, and make methane monitoring and measurement systemic, regular and standardized, in line with international best practices.

● October 2021

Co-hosted the seminar "Methane Emission Reduction Promotes Carbon Neutrality in City Gas" with ENN Energy and the Beijing Office of the U.S. Environmental Defense Fund (EDF), and initiated the "Methane Control Initiative of China City Gas Enterprises", which received positive responses from ten city gas enterprises.



Beijing Gas has shared its methane emission reduction experience with international organizations such as the International Energy Agency (IEA) and the United Nations Environment Programme (UNEP) on multiple occasions. It has also engaged in regular exchanges with international organizations like EDF and MGP, participating in online and offline exchange activities, including the EDF online workshop on methane reduction across the entire industrial chain of natural gas and the MGP London Round Table Conference.



Beijing Gas actively engages in industry exchanges through the MGP platform

In 2018, Beijing Gas became the only downstream company representative from Asia to join the MGP during the World Gas Conference in Washington. Committed to methane control and reduction of the industry, Beijing Gas has since then been actively involved in organizing and participating in roundtable meetings, regular sessions, and other activities within MGP, learning from best practices in the industry and sharing with peers its own managerial expertise and technical know-how. Moreover, Beijing Gas has advocated for methane reduction within the industry, facilitating peer companies to join the MGP.



Beijing Gas participated in the 28th World Gas Conference, and then Chairperson took office as President of the International Gas Union

In May 2022, at the handover ceremony of the Presidency of the International Gas Union (IGU) held during the 28th World Gas Conference (WGC2022) in Daegu, South Korea, Li Yalan, then Chairperson of the Board of Beijing Gas, officially took office as President of the International Gas Union for the 2022-2025 term. Li Yalan called for promoting the decarbonization process of natural gas, achieving the green transformation through emission reduction technologies such as methane recovery and utilization and CCUS. She emphasized the need to integrate digital technologies into all stages of the natural gas industrial chain, including exploration, production, transportation, and storage, and to promote the integrated development of natural gas with other gaseous energy sources, expanding the industrial chain and value chain of the natural gas industry.



Beijing Gas participated in the UNFCCC COP 28

From November 30 to December 12, 2023, the 28th Conference of the Parties (COP28) to the Framework Convention on Climate Change took place in Expo City Dubai, United Arab Emirates. Beijing Gas, through the International Gas Union, actively engaged in international affairs and contributed to global climate governance. In a side event organized by China's Ministry of Ecology and Environment dedicated to the progress of methane emission control in the country, Beijing Gas presented its outstanding practices in reducing methane emissions by developing a corrosion control technology system. The side event drew the attention of dozens of attendees and was recognized as an excellent side event at the China Pavilion.

Low-carbon Operations: Reducing Negative Impact

To speed up its green energy transition, BEHL has continuously optimized its operation model, strengthened energy and resource conservation and utilization, and vigorously promoted the concept of environmental protection, which goes a long way towards achieving green development.

In 2023, BEHL implemented a series of energy conservation and carbon reduction measures, including extensively adopting efficient equipment and technologies, improving energy efficiency, promoting the use of renewable energy, and optimizing transportation management. These measures aim to translate energy consumption ambitions and the renewable energy development blueprint into concrete actions in specific energy consumption scenarios of production and life. We have widely adopted efficient equipment and technologies to reduce energy consumption and lowered carbon emissions by optimizing operational processes. BE Water and Yanjing Brewery have continuously promoted the use of renewable energy by applying distributed photovoltaic facilities in various operational regions and generating power with renewable resources as much as possible. For more information, please refer to the *Beijing Enterprises Holdings Limited 2023 Sustainability Report*.

Beijing Gas has actively explored green technology transformation and upgrading pathways in its pursuit of green and low-carbon operations. In 2023, Beijing Gas implemented energy-conserving retrofitting of existing equipment and replaced it with more efficient equipment. These moves produced gains on multiple dimensions, including lower safety risks and higher operational efficiency, energy savings and lower operational costs. In addition, in the planning of the Tianjin Nangang LNG Emergency Reserve Project, Beijing Gas took into account the utilization of the cold energy produced during the LNG regasification process, improving energy efficiency.



Beijing Gas officially put into operation the Waste Heat Recovery Heat Pump System of Zhongguancun Yanqing Park

Beijing Gas has added a waste heat recovery heat pump system on the southern side of the gas boiler room in the Badaling section of Zhongguancun Yanqing Park and put it into operation after commissioning in November 2023. The system is able to extract and utilize the residual heat from boilers' exhaust gas. It includes a gas absorption heat pump unit, heat source water circulation pump, waste heat water circulation pump, and automatic chemical dosing device. Additionally, three direct contact flue gas heat exchangers (spray towers) have been added inside the boiler room, along with complementary electrical and automatic control systems.

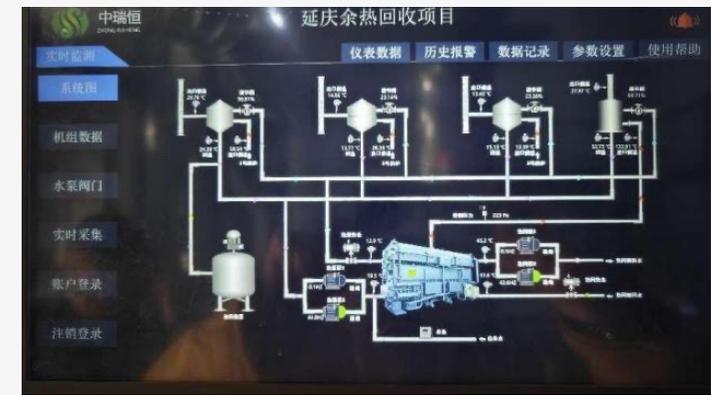
During the initial 61-day operation phase, this system reduced natural gas consumption of

453,600 m³



generated energy cost savings of

1,192,700 yuan



The waste heat recovery heat pump system at Yanqing Park, Zhongguancun

Methane is the second biggest GHG contributor to global warming. Beijing Gas views methane emission control as an important task to reduce GHG emissions and address climate change. As a major methane emitter under BEHL, Beijing Gas proactively fulfills its responsibilities in methane control. As one of the earliest downstream gas companies in China to implement methane control, it is a pioneer among city gas companies. Beijing Gas has carried out a series of methane emission reduction actions in line with its reality and continued with statistical analysis of atmospheric pollutants, primarily methane, contributing to methane emission reduction in the energy sector.

Methane Emission Reduction Initiatives



Standards research

National standards compilation

As the lead editor for the national standard *Guidelines for Greenhouse Gas Emissions Accounting and Reporting Part XX: City Gas Supply Enterprises*, a national standard that has obtained the approval to proceed with formulation and is now soliciting opinions, Beijing Gas has organized the standard compilation process in an orderly manner, filling the gap in GHG accounting and reporting standards for the city gas industry under the framework of carbon peaking and carbon neutrality.

Measurement standard research

Beijing Gas has facilitated the formulation of measurement standards. It adopted the bag sampling method to correct the methane emission rate calculation formula and established a calculation formula that factors in the unique characteristics of the city gas industry.

Practical guidelines translation

In collaboration with the US Environmental Defense Fund (EDF), Beijing Gas has translated the *Methane Guiding Principles Best Practice Guides* into Chinese, providing systematic and localized guidance for the application of the best practices in China.



Technological innovation

Beijing Gas has conducted research on pipeline corrosion control, optimization of high-precision gas detection vehicles, and the development of a series of flow-thru plugging devices to address the technical challenges of preventing, detecting, and stopping gas leaks in the city gas industry.



Pipeline corrosion control

Beijing Gas has rigorously reined in leakage incidents caused by corrosion as the root cause. To that end, it proposed a management model based on corrosion control units, and constructed a comprehensive digital corrosion control platform based on various technologies such as cathodic protection, drainage control, comprehensive detection, and risk assessment. All these efforts enable preventive management of pipelines, further reducing the risk of pipeline leaks.



Optimization of high-precision detection vehicle

With continuous, dedicated and independent R&D efforts of high sensitivity laser detection equipment, Beijing Gas has established a proprietary high-sensitivity laser detection system. In addition, it has carried out research on the domestic capabilities for the software and hardware of optical core modules and calibration algorithms, along with the development of a buried pipeline leak source tracing model and the creation of a methane leak source positioning module. These efforts can help obtain more stable data with lightweight detection equipment, and enhance the accuracy of leak source tracing.



03

Climate Risk Management

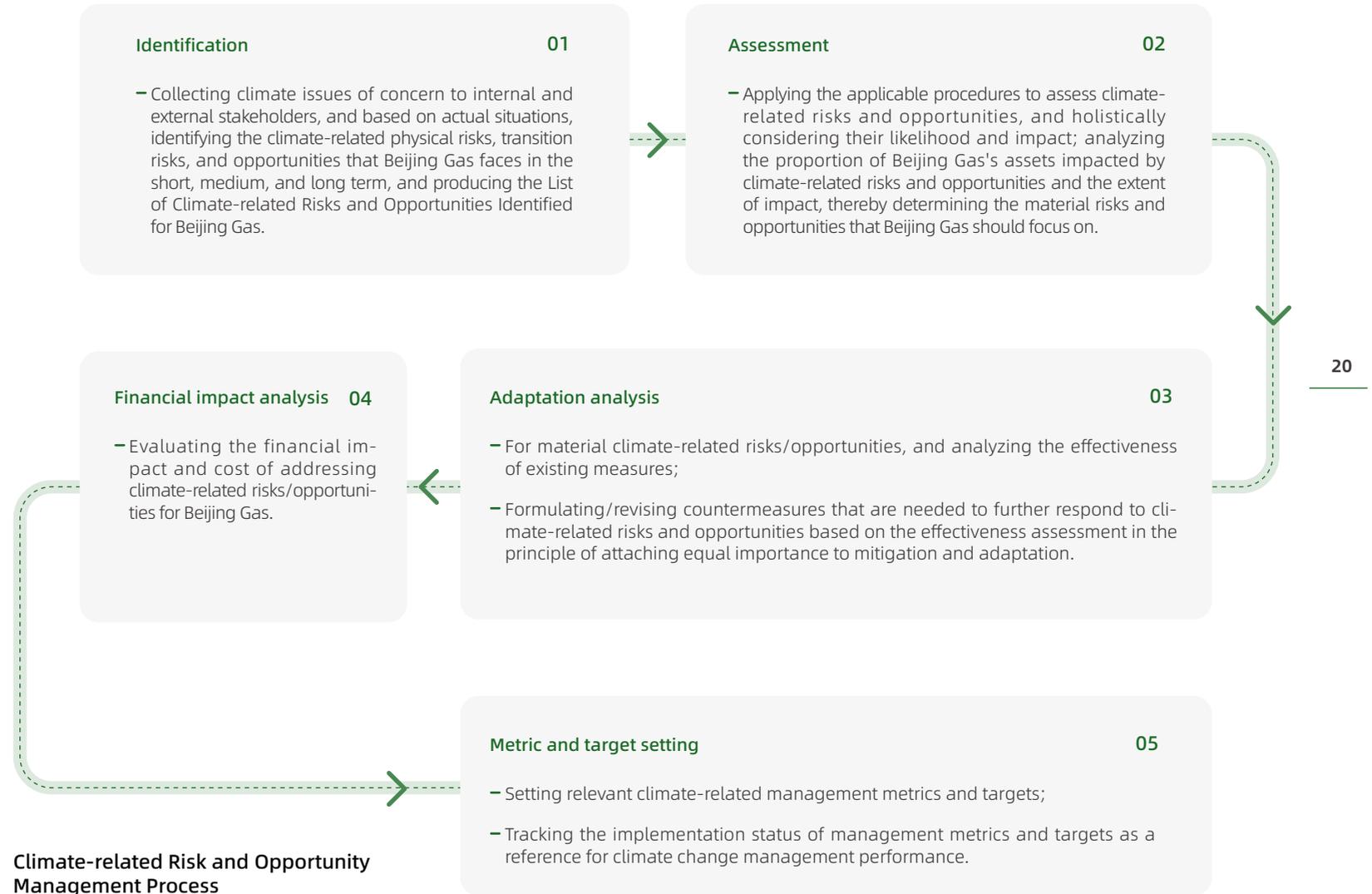
In response to climate-related risks and opportunities arising from internal and external factors, an enterprise's risk management capability is crucial. BEHL has proactively established a climate-related risk management mechanism. Subject to the unified decision-making and guidance of the Sustainability Committee, each subsidiary formulates climate-related risk management measures tailored to its business reality to ensure prompt response and mitigate or avoid the impact of climate events.

Risk Management System

Beijing Gas has formulated the *Beijing Gas Internal Control Manual* to systematically manage projects with major risks. The risk management department organizes relevant business departments to identify risks in their respective business areas. After risk identification and analysis, Beijing Gas identifies its material risks, formulates the corresponding management measures or risk control plans, and publishes the *Risk Management Report* annually, which makes predictions and lays out responses.

Beijing Gas is well aware that the impact of climate change on enterprises cannot be taken lightly. Climate change itself is a risk that can directly impact enterprises, and it can trigger other major risks through different ripple effects. Therefore, Beijing Gas has incorporated climate-related risks into its comprehensive risk management framework for review and supervision to rein in the risks.

In 2023, Beijing Gas established a climate-related risk management system, clarifying a series of specialized management measures, including management processes, assessment methodologies and response planning of climate-related risks and opportunities. By putting in place the climate-related risk management processes, Beijing Gas aims to identify and assess the risks and take targeted measures to prevent, control, and mitigate them, which will pave the way for Beijing Gas to further tighten control of the risks and properly handle them to reduce the negative impact. Moreover, Beijing Gas has clearly defined the responsibilities of relevant departments in the management process to ensure the efficient execution of annual climate-related risk and opportunity identification, assessment, and response.



Beijing Gas has set short, medium, and long-term time frames based on internal and external environments. Climate-related risks and opportunities are assessed over each of the three time spans.

short term 2023-2025

medium term 2026-2030

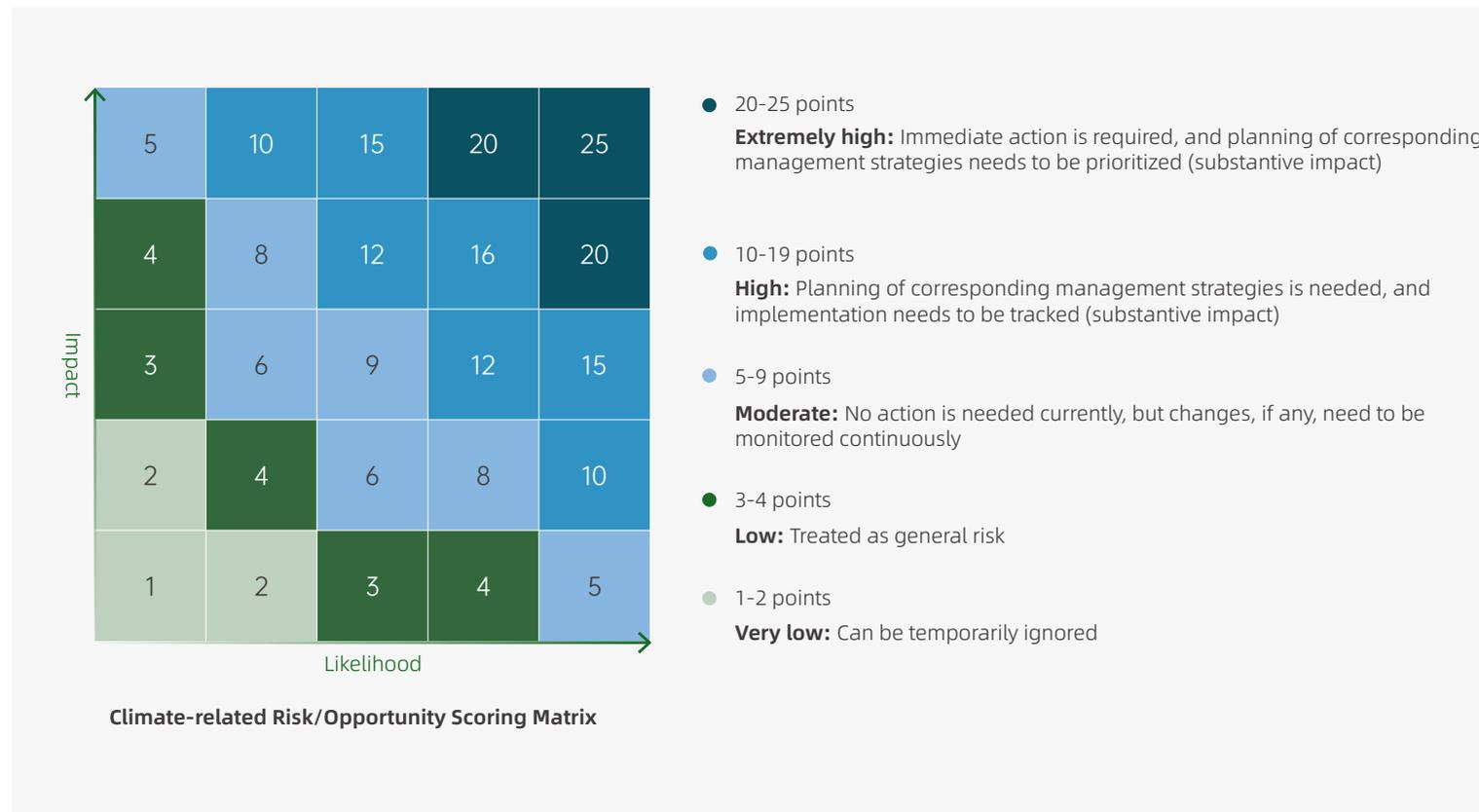
long term 2031-2050

Beijing Gas has established climate scenarios that are suitable for its own situation and conducted stress tests on its adaptive capacity to develop more prudent response strategies and plans.

| | Scenario 1 High-emission scenario | Scenario 2 Baseline-emission scenario | Scenario 3 Low-emission scenario |
|----------------------------|--|--|---|
| Public scenario references | Shared Socioeconomic Pathways (SSP) 5-8.5 proposed by the Intergovernmental Panel on Climate Change (IPCC), Stated Policies (STEPS) scenario proposed by the International Energy Agency (IEA) | Shared Socioeconomic Pathways (SSP) 2-4.5 defined by the IPCC, Announced Pledges Scenario (APS) proposed by the IEA | Shared Socioeconomic Pathways (SSP) 1-2.6 defined by the IPCC, Net Zero Emissions by 2050 Scenario (NZE) proposed by the IEA |
| Explanation | <p>In this scenario, GHG emissions increase rapidly within this century, doubling by 2050; the global average temperature rises by more than 4°C above pre-industrial levels by 2100. Greenhouse gas emissions continue unabated, so physical risks increase over time.</p> <p>This scenario assumes that countries are developing according to current policies and trajectories, and it is expected that global greenhouse gas emissions will continue to rise, and the pressure of climate change will continue to intensify.</p> | <p>In this scenario, GHG emissions peak around 2040 and then decline, with the global average temperature rising by more than 2°C above pre-industrial levels by 2100. From now to 2050, the physical risks play out in ways similar to the low-emissions scenario, but begin to moderate after the mid-century, converging towards the risk situation of the low-emissions scenario.</p> <p>This scenario assumes that all climate commitments made by governments around the world will be fulfilled, including National Independent Contributions (NDC)⁵ and long-term net zero targets.</p> | <p>Under this scenario, the global average temperature rises by around 1.5°C before 2100; the odds of physical risks occurring are relatively low.</p> <p>This scenario has achieved the ideal goal of achieving net zero carbon dioxide emissions worldwide by 2050. In this context, countries will make every effort to implement stricter climate policies, increase investment in renewable energy and clean technologies, and greenhouse gas emissions from the oil, natural gas, and coal industries will also significantly decrease.</p> |

⁵ National Independent Contributions (NDCs) are the core of the Paris Agreement and the achievement of its long-term goals, reflecting the efforts of each country to reduce emissions and adapt to the impacts of climate change.

Beijing Gas established a "likelihood-impact" matrix. It holistically analyzes the likelihood of climate-related risks and opportunities and their impact on business operations to determine their level of importance. The likelihood and impact of risks and opportunities are divided into 5 levels (scored out of 5), and the level of importance for each risk/opportunity is then determined based on the result of multiplying its scores of likelihood and impact.



After assessing risks/opportunities, Beijing Gas will rank them in order of priority. Different management procedures will be designed for risks/opportunities in the short, medium and long term respectively. Acute and severe risks will be prioritized, while chronic or minor risks will be subject to observation over the long span. Meanwhile, Beijing Gas will evaluate whether the existing risk control mechanisms and response measures are adequate for management or mitigation, and then propose subsequent response measures, if necessary.



Physical Risks

The physical risks faced by Beijing Gas include acute risks (extreme heat, extreme cold, typhoons, and extreme precipitation) and chronic risks (sea level rise, and global warming). These risks can put assets and supply chains under stress with potential financial implications. Therefore, Beijing Gas is continuously stepping up financial investment and research to carry out adaptation moves and enhance its climate adaptive capacity, becoming better-suited to respond to the intensifying risks of climate change.

Risk Impact Analysis

2023 was the hottest year on Earth since 1850⁶, with the global average temperature already rising by about 1.54 (± 0.06) degrees Celsius⁷. In 2023, Beijing Gas faced multiple physical risk events in different regions, including floods caused by extreme precipitation, extreme cold weather in winter, and extreme heat in summer. The occurrence of these events is closely related to climate change, and if it becomes more frequent and severe in the future, it has the opportunity to have a certain impact and threat to the business and development of Beijing Gas.

Beijing Gas employs various means, including physical climate risk models, to comprehensively analyze their impacts. The analysis results are as follows:

⁶ 1850 is considered the start of the Industrial Revolution. The scientific community uses the period 1850-1900 as the reference for pre-industrial global average temperature.

⁷ Source: *The Global Temperature Report for 2023 released by Berkeley Earth* <https://berkeleyearth.org/global-temperature-report-for-2023/>

Beijing Gas's Physical Risk Impact Analysis

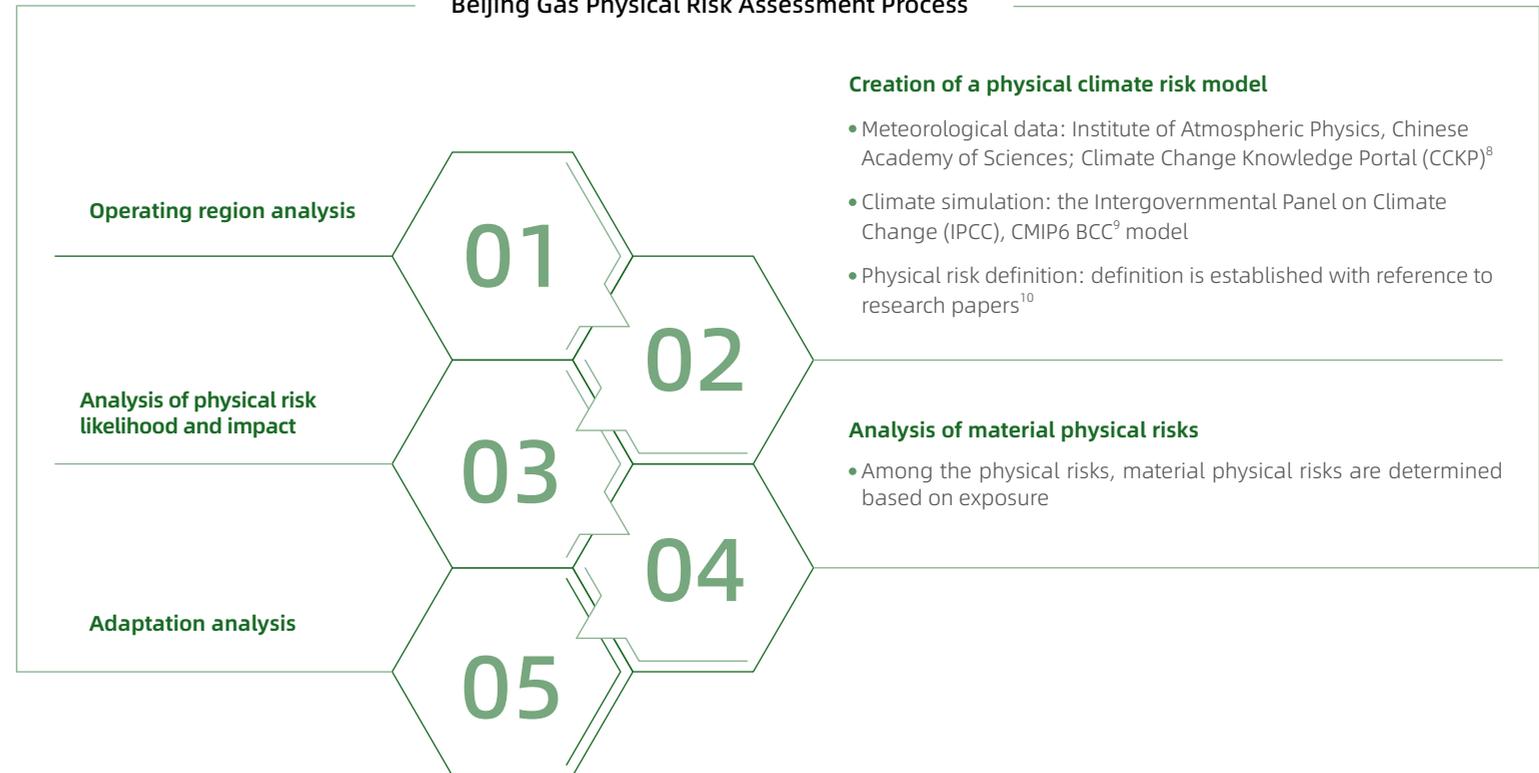
| Physical risks | Trend | Impacted operating regions | Duration of impact | Impact on Beijing Gas |
|------------------------------|---|---|---------------------------------|---|
| Extreme precipitation | Increasing risk | All operating regions | The short, medium and long term | <ul style="list-style-type: none"> Gas supply facilities, storage tanks, and regulation stations and other equipment may be flooded (a secondary disaster caused by extreme precipitation), leading to equipment failure, corrosion, and damage; Standing water around LNG receiving terminals may affect their normal operations, leading to equipment damage, power outages, and supply chain disruptions that ultimately impact LNG reception and supply; Employees are unable to safely operate and maintain equipment and exposed to greater safety risks. |
| Extreme heat | Increasing frequency of occurrence and rising temperature | All operating regions except Hainan province | The short, medium and long term | <ul style="list-style-type: none"> Increased demand for gas (for air conditioning and refrigeration, etc.) puts the gas supply system under stress, and Beijing Gas needs to increase supply capacity to meet user demand; The evaporation rate of LNG increases due to temperature changes, affecting the replenishment rate of storage facilities; Expansion and deformation of gas pipelines caused by long periods of high temperatures increase the risk of leaks and ruptures, and loosened pipe connections increase the risk of leakage; Maintenance costs for gas supply equipment and operating costs for site ventilation equipment both increase; |
| Extreme cold | Decreasing risk | All the operating regions except Hainan and Guangxi | The short, medium and long term | <ul style="list-style-type: none"> Increased demand for gas (for heating etc.) puts the gas supply system under stress, and Beijing Gas needs to increase supply capacity to meet user demand; Reduced road transportation and logistics capacity due to extreme cold impact gas supply chains and LNG transportation, increasing the risk of gas delivery delays and supply instability; Freezing and rupturing of pipelines and valves are damage to gas supply facilities, and increase safety risks for outdoor workers; Outdoor workers are exposed to greater safety risks. |
| Typhoon | Decreasing frequency of occurrence | Coastal areas such as Tianjin and Hainan | The short, medium and long term | <ul style="list-style-type: none"> Equipment damage and increased safety risks for customers, employees, and the public. |
| Sea level rise | Increasing risk | Tianjin | The long term | <ul style="list-style-type: none"> Due to rising sea levels, seawater will more easily come into contact with infrastructure at receiving terminals, such as pipelines, pump stations, and storage tanks. Corrosion by seawater can damage equipment, leading to malfunctions, leaks, and losses, increasing operational risks and asset maintenance costs for coastal operating regions of Beijing Gas. |
| Global warming | Increasing risk | All the operating regions | The short, medium and long term | <ul style="list-style-type: none"> Global warming may reduce customer gas usage and increase maintenance costs for gas supply facilities. |

Scenario Analysis – Material Risk Assessment

Beijing Gas has established a physical risk scenario analysis model combining meteorological data, climate scenario models, and GIS (geographic information system) to evaluate the physical risks facing each subsidiary. Based on different emission scenarios and variables of climate scenario models, Beijing Gas determines the likelihood and degree of impact of physical risks for each subsidiary, quantifies the data to form a risk matrix, and conducts further analysis.



Beijing Gas Physical Risk Assessment Process



⁸ The central hub for climate change-related information created by the World Bank [Home | Climate Change Knowledge Portal \(worldbank.org\)](https://www.worldbank.org/climatechange)

⁹ <https://www.wdc-climate.de/ui/cmip6?input=CMIP6.CMIP.BCC.BCC-CSM2-MR.piControl>

¹⁰ <http://www.aearth.ac.cn/CN/10.11867/j.issn.1001-8166.200710.1066>

Beijing Gas's Exposure to Physical Risks¹¹

| Types of physical risks | Low-emission scenario | | | Baseline-emission scenario | | | High-emission scenario | | |
|-------------------------|-----------------------|-------------|-----------|----------------------------|-------------|-----------|------------------------|-------------|-----------|
| | Short term | Medium term | Long term | Short term | Medium term | Long term | Short term | Medium term | Long term |
| Extreme precipitation | 39.09 | 40.98 | 0.10 | 44.04 | 0.10 | 39.21 | 38.76 | 0.10 | 0.10 |
| Extreme heat | 47.23 | 53.48 | 46.33 | 38.39 | 41.45 | 85.49 | 68.49 | 44.69 | 87.30 |
| Extreme cold | 46.13 | 43.49 | 1.34 | 2.81 | 46.13 | 46.13 | 1.34 | 8.77 | 1.34 |
| Typhoon | 0 | 0 | 0 | 3.63 | 0 | 0 | 0 | 0 | 0 |
| Sea level rise | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Global warming | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

“Based on the physical risk assessment, extreme heat, extreme cold, and extreme precipitation are identified as the three material physical risks faced by Beijing Gas.”

Extreme heat is the most significant physical risk, expected to trend upwards over time and in higher-emission scenarios. Under the low-emission scenario, nearly half (50%) of Beijing Gas' assets are exposed to high or extremely high risks. As emissions concentration increases, over 80% of the assets are exposed to high or extremely high risks under the baseline-emission scenario.

Beijing Gas faces relatively high risks from extreme precipitation, which are expected to fluctuate over time. The impact of the extreme precipitation risk is higher under low-emission and baseline-emission scenarios, and notably the highest in the short term under the baseline-emission scenario.

Beijing Gas faces an overall low typhoon risk, with small fluctuations over time. This risk only impacts its assets in the short term under the baseline scenario. Therefore, the overall impact of the typhoon risk on Beijing Gas is extremely low.

Beijing Gas faces relatively high risks from extreme cold, which are expected to be significantly alleviated in the latter half of this century as the emission scenario and time span evolve.

Beijing Gas faces relatively low risks from sea level rise. Combining the digital elevation model (DEM)¹² and geographic information system (GIS)¹³, we analyzed how an extreme 110 cm sea level rise scenario would play out for all subsidiaries. The analysis shows that most of Beijing Gas' subsidiaries and their affiliated companies would not be affected by such an extreme scenario. Therefore, sea level rise has an overall extremely low impact on Beijing Gas.

Beijing Gas faces relatively low risks from global warming. The global warming trend has been confirmed by integrated climate system observations and multiple key indicators. Under the broad context of climate change, all of Beijing Gas' operating regions will be impacted to some extent. However, in the short and medium term, the risk is extremely low for Beijing Gas.

¹¹ The table shows the proportion (%) of Beijing Gas' assets exposed to high risks and extremely high risks, with darker color representing more severe physical risks.

¹² Digital Elevation Model (DEM): A geographic information system (GIS) data type that digitally represents the elevation of the Earth's surface through discrete elevation data or grid cells, providing detailed terrain information for applications such as geomorphological analysis, hydrological simulations, and visual representations.

¹³ Geographic Information System (GIS) technology: A tool based on computer science and geographic science for capturing, storing, analyzing, managing, and presenting geospatial data.

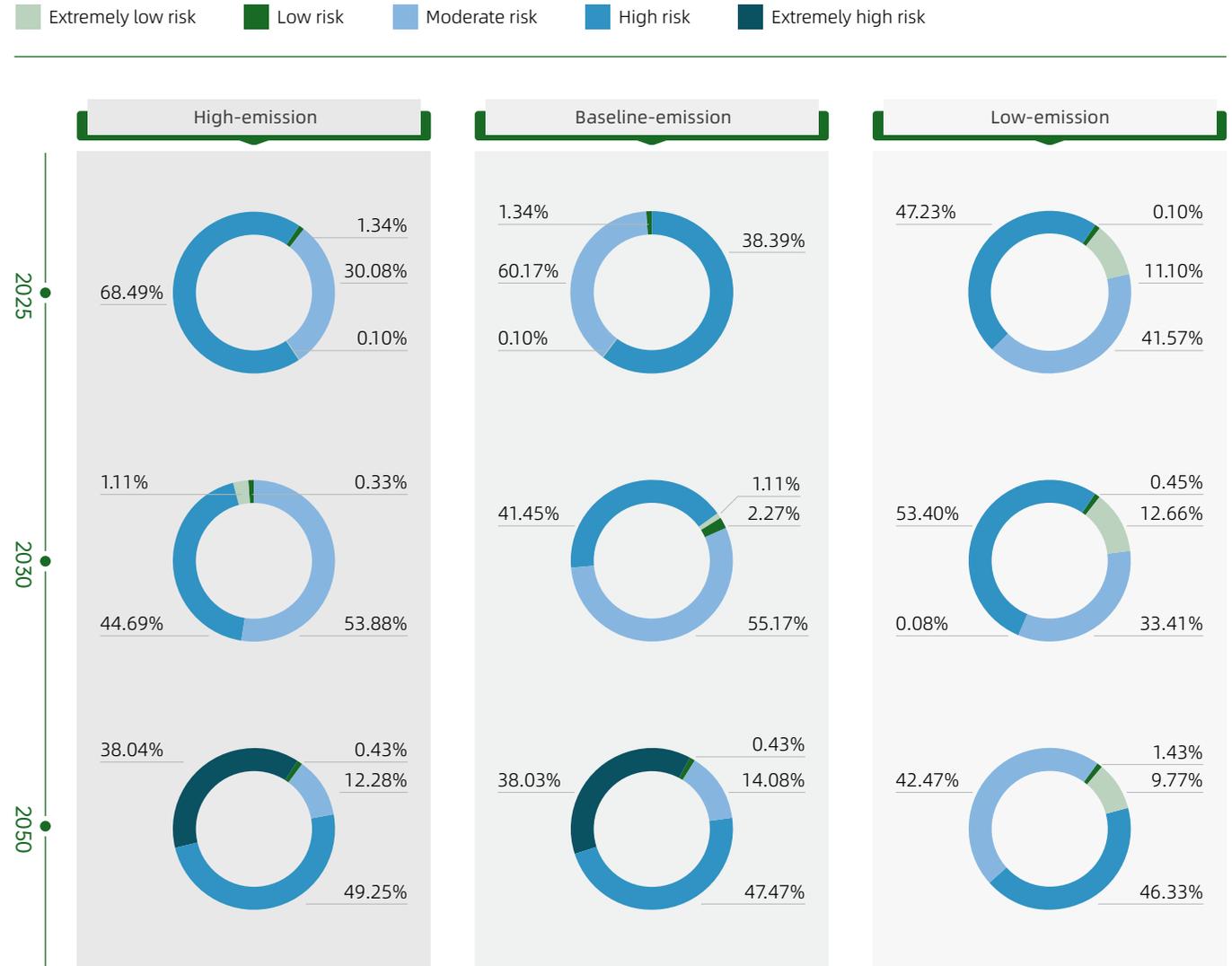
Beijing Gas's operations span across various provinces and regions in China, where climatic patterns and physical risks differ significantly. As a result, the physical risks faced by Beijing Gas in different places will evolve differently, both spatially and temporally under the three climate scenarios. To further understand the impact of material physical risks on Beijing Gas and formulate adaptation countermeasures, we delve into the degree of impact of the aforementioned three risks from the perspectives of operating regions and premises.

Extreme Heat

According to the analysis of operating regions, the extreme heat risk faced by Beijing Gas varies significantly by region. The Beijing-Tianjin-Hebei region is the most susceptible to extreme heat, which trends upward in both its frequency and duration year by year. In the long term, this region will be exposed to extremely high climate risks. Guangxi is relatively sensitive to extreme heat, facing extremely high climate risks even under the baseline-emission scenario in the long term, which is attributable to its geographical location and climatic conditions. The extreme heat risks in Heilongjiang and Xinjiang are relatively low, possibly due to their high latitudes, cold climates, and short summers. Under the three emission scenarios, the extreme heat risks in Heilongjiang and Xinjiang demonstrated limited trends of change.

According to the analysis of operating premises, since most subsidiaries and their affiliated companies are located in the Beijing-Tianjin-Hebei region, they are all exposed to high risks under the three scenarios. Notably, the gas engineering construction and high-pressure pipeline companies will face extremely high risks in the long term under the baseline scenario. Moreover, extreme heat may cause pipeline material expansion and increased thermal stress, thereby increasing the risks of pipeline leakage and damage. Extreme heat can also increase the safety risks associated with the construction and installation of gas equipment, as high temperatures may adversely affect equipment performance and reliability. The engineering and construction work is mostly carried out outdoors where workers underperform due to heat-induced fatigue, which slows down construction progress and compromises efficiency. Furthermore, heat stress-related illnesses such as heat stroke, heat exhaustion, and dehydration may pose threats to the health and safety of construction workers.

Proportion of Assets Affected by Extreme Heat under Different Scenarios and over Different Time Span

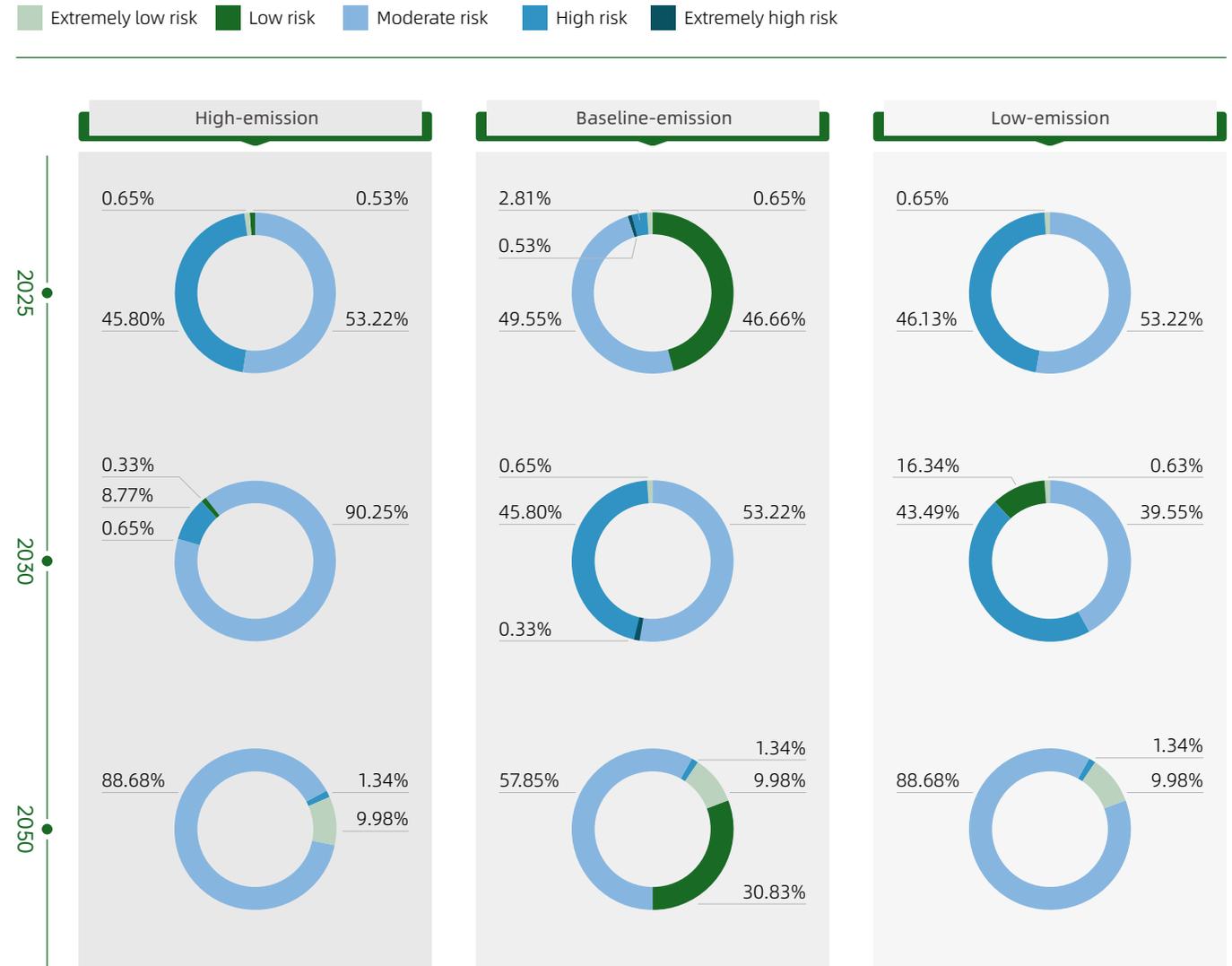


Extreme Cold

The analysis of operating regions shows that the extreme cold risks faced by Beijing Gas vary significantly by region. The Beijing-Tianjin-Hebei region and Northeast China are the most susceptible to extreme cold, which trends upwards in both its frequency and duration year by year; in the long term, these regions will be exposed to extremely high climate risks. Jiangsu, Guangxi, and Hainan face relatively low risks across all time periods and in all climate scenarios.

According to the analysis of operating premises, the gas and energy supply companies in Heilongjiang face extremely high risks under the low-emission and baseline-emission scenarios. Extreme cold weather events usually increase electricity demand significantly, mostly for heating. Gas companies and energy supply companies need to ensure reliable and stable power supply to meet user demand. Extreme cold weather may cause freezing of power generation equipment, increasing the risks of equipment damage and power outages. Energy companies need to strengthen equipment protection and maintenance by taking measures to prevent freezing and malfunctions.

Proportion of Assets Affected by Extreme Cold under Different Scenarios and over Different Time Spans

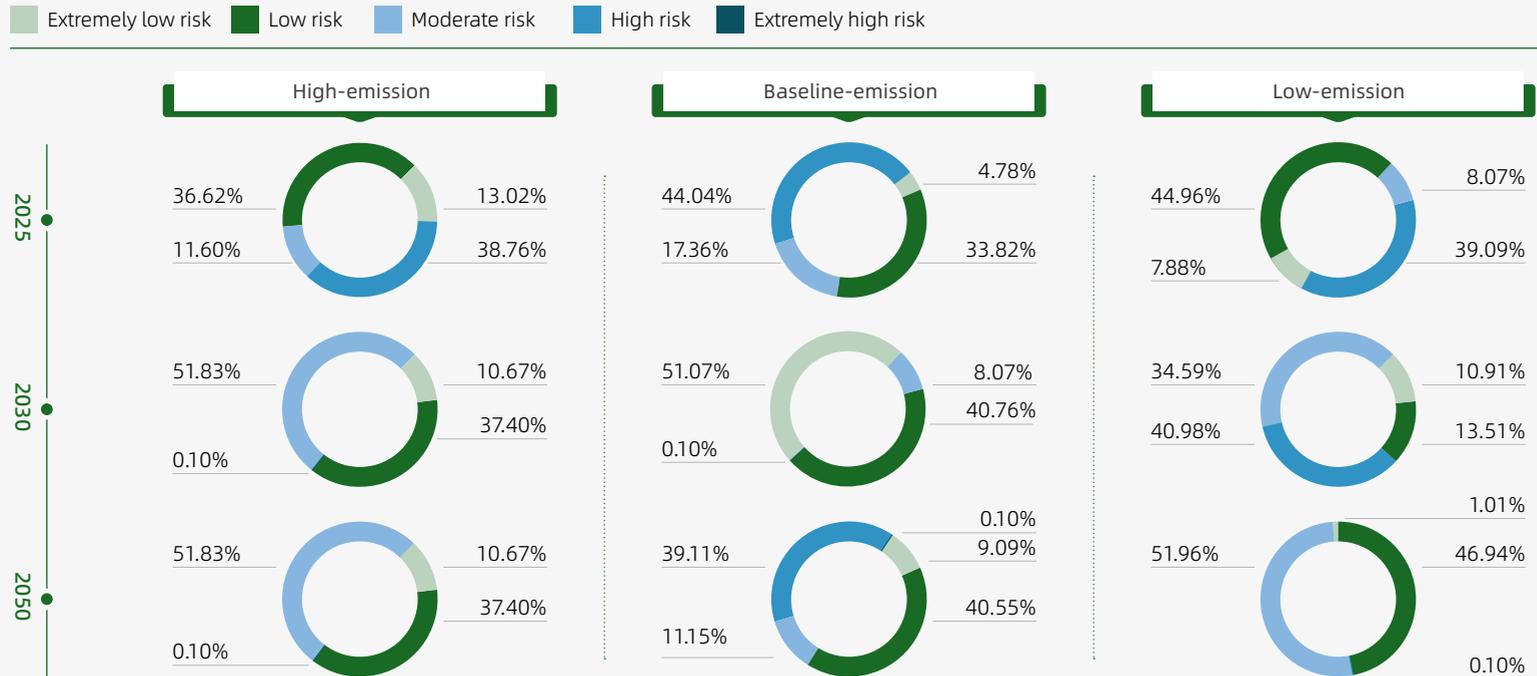


Extreme Precipitation

According to the analysis of operating regions, the risks of extreme precipitation faced by Beijing Gas vary significantly by region. Beijing and Hainan face the highest risk of extreme precipitation, with a high possibility of being exposed to high risks in the medium and long term. Tianjin faces overall relatively stable risk of extreme precipitation, which is high only in the short term under the baseline-emission scenario and stays moderate over other time spans or in other scenarios. The risk of extreme precipitation in Jiangsu will trend upwards over time. In Heilongjiang, Shaanxi, and Xinjiang, the risk stays relatively low, probably due to their geographical locations and climate patterns. For example, Xinjiang is deep inland with a continental climate, which makes its precipitation mechanism significantly different from other operating regions located in the Asian-Australian monsoon region.

From the perspective of operating premises, the subsidiaries of Beijing Gas that specialize in city gas supply face relatively high risks overall, particularly for some of them. The city gas subsidiaries own numerous gas pipeline assets, and extreme precipitation may increase the risk of damage to underground pipelines and equipment. Flooding, landslide or soil erosion may damage gas pipelines, compromising the continuity of gas supply. Extreme precipitation may also increase the risk of gas leaks and fires. City gas subsidiaries need to strengthen safety training and enhance safety awareness and take appropriate measures to reduce the risk of leaks and other safety incidents.

Proportion of Assets Affected by Extreme Precipitation under Different Scenarios and over Different Time Spans



Beijing Gas braved the "July 23 Severe Rainstorm" in North China

On July 29, 2023, North China was hit by a historically rare severe rainstorm that wreaked havoc with its significantly extreme levels of both accumulated rainfall and duration in the region. Many areas including western Beijing, central and southwestern Hebei experienced severe rainstorms, with accumulated rainfall exceeding 400 mm, even reaching 1,000 mm in some parts.

Beijing Gas braved the natural disaster, focusing on the following five areas:

Work deployment: Organizing multiple meetings to coordinate with governments at all levels and towns/townships, and timely issuing work arrangements and early warning notices to subsidiaries;

Flood guard: Initiating the highest level of emergency response, and setting up flood guard booths equipped with personnel and vehicles;

Construction suspension: Fully suspending all construction projects and production operations while making emergency preparations;

Pipeline inspection: Inspecting the operations of key pipeline networks more vigorously, including regulation stations, valve chambers, and pipeline nodes;

Customer service: All business departments promptly handled flood-triggered gas-related issues reported by residents to ensure gas supply.

During the post-disaster reconstruction, Beijing Gas invested RMB 715 million in pipeline repairs and emergency gas supply through installing emergency gas supply facilities and connection to municipal pipelines, achieving safe and efficient supply restoration for affected users. By the end of 2023, all impacted users had their gas supply fully restored.

Adaptation Analysis

To mitigate the adverse impacts of climate change on its assets and operations, Beijing Gas has implemented a series of adaptation measures, including strengthening climate risk emergency preparedness, ensuring stable energy supply under extreme weather conditions, and insuring against climate risks. Such efforts will continue over the next five years. On top of that, after assessing its existing adaptation capabilities, Beijing Gas has formulated further adaptation measures.



Bolstering Emergency Response

To ensure rapid and scientific responses to extreme weather events and mitigate disaster losses, Beijing Gas has formulated emergency plans for extreme weather and an emergency command system to waste no time in responding to natural disasters such as rainstorms, floods, thunderstorms, and hail. Beijing Gas has also established an emergency response mechanism, further detailing contingency plans for specific scenarios such as underground space seepage/flooding, ruptures and drifting of river-crossing gas pipelines. Through these measures, Beijing Gas aims to make continuous improvement in promptly responding to and recovering from extreme weather events.

To ensure efficient and satisfactory response to extreme weather events, Beijing Gas regularly provides safety training regarding rainstorms, high temperatures, and other extreme weather conditions to all employees, aiming to popularize and reinforce knowledge about emergency response in such scenarios. Building on this, regular drills are conducted to enhance employees' hands-on abilities in implementing emergency procedures.

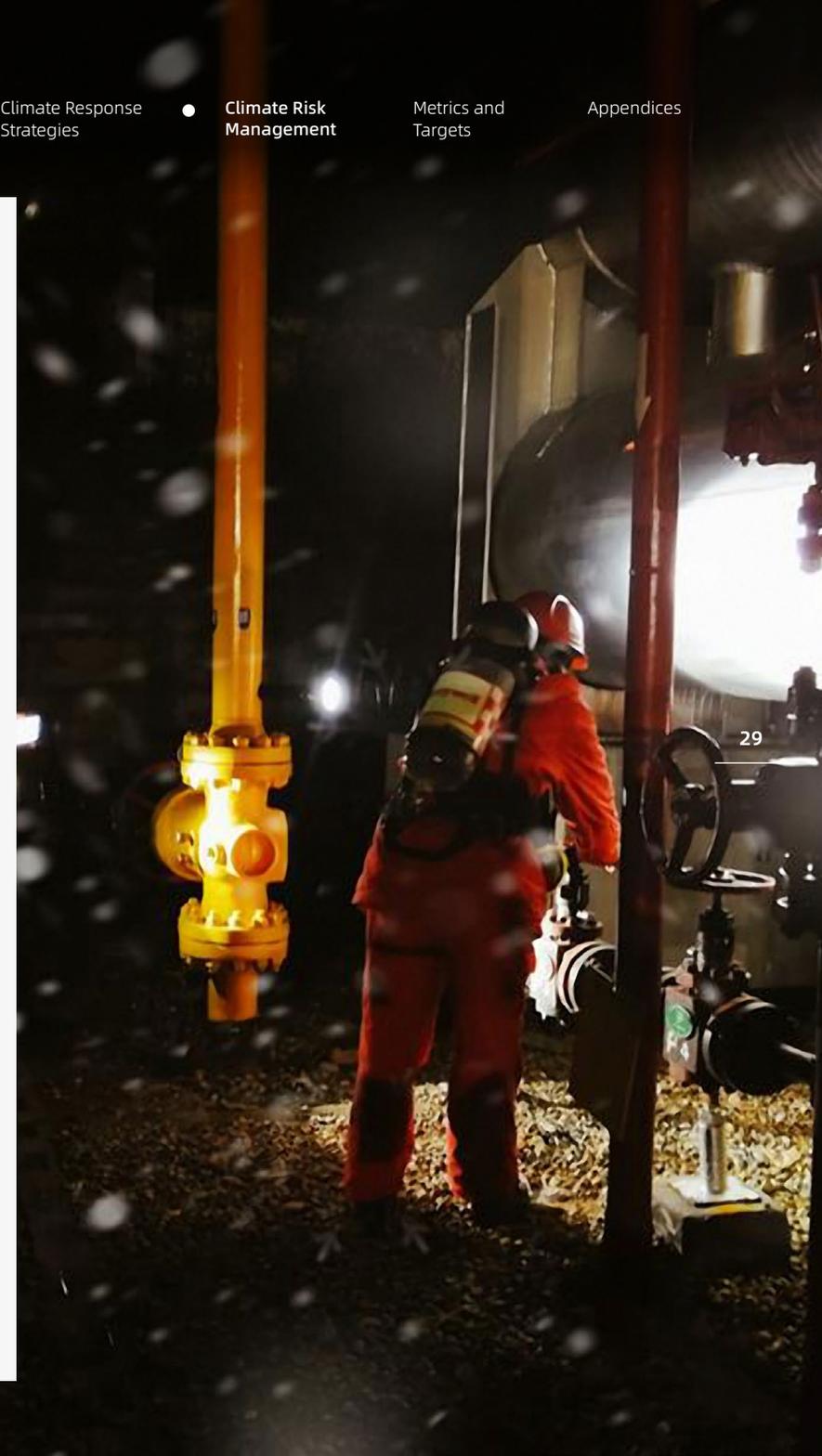


Implementing Preventive Measures

Beijing Gas has implemented holistic measures against extreme weather that require protection of employee health and safety and preventive maintenance of facilities.

To protect employee health and safety, Beijing Gas implements on-site safety measures and distributes protective equipment to ensure the safety of rescue personnel and operational personnel; during extreme heat or cold, it provides cooling or warming supplies to outdoor workers and construction crews and schedules outdoor work reasonably to avoid exposure to extreme heat or cold.

Regarding preventive maintenance of equipment and facilities, Beijing Gas conducts routine inspections and maintenance to ensure they are in good conditions and increase their resilience against extreme weather. Specifically, during hot days, fire sprinklers regularly spray water on gas pipelines and other equipment to lower surface temperatures and prevent overpressure; outdoor equipment is only turned on when necessary. During cold days, gas pipelines and equipment are insulated in advance to prevent damage and pipeline ruptures due to extreme cold. During heavy rains, in more risky areas, inspections are stepped up, and emergency flood control measures are implemented, such as examining pipeline more thoroughly, and promptly repairing gas pipelines exposed or damaged by landslides or flood scouring.





Ensuring Energy Supply

Natural gas is an important energy source in Beijing's energy mix. In cases of extreme heat or cold or other hostile weather events happen in Beijing, it will directly lead to fluctuations in energy consumption across the city, thereby causing more frequent changes in natural gas demand. Specifically, during the heating season, according to historical data, for every 1°C drop in temperature, natural gas consumption for heating will increase by 3 million cubic meters/day. During non-heating seasons, changes in temperature, wind, and sunlight and other aspects of climate affect Beijing's electricity demand and power generation with new energy, which in turn impacts the overall natural gas consumption for gas-fired power generation in Beijing. Overall, under extreme weather conditions, Beijing's heat-electricity-gas-coupled energy mix needs better performance in peak shaving and stabilizing supply of natural gas to function well.

To ensure safe and stable energy supply, Beijing Gas has planned a comprehensive host of measures to address climate risks: First, focus

more on the identification of climate risks and prepare for risk response in advance. To that end, Beijing Gas works with relevant departments such as the meteorological bureau to conduct climate analysis and forecasting and subscribes to customized meteorological forecasting and early warning services; that informs its climate analysis and forecasting on an annual, monthly, weekly, and daily basis for the purpose of allocating resources in advance. Second, expand the peak-shaving resource pool to meet demand during extreme weather conditions. As an upstream resource supplier and a pipeline transmission service provider, Beijing Gas vigorously fulfills its responsibilities in peak shaving; it proceeds with the construction and utilization of its own emergency reserve facilities to improve the resource pool for ensuring supply within Beijing, fulfilling its responsibilities for supply assurance. Third, tapping into the integrated platform for heat, electricity and gas dispatch and supply, Beijing Gas promotes coordinated and consistent actions among all relevant entities in Beijing's energy supply chain to jointly counter risks compromising energy supply during extreme weather events.



Insuring against Climate-related Risks

Beijing Gas has acquired insurance coverage against natural disasters related to climate change, including lightning, rainstorms, floods, hail, blizzards, landslides, collapse, mudslides, and subsidence. The insurance covers project damages, operational interruptions, and employee health, among others. Personal safety insurance for employees will provide them with financial compensation in case of safety incidents. Natural disaster insurance covering production facilities and other assets will allow Beijing Gas to receive corresponding compensation if the facilities are damaged by extreme weather events.



Further Measures

Strengthening climate resilience of infrastructure through better construction and management: Moving forward, Beijing Gas will further reinforce the awareness of climate change in its planning, strengthen monitoring and pre-warning of the impact of climate change on infrastructure, and dynamically assess risk levels and intensities. In planning and design of new projects, it will thoroughly consider the medium and long-term impact factors of climate change and raise the bar for their design and construction to increase their climate resilience.

Incorporating assessments of climate-related risks and opportunities into investment decision-making: Going forward, Beijing Gas will assess the threats and risks facing its investment portfolio and accordingly inform strategic planning, business operations, investment decision-making, among others. Proactive response measures will be implemented across business segments and relevant processes to mitigate business risks.

Transition Risks and Opportunities

The transition risks faced by Beijing Gas' business include the transition to a low-carbon energy mix, increased pricing of GHG emissions, methane emission reduction, and enhanced emissions-reporting obligations. The opportunities include development of the natural gas business, expansion into new energy businesses, and improvement in energy efficiency. Fully aware of the significant negative and positive impacts of the transition risks and opportunities on its business, Beijing Gas has formulated mitigation measures and response strategies accordingly.

Risk Impact Analysis

In accordance with its business characteristics, Beijing Gas has comprehensively analyzed the potential and actual impacts of the identified climate transition risks and opportunities on its business, operations, and finances, in order to formulate targeted countermeasures.

Beijing Gas's Transition Risk Impact Analysis

| Transition risks | Trend | Related business segments | Duration of impact | Impact on Beijing Gas |
|---|------------|--------------------------------------|---------------------------------|---|
| Transition to a low-carbon energy mix | Increasing | City gas | The short, medium and long term | National policies have dictated the adjustment of energy mix to achieve the transition from high-carbon to low-carbon development and the upgrading from a fossil fuel-dominated energy system to a new system that is clean, low-carbon, secure, and efficient. Against this background, city gas companies relying primarily on natural gas as their source of gas will be under pressure to reduce carbon emissions. The transition to a low-carbon energy mix will gradually reduce natural gas consumption, potentially leading to a decline in the natural gas business and eroding Beijing Gas' main business revenue. Shutting down existing fossil fuel assets and making moves for transitioning in the future will incur significant costs, including decommissioning fees and losses from asset sales, etc. |
| Increasing pricing of GHG emissions | Increasing | City gas, and LNG | The medium and long term | According to the recommendations of the IEA, the global average carbon price needs to increase to align with the carbon reduction pathway to limit global warming to 1.5° C. China has established a carbon trading scheme, and three operating locations of Beijing Gas have already been included in local carbon trading schemes. With future changes in regulations and carbon quota allocation methods, Beijing Gas may face higher carbon trading costs. In the meantime, thorough carbon accounting and verification and reduction efforts, as a prerequisite for participating in carbon trading schemes, will increase Beijing Gas' management and operating costs. |
| Methane emission control | Increasing | City gas, LNG, and integrated energy | The short, medium and long term | Methane is the second largest GHG contributor to global warming. Methane emission reduction in the energy sector has garnered increasing attention in recent years. Methane emission occurs at every stage of the oil and gas industry. While downstream city gas companies are not the main source of methane emissions, they can achieve low-carbon development by continuously promoting methane control and reduction across their business chains. In 2023, the Ministry of Ecology and Environment and 10 other ministries issued the <i>Methane Emission Control Action Plan</i> , urging methane emitters to build systems of methane emission monitoring, accounting, reporting and verification, enhance comprehensive methane utilization, and strengthen leak detection and repair technologies, among others. Such requirements may lead to an increase in Beijing Gas' operating costs. |
| Enhanced emissions-reporting obligations | Increasing | City gas, LNG, and integrated energy | The medium and long term | As national policies related to carbon reduction become increasingly stringent, and environmental disclosure laws and regulations tighten, Beijing Gas faces growing regulatory requirements for disclosing its emission reduction targets, measures, and results, which may increase Beijing Gas' data monitoring and disclosure costs. It also faces potential risks such as project delays, hefty fines, and compliance costs. |
| Unsuccessful investment in new technologies | Increasing | LNG and integrated energy | The medium and long term | City gas companies are actively addressing challenges posed by the global energy transition and pursuing sustainable development by developing and applying low-carbon, zero-carbon, and even negative-carbon technologies, upgrading traditional gas businesses, and expanding into new energy businesses. The transition to low-carbon technologies may incur additional expenses for facility retrofits, introduction of new technologies and talents, and low-carbon technology R&D, among others, leading to an overall increase in operating costs of Beijing Gas. |

| Transition risks | Trend | Related business segments | Duration of impact | Impact on Beijing Gas |
|--|------------|-------------------------------------|--------------------------|--|
| Changes in market demand | Increasing | City gas | The medium and long term | With the low-carbon transition trend in the gas industry, future changes in upstream raw material (e.g., natural gas) supply prices may lead to increased operating costs. A decline in demand for natural gas-related products and services may result in reduced operating revenue from gas supply. Increasingly stringent regulatory policies on city gas prices may gradually reduce corporate marginal profits. |
| Increased stakeholder concern or negative stakeholder feedback | Increasing | City gas, LNG and integrated energy | The long term | Beijing Gas' performance in environmental protection and carbon reduction may not meet stakeholder expectations, impacting its brand image and potentially leading to a decline in operating revenue. Investors may abandon investments in fossil fuels in favor of low-carbon businesses, resulting in changes to Beijing Gas' available capital. |

Beijing Gas's Transition Opportunity Impact Analysis

| Transition Opportunities | Trend | Related business segments | Duration of impact | Impact on Beijing Gas |
|-------------------------------------|---------|-------------------------------------|---------------------------------|--|
| Development of natural gas business | Growing | City gas and LNG | The short, medium and long term | Natural gas will play a bridging and supporting role in the energy transition, especially during the carbon peaking stage (2021-2030). Natural gas is a practical choice to ensure energy security, energy mix transition, and clean energy supply. The accelerated replacement of high-carbon energy sources such as coal with natural gas may increase Beijing Gas' operating revenue. Meanwhile, the development and application of technologies such as digitalization, big data, and the IoT have ushered in new business areas and pathways for city gas companies, potentially bringing new business growth opportunities for Beijing Gas. |
| Expansion into new energy business | Growing | Integrated energy | The medium and long term | By preparing for new energy businesses in advance, city gas companies will gain a competitive advantage in the future markets of clean and green renewable energy. The development and application of clean energy will enable Beijing Gas to increase its operating revenue from new energy businesses while reducing carbon emissions. |
| Increased energy efficiency | Growing | City gas, LNG and integrated energy | The medium and long term | Enhancing energy efficiency in office, production, management, and maintenance processes through technological innovation and upgrades can reduce the consumption of resources such as electricity, natural gas, and process water, which will ultimately lower Beijing Gas' operating costs. |

Scenario Analysis – Material Risk Assessment

Beijing Gas evaluated the likelihood and impact of transition risks for different business segments and formed a risk matrix with rankings, based on parameters under different emission scenarios published by the IEA, including energy and natural gas supply, renewable energy supply, carbon dioxide emissions, and carbon pricing. This was done in combination with relevant national policies, its own energy transition plan, and other related factors.

Transition Risks

Through further analysis, the negative impacts of different climate faced by Beijing Gas were assessed in the short, medium, and long term, as well as under three climate scenarios. Accordingly, the risks have been ranked in order of priority.

All transition risks trend upwards as the time span increases. This upward trend is the most prominent under the low-emission scenario. The analysis of transition risks over time is consistent with the trend of global climate change, meaning that as global climate change progresses, the climate risks faced by Beijing Gas also gradually increase. In addition, transition risks over the medium and long term merit more attention those over the short term.

All the transition risks show a consistent pattern of "score in low-emission scenario > score in baseline-emission scenario > score in high-emission scenario". This is because under the low-emission scenario, all sectors in the society become more concerned about reducing the climate impact of enterprises. The government would require enterprises to double down on energy transition efforts and set more ambitious GHG emission reduction targets, while investors and users would pay more attention to the climate impact of enterprises. Changes in the attitudes of policymakers, investors, and consumers would set a higher bar for Beijing Gas' operating model and transition endeavors. However, in the high-emission scenario, energy and emission policies are relatively more loose, which means less attention and less stringent requirements from all parties towards Beijing Gas.



Beijing Gas's Transition Risk Assessment Result

Extremely low risk Low risk Moderate risk High risk Extremely high risk

| | High-emission Scenario | | | Baseline-emission Scenario | | | Low-emission Scenario | | |
|--|------------------------|--------------------|--------------------|----------------------------|---------------|---------------------|-----------------------|---------------------|---------------------|
| | Short term | Medium term | Long term | Short term | Medium term | Long term | Short term | Medium term | Long term |
| Transition to a low-carbon energy mix | Moderate risk | High risk | High risk | High risk | High risk | Extremely high risk | High risk | Extremely high risk | Extremely high risk |
| Increased pricing of GHG emissions | Low risk | Moderate risk | Moderate risk | Moderate risk | Moderate risk | High risk | Moderate risk | High risk | High risk |
| Methane emission control | Moderate risk | Moderate risk | Moderate risk | High risk | High risk | High risk | High risk | High risk | Extremely high risk |
| Enhanced emissions-reporting obligations | Extremely low risk | Low risk | Low risk | Low risk | Moderate risk | Moderate risk | Moderate risk | Moderate risk | Moderate risk |
| Unsuccessful investment in new technologies | Extremely low risk | Low risk | Low risk | Low risk | Low risk | Moderate risk | Moderate risk | Moderate risk | Moderate risk |
| Changes in market demand | Extremely low risk | Moderate risk | Moderate risk | High risk | High risk | High risk | High risk | High risk | High risk |
| Increased stakeholder concern or negative stakeholder feedback | Extremely low risk | Extremely low risk | Extremely low risk | Extremely low risk | Low risk | Moderate risk | Low risk | Moderate risk | Moderate risk |

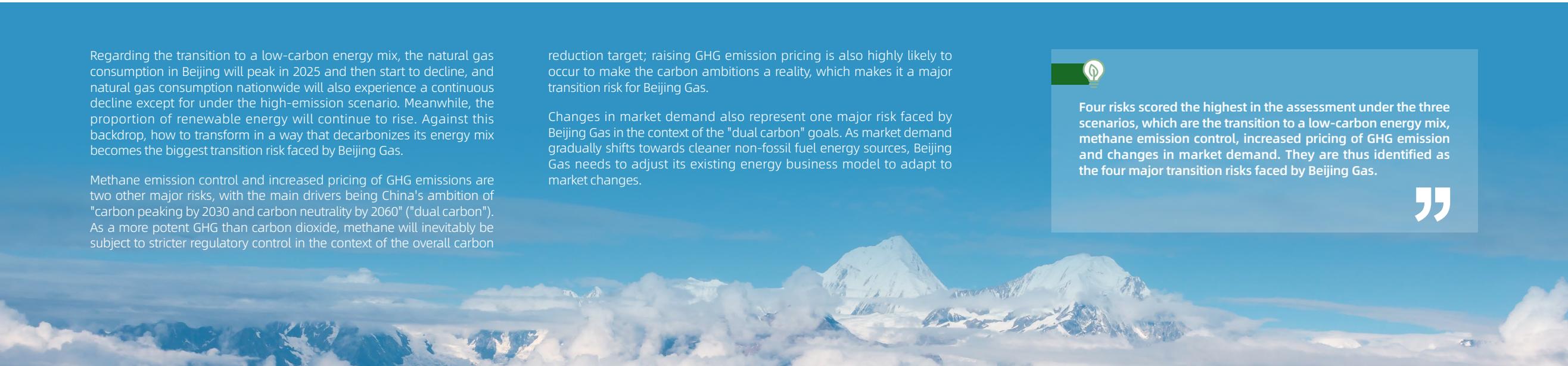
Regarding the transition to a low-carbon energy mix, the natural gas consumption in Beijing will peak in 2025 and then start to decline, and natural gas consumption nationwide will also experience a continuous decline except for under the high-emission scenario. Meanwhile, the proportion of renewable energy will continue to rise. Against this backdrop, how to transform in a way that decarbonizes its energy mix becomes the biggest transition risk faced by Beijing Gas.

Methane emission control and increased pricing of GHG emissions are two other major risks, with the main drivers being China's ambition of "carbon peaking by 2030 and carbon neutrality by 2060" ("dual carbon"). As a more potent GHG than carbon dioxide, methane will inevitably be subject to stricter regulatory control in the context of the overall carbon

reduction target; raising GHG emission pricing is also highly likely to occur to make the carbon ambitions a reality, which makes it a major transition risk for Beijing Gas.

Changes in market demand also represent one major risk faced by Beijing Gas in the context of the "dual carbon" goals. As market demand gradually shifts towards cleaner non-fossil fuel energy sources, Beijing Gas needs to adjust its existing energy business model to adapt to market changes.

Four risks scored the highest in the assessment under the three scenarios, which are the transition to a low-carbon energy mix, methane emission control, increased pricing of GHG emission and changes in market demand. They are thus identified as the four major transition risks faced by Beijing Gas.

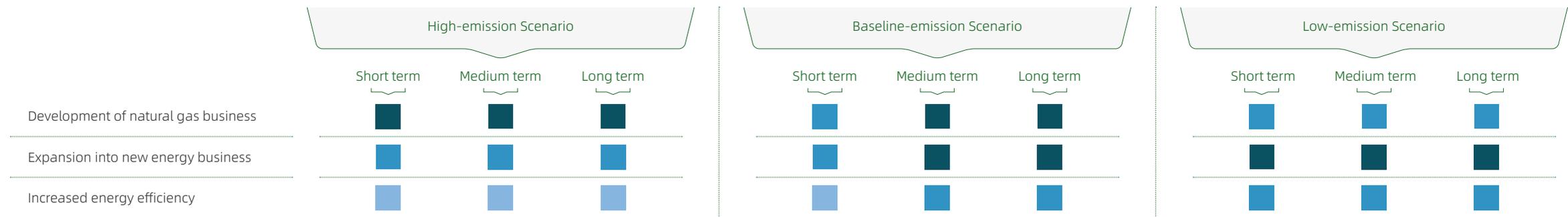


Transition Opportunities

Through further analysis, the positive impacts of different transition opportunities in the short, medium, and long term, as well as under the three climate scenarios, were evaluated, and the transition opportunities have been ranked accordingly.

Beijing Gas's Transition Opportunity Assessment Result

■ Extremely low risk
 ■ Low risk
 ■ Moderate risk
 ■ High risk
 ■ Extremely high risk



The importance of an opportunity differs across the three scenarios. Under the low-emissions scenario, the main climate-related opportunity is the expansion into new energy business. This is because the natural gas business has limited room of development under the low-emission scenario, while the development potential of new energy businesses is greater and promises more opportunities if Beijing Gas invests in it. Under the baseline-emission scenario, the development of natural gas and new energy businesses are opportunities of basically equal importance, so the development of natural gas business and

the expansion into new energy business are the main climate opportunities. However, under the high-emission scenario, development of natural gas business is identified as the main climate opportunity. This is because under this scenario, natural gas would serve as an important energy supply source while the development of new energy will be limited; in this case, further expanding the natural gas business would bring more opportunities for the business transition of Beijing Gas.


Development of the natural gas business and expansion into new energy businesses are the two opportunities that scored relatively high in the assessment across the three scenarios, and are thus identified as the two main climate-related opportunities for Beijing Gas.



Adaptive Capacity Analysis

Facing the major transition risks/opportunities, Beijing Gas continues to improve monitoring measures and promote its green and sustainable innovation and transformation, leading the industry to contribute to the "dual carbon" ambitions of the country. Anchored in the natural gas business, Beijing Gas is gradually expanding into new energy businesses and cultivating new drivers for green, low-carbon and sustainable development on its journey to pursue the strategic upgrade from "gas-focused" to "energy-focused". Meanwhile, tapping into its advantages as a high-tech enterprise, Beijing Gas proactively integrates and pools innovation resources; it actively participates in national and industrial research on key issues, and carries out research and demonstrative application of energy conservation, emission reduction, CCUS and other technologies for low-carbon and efficient gas utilization as well as new energy technologies such as hydrogen energy, energy storage, and thermal energy, providing technical support for developing new energy businesses. For more details, please refer to the "Climate Response Strategies" chapter.

Expanding Traditional Gas Business

Answering the call of the "dual carbon" strategy, Beijing Gas continues to optimize its business presence, extend and expand the natural gas industrial chain, build "smart gas", bring in green gases, and orderly expand the scale of low-carbon energy utilization.

Exploring Technological Innovation

Beijing Gas is vigorously exploring the progress from low-carbon to zero-carbon technologies and their industrial applications. Low-carbon technologies involve comprehensive and efficient utilization of natural gas that leads to end-use electrification and carbon emission reductions. Zero-carbon technologies focus on increased application of hydrogen energy, and research and industrial application of new energy storage, transforming them into core industries down the road.

Developing Emerging Low-carbon Businesses

As a relatively clean fossil fuel, natural gas, coupled with new energy, represents an important direction to follow for future power and heating systems. Setting sights on emerging low-carbon businesses, Beijing Gas is gradually shifting from gas supply to energy supply, expanding gas-related business and distributed renewable energy business to provide users with integrated energy services of cooling, heating, electricity.

Establishing a Carbon Management System

To adapt to the low-carbon transition, Beijing Gas has established a carbon management system and keeps improving it. In terms of top-level design, it has set low-carbon development targets, established a low-carbon management structure, and built a carbon asset management system. Such clear targets and plans enable Beijing Gas to better oversee the implementation of its low-carbon strategies. The concrete action taken is intelligent management to improve production efficiency and reduce resource waste.

Further Measures

Proactively keeping up with carbon-negative technologies: Going forward, Beijing Gas will prioritize the R&D of core technologies concerning CCUS. Building on that, it will seek financial gains by acting on its own or partnering with power companies for application as a new way of generating profit.

Establishing an innovation platform: Moving forward, Beijing Gas will establish a new energy technology and industrial innovation platform. It will also set up organizations and dedicated teams to work on the research and application of CCUS, new energy storage, virtual power plants, digital and intelligent technologies of integrated energy, smart low-carbon and zero-carbon industrial parks, and other hotspot and emerging areas of the new energy industry. On top of that, Beijing Gas will collaborate with domestic research institutes and universities on the research of relevant technologies, research outcome translation and industrial application. This approach will help Beijing Gas reap more fruits of independent innovation in new energy and increase its competitiveness in the mid-to-long term.

Doubling down on methane emission reduction: Beijing Gas will continue to step up inter-industry cooperation, develop demonstrative projects of methane emission monitoring and reduction, and disseminate best practices and experience.

Improving the low-carbon management system: Beijing Gas will gradually develop low-carbon projects and use more renewable energy and green electricity to reduce its own carbon emissions, or trade with low-carbon projects to offset internal carbon emissions. It will improve its internal management system of carbon assets to better tap into their value.

Financial Impact Assessment

BEHL, in accordance with the International Sustainability Standards Board (ISSB) Climate-related Disclosures (IFRS S2) framework, analyzes the impacts of physical risks and transition risks on its operations and financial status in different climate scenarios. This way, BEHL assesses the climate risks that Beijing Gas may face under different climate scenarios, as well as their impacts on Beijing Gas' operating revenue, cost, profit & loss, cash flow, and other financial indicators.

The table shows the most significant negative financial impacts caused by risks as well as the most significant positive impacts from opportunities under different climate scenarios for Beijing Gas. Given the uncertainties and limitations of the current climate risk assessment methodologies, the following assessment results are estimates.

| Assessment of Climate Change Impact on Financial Indicators ¹⁴ | | | | | | |
|---|---------------------------|---------------------------------------|-------------------|------|---------------|----------|
| Climate scenario | Major risks/opportunities | | Operating revenue | Cost | Profit & loss | Cashflow |
| High-emission scenario | Physical risks | Extreme heat | | ⊕ | ⊖ | ⊖ |
| | | Extreme cold | | ⊕ | ⊖ | ⊖ |
| | | Extreme precipitation | | ⊕ | ⊖ | ⊖ |
| Low-emission scenario | Transition risks | Transition to a low-carbon energy mix | ⊖ | ⊕ | ⊖ | ⊖ |
| | | Methane emission control | | ⊕ | ⊖ | ⊖ |
| | | Increased pricing of GHG emissions | | ⊕ | ⊖ | ⊖ |
| | | Changes in market demand | ⊖ | ⊕ | ⊖ | ⊖ |
| | Opportunities | Expansion into new energy business | ⊕ | ⊕ | ⊕ | ⊕ |
| | | Development of natural gas business | ⊕ | ⊕ | ⊕ | ⊕ |

¹⁴ Financial indicator impact assessment: "+" means an increase in financial indicator and "-" a decrease in financial indicator.

| Estimates of the Financial Impact of Climate Change | | | | | | |
|---|--------------------------------|---|--------------------------------|-----------|---------|--|
| Climate scenario | Major risks/opportunities | | Financial impact (RMB Million) | | | |
| | | | < 500 | 500-1,500 | > 1,500 | |
| High-emission scenario | Physical risks (long-term) | Extreme heat, extreme cold and extreme precipitation | ☑ | | | |
| Low-emission scenario | Transition risks (medium-term) | Transition to a low-carbon energy mix, and changes in market demand | | | ☑ | |
| | | Methane emission control, and increased pricing of GHG emissions | ☑ | | | |
| | Opportunities (medium-term) | Expansion into new energy business | | | ☑ | |
| | | Development of natural gas business | | ☑ | | |



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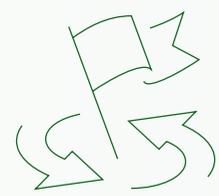
Metrics and Targets

To vigorously proceed with the strategic transformation, we have established climate-related management metrics and targets, including GHGs and energy consumption, to measure and evaluate the progress and effectiveness of our climate actions. This Report details the climate change targets and progresses of Beijing Gas, while such information of other business segments is provided in the *Beijing Enterprises Holdings Limited 2023 Sustainability Report*.

Targets and Pledges

BEHL has set the target of "carbon peaking by 2030". To align with the Company's green development concept and make steady strides towards the target, each business segment has made scientific business plans and set specific carbon reduction targets stage by stage. In the future, we will further promote carbon footprint accounting across the value chain of each business segment and collaborate with upstream and downstream partners to build a resilient and sustainable industrial chain.

To implement its climate response strategies, Beijing Gas has established relevant management metrics, covering natural gas sales volumes in city gas business, LNG sales volumes, hydrogen production scale, heat source development scale, scale of power generation with new energy, GHG emissions, and carbon trading compliance costs.



BEHL Carbon Target

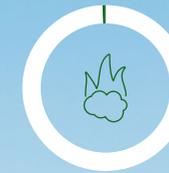
By 2030, BEHL will achieve

carbon peaking

Beijing Gas Methane Emission Targets

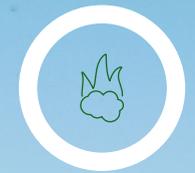
By 2025, methane emission intensity will be kept

below **0.12%**



By 2030, methane emission intensity will be reduced to

near zero



Action Plans

In line with the requirements of Beijing and the country for advancing the "dual carbon" strategy and the prevalent trend of energy transition, Beijing Gas is proceeding with the strategic shift from "gas-focused" to "energy-focused" and coordinating the development of new energy-related businesses such as photovoltaics, wind power, energy storage, hydrogen energy, geothermal energy, and integrated energy in stages.

By the end of 2023, Beijing Gas has actively explored new energy businesses in multiple industries under the model of pilot and then scaleup. In the power generation industry, it has made forays into PV businesses and is steadily advancing the construction of pilot centralized PV power stations. In the heating industry, it has ventured into integrated-energy heating, and heat source development pilots are also proceeding progressively. In addition, Beijing Gas is also steadily promoting pilot businesses such as hydrogen production plants and hydrogen stations and electrochemical energy storage charging piles.



The industrialization transformation of Beijing Gas's new energy is divided into three stages:



| Power generation-related | Energy storage | Integrated-energy heating | Hydrogen energy-related | R&D |
|--|---|--|--|--|
| <ul style="list-style-type: none"> √ Distributed photovoltaics ○ Centralized power plant | <ul style="list-style-type: none"> ○ Electrochemical energy storage (charging piles) ○ Compressed-air energy storage ○ Pumped storage hydropower | <ul style="list-style-type: none"> √ Integrated energy heating ○ Heat source development | <ul style="list-style-type: none"> ○ Hydrogen production plant ○ Hydrogen station ○ Hydrogen blending | <ul style="list-style-type: none"> ○ Hydrogen blending ○ Fuel cell ○ Solid-state battery ○ Energy-efficient combustion |

Note: √ Implemented industries ○ Pilot industries

Metrics Values

Beijing Gas attaches great importance to GHG management. It pays constant attention to, tracks and reports its own GHG emissions, zealously seeking opportunities to reduce GHG emissions in multiple ways and fields. Beijing Gas is also concerned about its own carbon quota and the gap with it, striving to control GHG emissions in all ways possible to minimize the impact of climate change.

Beijing Gas adopts the financial control approach to define the scope of GHG emissions accounting, which includes Beijing Gas' three main businesses: city gas, LNG, and integrated energy.

Table: Beijing Gas GHG Emissions by Business Segment 2021-2023 (tCO₂e)¹⁵

| | Year | Scope 1 | Scope 2 | Total |
|---------------------------|------|-----------|-----------|-----------|
| City gas segment | 2023 | 13,114.5 | 24,632.0 | 37,746.5 |
| | 2022 | 11,999.2 | 20,189.0 | 32,188.3 |
| | 2021 | 14,316.2 | 21,197.3 | 35,513.4 |
| LNG segment | 2023 | 10,656.3 | 55,238.9 | 65,895.2 |
| | 2022 | 7,578.8 | 32,680.7 | 40,259.6 |
| | 2021 | 2,361.4 | 28,588.5 | 30,950.0 |
| Integrated energy segment | 2023 | 229,700.1 | 77,064.4 | 306,764.5 |
| | 2022 | 201,668.9 | 45,223.2 | 246,892.1 |
| | 2021 | 169,982.3 | 43,230.3 | 213,212.6 |
| Total | 2023 | 253,470.9 | 156,935.3 | 410,406.2 |
| | 2022 | 221,246.9 | 98,092.9 | 319,339.9 |
| | 2021 | 186,659.9 | 93,016.1 | 279,676.0 |

Beijing Gas's total GHG emissions in 2023 (including Scope 1 and Scope 2) reached 410,406.2 tonnes of carbon dioxide equivalent (tCO₂e), up by approximately 46.7%¹⁶ compared to 279,676.0 tCO₂e in 2021. The main reason for the increase is that Beijing Gas is still undergoing gradual business expansion, which drives energy consumption to trend upwards; in addition, in 2023, there was a change in the statistical scope for GHG emission calculation as additions to the consolidated companies.

Considering the increase in both gas sales and energy supply driven by business growth in 2023 over 2021, the GHG emission intensities of all business segments of Beijing Gas except city gas, namely LNG and integrated energy segment, have demonstrated a trend of visible decrease. For the city gas segment, the gas sales volume increased slightly from 18.9 billion Nm³ in 2021 to 20.1 billion Nm³ in 2023, and its emission intensity stabilized at around 0.0188 tCO₂e/10 thousand Nm³; for the LNG segment, as the Tianjin Nangang project gradually became operational in 2023, the LNG sales volume increased significantly compared to that in 2021 and GHG emission intensity decreased from 0.4421 tCO₂e/10 thousand Nm³ in 2021 to 0.2865 tCO₂e/10 thousand Nm³ in 2023; for the integrated energy segment, the energy supply increased due to the increase in heating area, and its emission intensity decreased from 0.0757 tCO₂e/GJ to 0.0694 tCO₂e/GJ.

Factoring in the operational characteristics of each business segment, Beijing Gas has conducted a detailed analysis of its main carbon emission sources: Scope 1 emissions mainly include direct emissions from fuel combustion and industrial production processes, involving energy types such as gasoline, diesel, natural gas, and liquefied petroleum gas; Scope 2 emissions mainly include indirect emissions, involving purchased electricity, purchased heat, and purchased steam. The total GHG emissions data were arrived at by calculating the data of each business segment and then aggregating them.

¹⁵ The basis for accounting: *Requirements for carbon dioxide emission accounting and reporting: Other industrial enterprises* (DB11/T 1787-2020) for city gas segment; *Requirements for carbon dioxide emission accounting and reporting: Service enterprises* (DB11/T 1785-2020) for LNG segment; *Requirements for carbon dioxide emission accounting and reporting: Service enterprises* (DB11/T 1785-2020) for integrated energy segment. Purchased electricity is converted based on the national grid emission factors specified in the *Notice on Properly Carrying out Key Tasks Related to Management of Enterprise Greenhouse Gas Emissions Reporting in 2022* issued by the Ministry of Ecology and Environment of China.

Statistical scope: In 2021&2022, carbon emission and energy consumption data were collected from 47 companies of Beijing Gas, including 30 companies in the city gas segment, 4 in the LNG segment, and 13 in the integrated energy segment (covering the headquarters and joint venture companies). In 2023, one new company was added to the city gas segment and one to the LNG segment, for a total of 49 companies of Beijing gas carbon emissions and energy consumption data.

Units: Emissions are measured in tonnes of carbon dioxide equivalent (tCO₂e); the emission intensity for city gas segment and LNG segment is measured in tCO₂e/10 thousand Nm³, and the emission intensity for the integrated energy segment is measured in tCO₂e/GJ.

¹⁶ Due to the company's implementation of working from home in 2022, the relative increase in greenhouse gas emissions compared with the previous year in 2021 is relatively low. In 2023, the company's greenhouse gas emissions increased compared with the previous year due to the resumption of office operations and business expansion.

Appendices

Appendix 1 TCFD Guidance

| Recommendation | Recommended disclosures | Chapters | Pages |
|---------------------|--|---|--|
| Governance | a) Describe the board's oversight of climate-related risks and opportunities | Climate Governance | P7 |
| | b) Describe management's role in assessing and managing climate-related risks and opportunities | Climate Governance | P7 |
| Strategy | a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term | Climate Risk Management | P23 - P37 |
| | b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning | Climate Risk Management | P9 - P17 |
| | c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario | Climate Response Strategies Climate Risk Management Metrics and Targets | P9 - P14, P21 - P22, P24 - P30, P33 - P37, P40 |
| Risk management | a) Describe the organization's processes for identifying and assessing climate-related risks | Climate Risk Management | P20 - P22 |
| | b) Describe the organization's processes for managing climate-related risks | Climate Risk Management | P29 - P30, P36 |
| | c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management | Climate Response Strategies Climate Risk Management | P9 - P18, P20 - P37 |
| Metrics and Targets | a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process | Metrics and Targets | P39 - P41 |
| | b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas emissions, and the related risks | Metrics and Targets | P41 |
| | c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets | Metrics and Targets | P39 - P41 |

Appendix 2 Parameters Selection for Scenario Analysis

As an energy supply company, Beijing Gas may be more susceptible to the impacts of transition risks, but consideration of transition and physical risks complement each other in assessing climate-related consequences, and both considerations should be informed by understanding the comprehensive impacts of climate change and the resilience of various organizations to such impacts. In light of this thinking, Beijing Gas constructs scenarios using publicly available data sources, including assessments and reports on climate emission pathways from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA).

For physical risks, the main parameters considered in the scenario analysis are listed in *Appendix 3 Risk Assessment Indicators*.

As for transition risks, the main parameters/assumptions considered in the scenario analysis are as follows:

Driving Factors for Transition Risks under Different Scenarios

| Transition risks | | Drivers | Low-emission scenario | Baseline-emission scenario | High-emission scenario |
|------------------|--|---|---|---|---|
| Risk category | Risk sub-category | | | | |
| Transition risks | | China's NDC ¹⁷ | Carbon neutrality achieved ahead of schedule | Carbon peaking by 2030, and carbon neutrality by 2060 | Carbon neutrality not achieved by 2060 |
| Policy & legal | Transition to a low-carbon energy mix | Natural gas usage in Beijing | Beijing's natural gas usage peaks in 2025 and then declines | | |
| | | China's natural gas usage | China's natural gas usage continues to decline, down by 55% in 2050 over the 2021 level | China's natural gas usage continues to grow, plateaus in 2040 and then starts to decline, with natural gas accounting for 14.5% and 10% of energy consumption in 2030 and 2050 respectively | China's natural gas usage continues to grow, accounting for 14.9% and 15.3% of energy consumption in 2030 and 2050 respectively, not expected to pose risks |
| | | Renewable energy usage/supply | By 2050, nearly 90% of electricity will come from renewable sources | Renewable energy accounts for 18.07% and 53.19% of energy supply in 2030 and 2050 respectively | Renewable energy accounts for 15.5% and 31.76% of energy supply in 2030 and 2050 respectively |
| | | Energy consumption limit per unit of product/output | Energy consumption limits per unit of product/outpour are gradually tightened | Energy consumption limits per unit of product/outpour are gradually tightened | Energy consumption limits per unit of product/outpour will not be further tightened, not expected to pose risks |
| | Increased pricing of carbon emissions | China's carbon pricing | USD 90, 160 and 200 (2020) in 2030, 2040 and 2050 respectively | USD 30, 95 and 160 (2020) in 2030, 2040 and 2050 respectively | USD 17 (2019) in 2025; USD 30, 45, and 55 (2020) in 2030, 2040 and 2050 respectively |
| | Methane emission control | Requirements for methane emission control | Methane emission control requirements are gradually tightened | Methane emission control requirements are gradually tightened | Methane emission control requirements will not be further tightened, not expected to pose risks |
| | Enhanced emissions-reporting obligations | Environmental disclosure requirements | Environmental disclosure requirements become significantly tighter | Environmental disclosure requirements gradually become tighter | Environmental disclosure requirements will not be further tightened, not expected to pose risks |
| Technology | Unsuccessful investment in new technologies | R&D costs for low-carbon technologies | Significant increase in low-carbon technology R&D costs | Gradual increase in low-carbon technology R&D costs | Slow increase in low-carbon technology R&D costs |
| Market | Changes in market demand | New market entrants | Significant increase in demand for carbon-neutral LNG and new energy development | Increase in demand for carbon-neutral LNG and new energy development | Slow increase in demand for new energy development |
| Reputation | Increased stakeholder concern or negative stakeholder feedback | Stakeholder awareness of environmental issues | Significant increase in stakeholder awareness of environmental issues | Gradual increase in stakeholder awareness of environmental issues | Slow increase in stakeholder awareness of environmental issues |

¹⁷ Short for "Nationally Determined Contributions", referring to countries' self-defined pledges under the Paris Agreement, detailing what they need to do, and focusing on capabilities in areas such as mitigation, adaptation, finance, technology transfer, and capacity building.

Driving Factors for Transition Opportunities under Different Scenarios

| Transition Opportunities | | Drivers | Low-emission scenario | Baseline-emission scenario | High-emission scenario |
|--------------------------|-------------------------------------|--------------------------------|---|---|--|
| Opportunity category | Opportunity sub-category | | | | |
| Products and services | Development of natural gas business | China's natural gas usage | China's natural gas usage continues to decline, down by 55% in 2050 over the 2021 level | China's natural gas usage continues to grow, plateaus in 2040 and then starts to decline, with natural gas accounting for 14.5% and 10% of energy consumption in 2030 and 2050 respectively | China's natural gas usage continues to grow, accounting for 14.9% and 15.3% of energy consumption in 2030 and 2050 respectively |
| | Expansion into new energy business | Renewable energy usage/ supply | Significant increase in renewable energy usage; by 2050, renewable energy will account for 90% of energy supply | Gradual increase in renewable energy usage; renewable energy will account for 18.07% and 53.19% of energy supply in 2030 and 2050 respectively | Slow increase in renewable energy usage; renewable energy will account for 15.5% and 31.76% of energy supply in 2030 and 2050 respectively |
| Resource efficiency | Increase in energy efficiency | Energy utilization efficiency | Significant increase in energy utilization efficiency | Gradual increase in energy utilization efficiency | Slow increase in energy utilization efficiency |

Appendix 3 Risk Assessment Indicators

Assessment Indicators of Physical Risks

| Risk category | Risk sub-category | Assessment dimension | Assessment indicators (measuring unit) | |
|-----------------------|---|---|--|--|
| Acute | Extreme heat | Likelihood | Average number of days exceeding 35° C (days/year) | |
| | | Impact | Severity | Average surface temperature during extreme heat (° C) |
| | | | Sensitivity | Whether the high temperatures would cause reduced or suspended production, lower work efficiency, personnel health issues, equipment damage or depreciation, or increased cooling costs, etc |
| | Adaptation | Whether resilience measures have been or are planned to be implemented to address this risk | | |
| | Extreme cold | Likelihood | Average number of days below -4° C (days/year) | |
| | | Impact | Severity | Average temperature during extreme cold (° C) |
| | | | Sensitivity | Whether the extreme cold would cause energy supply shortages, reduced or suspended production, lower work efficiency, personnel health issues, equipment damage or depreciation, or increased heating costs, etc |
| | Adaptation | Whether resilience measures have been or are planned to be implemented to address this risk | | |
| | Typhoon | Likelihood | Average number of days with maximum daily wind speeds exceeding Class 6 on the Beaufort scale (mean wind speed > 10.8m/s) as adopted by China Tropical Cyclone Data Center (days/year) | |
| | | Impact | Severity | Average wind speed of tropical cyclones (m/s) |
| | | | Sensitivity | Whether typhoons would cause energy supply shortages, reduced or suspended production, personnel health issues, equipment damage or depreciation, and significant increase in manpower and costs to cope, etc |
| | Adaptation | Whether resilience measures have been or are planned to be implemented to address this risk | | |
| Extreme precipitation | Likelihood | Average number of days with flood inundation depth/rainfall height exceeding 50mm (days/year) | | |
| | Impact | Severity | Average flood inundation depth/rainfall height (mm) | |
| | | Sensitivity | Whether extreme precipitation would cause energy supply shortages, reduced or suspended production, personnel health issues, equipment damage or depreciation, and significant increase in manpower and costs to cope, etc | |
| Adaptation | Whether resilience measures have been or are planned to be implemented to address this risk | | | |
| Chronic | Sea level rise | Likelihood | Probability of sea level rise occurring | |
| | | Impact | Severity | Sea level rise height (Δ m) |
| | | | Sensitivity | Whether sea level rise would cause reduced or suspended production, personnel health issues, equipment damage or depreciation, and significant increase in manpower and costs to cope, etc |
| | Adaptation | Whether resilience measures have been or are planned to be implemented to address this risk | | |
| | Global warming | Likelihood | Probability of global warming occurring | |
| | | Impact | Severity | Average surface temperature rise under global warming (Δ° C) |
| Sensitivity | | | Whether rising temperatures would cause reduced or suspended production, lower work efficiency, personnel health issues, equipment damage or depreciation, and higher cooling costs, etc | |
| Adaptation | Whether resilience measures have been or are planned to be implemented to address this risk | | | |

Assessment Indicators of Transition Risks/Opportunities

| Assessment dimension | Assessment indicators |
|----------------------|--|
| Likelihood | The probability of this risk/opportunity occurring |
| Impact | The amount of decrease in operating revenue and increase in operating costs caused by this risk; The amount of revenue increase and operating cost decrease caused by this opportunity |
| Adaptation | Whether resilience measures have been or are planned to be implemented to address this risk, or whether measures have been or are planned to be implemented to seize this opportunity |



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