



新奥天然气股份有限公司  
ENN Natural Gas Co., Ltd.

# Climate-Related Financial Disclosure Report

December 2023



# About this report

---

## Scope of this report

This report encompasses ENN Natural Gas Co., Ltd. (ENN-NG) and its subsidiaries.

## Data Source

All information and data herein are collected based on the Company's official documents, statistics, and financial reports, as well as ESG information compiled, summarised and reviewed by the Company. This report is published in Chinese and English, for any discrepancies between two versions, the Chinese version shall prevail. Unless otherwise specified, the currency unit is RMB.

## Reporting Framework

This report is prepared in accordance with the TCFD Recommendations, covering governance, strategy, risk management, metrics and targets.

## Note on Company Name

For ease of presentation and reading, ENN Natural Gas Co., Ltd. is hereinafter referred to as "ENN-NG", "the Company" or "We" in this report.

The entities mentioned in this report, such as "ENN Energy" and "Zhoushan LNG Terminal," are all subsidiary companies of ENN Natural Gas Co., Ltd. Among them, "ENN Energy" refers to ENN Energy Holdings Limited, while "Zhoushan LNG Terminal" refers to ENN (Zhoushan) Liquefied Natural Gas Co., Ltd.

## Availability

This report is available at the Company's website (<https://www.enn-ng.com/>).

## References

1. International Energy Agency (IEA), *World Energy Outlook 2023*, October 2023.
2. Task Force on Climate-Related Financial Disclosures (TCFD), *Recommendations of the Task Force on Climate-Related Financial Disclosures*, June 2017.
3. Intergovernmental Panel on Climate Change (IPCC), *AR6 Synthesis Report* March 2023.
4. World Resources Institute (WRI), *WRI Water Risk Atlas*.
5. World Resources Institute (WRI), *WRI Floods*.
6. Intergovernmental Panel on Climate Change (IPCC), *IPCC WGI Interactive Atlas*.
7. Climate Analytics, *Climate Impact Explorer*.
8. Hong Kong Exchanges and Clearing Limited (HKEX), *Climate-related Information Disclosure under an Enhanced ESG Framework*, April 2023.
9. International Sustainability Standards Board (ISSB), *International Financial Reporting Sustainability Standard 2 - Climate-related Disclosures*, July 2023.
10. Ministry of Ecology and Environment, *China's Policies and Actions on Climate Change Annual Report 2023*, October 2023.

# Content

About ENN-NG	02
Preface	03

## 01 Governance

Governance structure	06
Board oversight	07
Management Responsibilities	08
Climate-related incentives	09

## 02 Strategy

Climate strategy	12
Climate action	13
Response to climate-related risks and opportunities	14

## 03 Risk Management

Climate-related risk identification and assessment	36
Climate risk management	39

## 04 Metrics and targets

Greenhouse gas emissions metrics and targets	44
--	----

Outlook	45
---------	----



# About ENN-NG

As one of the largest private energy companies in China, ENN Natural Gas Co., Ltd. (ENN-NG, stock code 600803.SH) operates 254 city gas projects nationwide in over 20 provinces and autonomous regions, running the first large-scale private LNG terminal in China -- Zhoushan LNG Terminal. Its business layout covers the entire natural gas value chain, including distribution, trading, storage and transportation, production, and engineering.

ENN Group adheres to the concept of green development, fully aligning with the national "3060" dual-carbon goals and energy transition strategy. The Company actively fulfils its

low-carbon emission obligations, committing to peak carbon emissions by 2030 and achieving carbon neutrality by 2050. ENN Group incorporates "sustainable development" into its corporate development blueprint, embracing a green development philosophy that emphasizes long-term, stable, and sustainable growth. Building on its achievements in reducing carbon emissions within its own operations, ENN Group aims to provide customers with smart technology-driven green solutions, empowering the entire industry value chain's transition to green and low-carbon practices and facilitating industrial intelligence upgrades.



ENN Natural Gas Co., Ltd has been disclosing climate information through the CDP Global Environmental Disclosure Platform since 2022 and submitted the CDP Climate Change Questionnaire for two consecutive years, further strengthening the Company's commitment to environmental information transparency.

# Preface

Climate change has already had widespread and profound impacts on the ecological environment, society, and the economy. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report points out that the negative effects and risks of climate change are becoming increasingly significant, with severe heatwaves, intense rainfall, other extreme weather events, and various disasters occurring more frequently. According to the International Energy Agency (IEA) World Energy Outlook 2023, the strong momentum of the clean energy transition is expected to peak global coal, oil, and natural gas demand before 2030.

To achieve the goal of limiting the global average temperature rise to within 2° C and striving to limit it to 1.5° C, major global economies are continuously increasing their support for clean energy. Against the backdrop of global efforts to address climate change and build a resilient energy system, China, as the world's largest developing country and a major energy consumer, has actively participated in global climate change governance. China officially proposed the "dual-carbon" goals in September 2020, aiming to peaking carbon emissions by 2030 and achieving carbon neutrality by 2060. Subsequently, the government initiated the development of the top-level design framework for the goal, constructing a "1+N" policy system. This effort is intended to advance comprehensive green transformation, reduce carbon emissions in an orderly and secure manner, and strengthen the implementation of responsibilities. In June 2022, 17 ministries jointly issued the "National Climate Change Adaptation Strategy 2035," outlining key tasks for climate change monitoring and warning, risk management, enhancing the adaptability of natural ecosystems, and strengthening the adaptability of economic and social systems to climate change, and providing comprehensive planning for climate change adaptation work from now until 2035.

As one of China's largest private energy enterprises, ENN-NG officially released the Green Action Plan 2030 Panorama and net-zero emissions roadmap in March 2022. ENN-NG aims to reduce its own emissions through energy conservation, energy structure reform, development of renewable energy, and green technological processes. As a responsible, intelligent and ecological operator in the natural gas industry, ENN-NG has deeply integrated the concept of sustainable development into its corporate development strategy. It provides customers with green energy solutions supported by smart technologies, collaborates with customers to build a green ecosystem, and strives to contribute to the green and low-carbon development of the natural gas industry. By the end of 2022, ENN-NG's carbon emission intensity had decreased by 28.3% year-on-year, and comprehensive energy consumption intensity had decreased by 20.4% year-on-year, helping society and users reduce emissions by 52.88 million tons.

Since 2020, ENN-NG has been publishing annual Environmental, Social, and Governance (ESG) reports to address the concerns of various stakeholders regarding sustainable development issues. In 2021, the Company made a climate commitment to peak carbon emissions by 2030 and achieve carbon neutrality by 2050. To further enhance information transparency and respond to the increasing focus of capital markets and stakeholders on climate risks, in 2023, ENN-NG conducts an assessment on climate-related risks and opportunities, referring to the Task Force on Climate-Related Financial Disclosure (TCFD). It identifies key risks and opportunities, formulates corresponding measures, and further improves metrics and targets management.

This report is ENN-NG's first independent report prepared in accordance with TCFD recommendations. Its purpose is to showcase ENN-NG's robust capacity and effective strategic layout to respond to climate change risks and energy structure transformation. It demonstrates the Company's determination to seize the medium and long-term opportunities for green development while responding promptly to the requirements from current capital market and stakeholders regarding climate-related financial disclosure.



# Governance

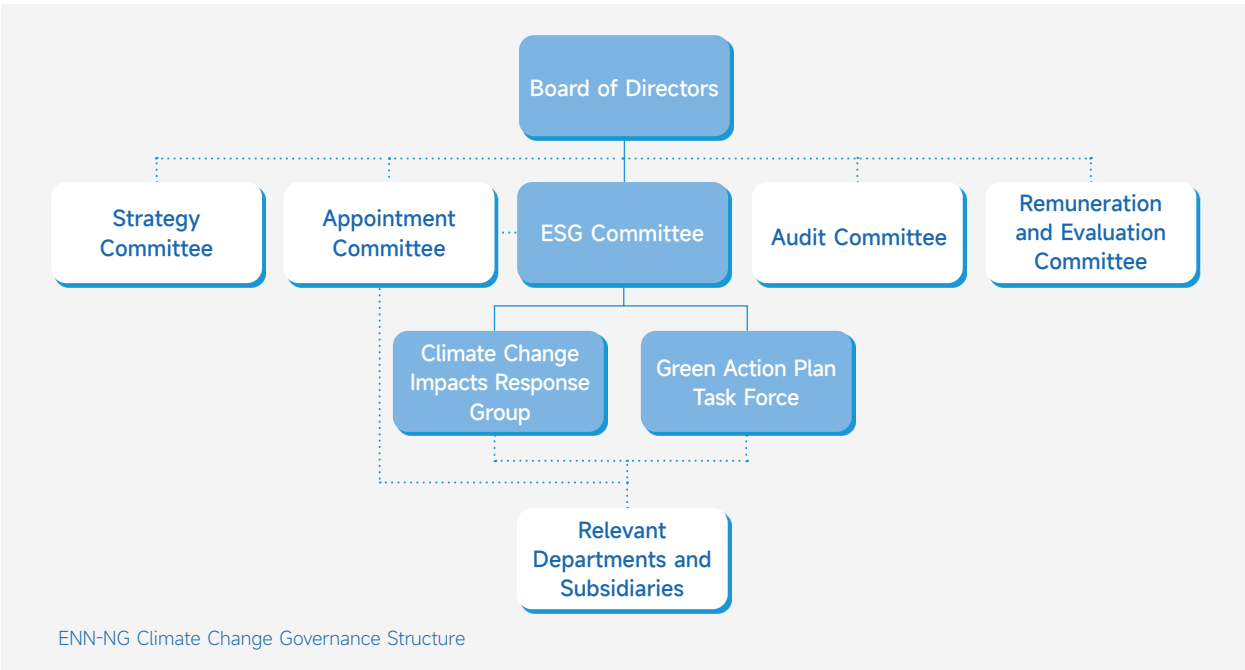


ENN-NG deeply recognizes the impact of climate change on its strategic planning and business operations, incorporating climate governance as a crucial component of the Company's overall Environmental, Social, and Governance (ESG) framework. To effectively manage climate risks and seize opportunities, ENN-NG has established and continuously refined its climate governance organizational structure. Climate-related indicators have been integrated into the compensation system to provide ongoing monitoring and incentives.



# Governance structure

At the board level, ENN-NG has established an ESG Committee to support the board in overseeing climate change related matters and collaborates with the Strategic Committee to incorporate climate risks and opportunities into the Company's strategic planning. To implement climate-related initiatives and specific indicators, the ESG Committee has established a Climate Change Impact Response Working Group and a Green Action Plan Special Working Group, coordinating with relevant departments and subsidiaries.



# Board oversight

- ◆ The board is the highest responsible body for addressing climate change related matters at ENN-NG, with the ESG Committee, led by the Vice Chairman and Co-CEO. It is responsible for overseeing and reviewing the Company's strategies and plans for addressing climate change, monitoring climate risk management progress and reviewing climate-related performance targets and incentive mechanisms.
- ◆ ENN-NG has enacted the "Rules of Procedure for the Board Environmental, Social, and Governance Committee", which sets out the composition, responsibilities, decision-making processes, and procedural rules of the ESG Committee at the institutional level.
- ◆ The Company holds ESG Committee meetings at least bi-annually to discuss climate change related matters, including progress toward targets and risk management.



ENN-NG continues to deepen its presence in the energy sector, with the Company's directors possessing extensive experience in the energy industry. Currently, ENN-NG has four directors with the capability to address climate-related issues, showcasing rich expertise in green energy and gas business investments, mergers and acquisitions, and operational management. Moreover, the Company consistently enhances the ability of its board members to identify and assess climate risks and opportunities. Since 2022, eight specialised training sessions and exams have been conducted for the board members and senior management team, covering topics such as equity incentives in listed companies, risk management, cases of legal violations in listed companies, climate change response, TCFD climate risks and opportunities workshops, and ESG seminars. The total training duration exceeded 300 hours.



Composition of ENN-NG's Board ESG Committee Members



# Management responsibilities

The ESG Committee establishes specialized working groups to actively promote climate risk management. These include the Climate Change Impact Response Working Group and the Green Action Plan Special Working Group, responsible for the climate scenario analysis and risk management, and climate actions and targets monitoring within the Company, respectively. The heads of relevant departments and subsidiaries are responsible for specific climate-related indicators and the concrete measures of the Green Action Plan.

### Climate Change Impact Response Working Group

- ◆ Conduct climate scenario analysis.
- ◆ Analyse and quantify relevant risks.
- ◆ Enhance climate risk management policies.
- ◆ Organize climate change response training.
- ◆ Establish comprehensive mechanisms and emergency management systems for climate risks.
- ◆ Regularly report progress to the board and adjust strategies.

Composed of department heads from Finance and Value-creation Operations, Customer Perception and Product Development, QHSE (Quality, Health, Safety, Environment), Risk-prevention Facilitator, and Investor Relations departments.

### Green Action Plan Special Working Group

- ◆ Collaborate with relevant departments and subsidiaries to promote green action goals.
- ◆ Continuously monitor the Company's progress toward achieving the net-zero carbon emissions roadmap.
- ◆ Adjust indicators based on emission roadmap implementation to facilitate goal attainment.

Composed of department heads from Customer Perception and Product Development, Investor Relations, Natural Gas Supply Chain, Administration and Social Connections, Technology and Innovation, Infrastructure Operations, and Finance and Value-creation Operations departments.

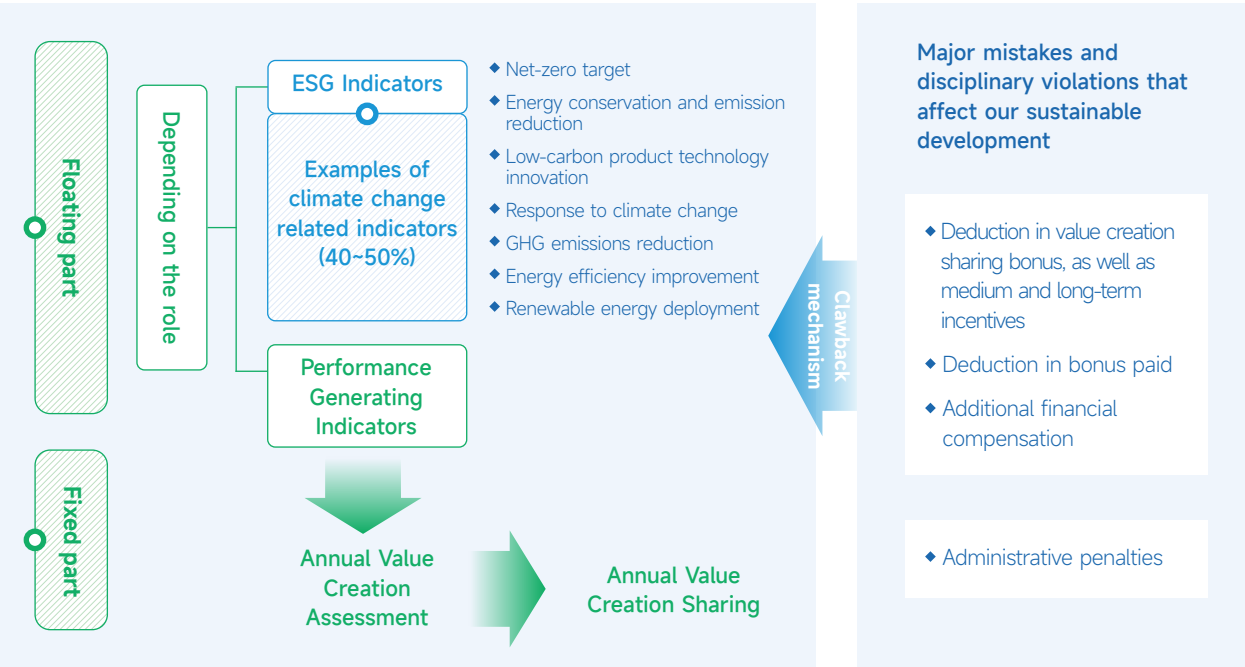
### Relevant Departments and Subsidiaries

- ◆ Implement climate change risk management measures in operational activities, incorporating transition risks into the business planning and management process.
- ◆ Implement specific initiatives outlined in the Green Action Plan, and energy-saving and emission reduction work plans.

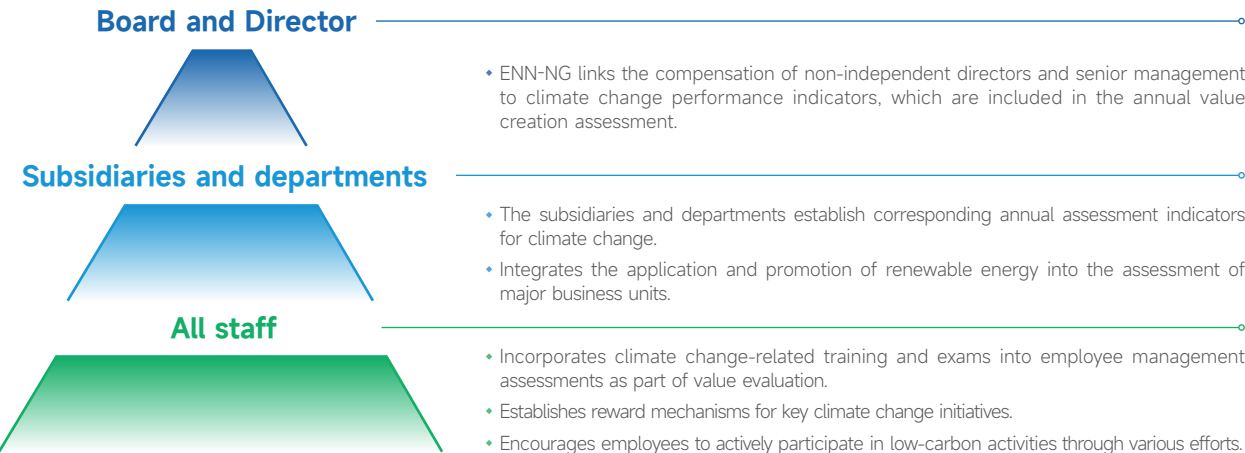
In 2022, the Climate Change Impact Response Special Team, directly led by the board, gradually completed quantitative analyses of climate-related risks and opportunities within various business units. Furthermore, ENN-NG has introduced the "ENN-NG Climate Change Policy," regularly reviewed and continually improved by the ESG Committee and ESG groups. This policy provides institutional safeguards for the management and emergency response mechanisms for various climate risks.

# Climate-related incentives

To ensure the comprehensive implementation of climate change governance, ENN-NG has formulated climate change indicators directly tied to compensation, aiming to enhance employee engagement in the Company's climate change initiatives through financial incentives. ENN-NG has instituted a clawback mechanism, which entails a series of measures and corresponding administrative penalties for individuals responsible for significant mistakes or violations adversely affecting the Company's sustainable development. This includes the deduction of value-sharing bonuses and mid-to-long-term incentives.



For all staff members, ENN-NG has taken the following incentives to encourage climate actions among staff:



# 02

## Strategy



# Climate strategy

As a leading private energy enterprise in China, ENN-NG integrates sustainable development concept into its core development strategy. In 2022, the Company unveiled "Green Action 2030 – ENN Journey to Net Zero", pledging to peak carbon emissions by 2030 and achieve carbon neutrality by 2050. The initiative includes specific short, medium, and long-term carbon reduction targets for key business segments, accompanied by the release of a comprehensive Green Action panorama and a roadmap for achieving net-zero carbon emissions.



Overall Climate Target of ENN-NG

Type of Targets	Coverage	Short-term target	Mid-term target	Long-term target	Progress Achieved in 2022
Scope 1&2 Emission	Natural gas production, import, and direct selling	By 2025, reduce the GHG intensity (total Scope 1 and Scope 2 emissions/sales revenue) by 20% from the 2020 baseline.	By 2030, reduce the GHG intensity (total Scope 1 and Scope 2 emissions/sales revenue) by 50% from the 2020 baseline.	Achieve carbon neutrality in own operations by 2050	The Company's own operational carbon emissions decreased by 200,000 tons of CO <sub>2</sub> equivalent compared to the previous year.
	Natural gas distribution	By 2025, reduce the GHG emission intensity (total Scope 1 and Scope 2 emissions/sales revenue) by 10% from the 2019 baseline.	By 2030, reduce the GHG emission intensity (total Scope 1 and Scope 2 emissions/sales revenue) by 20% from the 2019 baseline.		
	Integrated energy	/	By 2030, achieve a 48% reduction in carbon intensity from the 2019 baseline.	Achieve carbon neutrality in own operations by 2050	The carbon intensity of integrated energy business in energy production has decreased by 15%.

ENN-NG's climate targets for different business segments

# Climate actions

In pursuit of its Green Action Plan 2030 Panorama, ENN-NG has outlined action plans before carbon emission peaking for each business segment.

In 2022, ENN-NG not only implemented measures to enhance energy efficiency and promote the application of clean energy but also made significant strides in GHG emission management, including scope 3 carbon footprint assessment and methane reduction. Simultaneously, the Company emphasized the coordinated green development of its entire industry chain. Anchored in digital intelligence technology, ENN-NG continues to provide green, low-carbon energy products and solutions, thus empowering industrial sustainability.

Scope 1 & 2 Scope 3	Methane Emission	<ul style="list-style-type: none"><li>◆ Making every effort to recover boil-off gas (BOG) during storage, transportation, and distribution, minimizing the emissions and leaks of natural gas during engineering and operational activities.</li><li>◆ Widely adopting digital measures for real-time monitoring of methane emissions and enhance the reliability of monitoring data.</li></ul>
	Green Office	<ul style="list-style-type: none"><li>◆ Implementing energy-efficient measures for office buildings, including LED lighting upgrades and use of smart devices for intelligent energy management.</li><li>◆ Initiating low-carbon office initiatives, urging subsidiaries to promote low-carbon and energy-saving activities, with a target of over 90% coverage of environmental labels in offices.</li><li>◆ Promoting paperless office practices through document digitization and transitioning meetings to online formats.</li><li>◆ Gradually replacing non-production vehicles with new energy vehicles, utilizing connected vehicle products to enhance transportation efficiency.</li><li>◆ Continuously conducting carbon emission inventories in office scenarios, establishing a carbon credit trading system, and fostering a low-carbon culture.</li></ul>
	Clean Energy	<ul style="list-style-type: none"><li>◆ Increasing the proportion of renewable energy usage, maximizing the utilization of solar power on rooftops, car sheds, available ground areas, and the cooling energy resources of receiving stations during internal operations.</li><li>◆ Continuously enhancing the proportion of renewable and zero-carbon energy in integrated energy business operations for downstream customers.</li></ul>
	Low-carbon Product	Tailoring solutions for customers, offering diverse clean energy options, including carbon-neutral LNG, hydrogen, photovoltaics, and biomass.
	Digital Intelligence	<p>Building an intelligent platform for the natural gas industry, including the Great Gas, intelligent heating management, and comprehensive low-carbon smart efficiency solutions.</p> <p>Empowering customers to improve energy efficiency, to achieve low-carbon development across the industry chain.</p>

ENN-NG's climate actions for different business segments

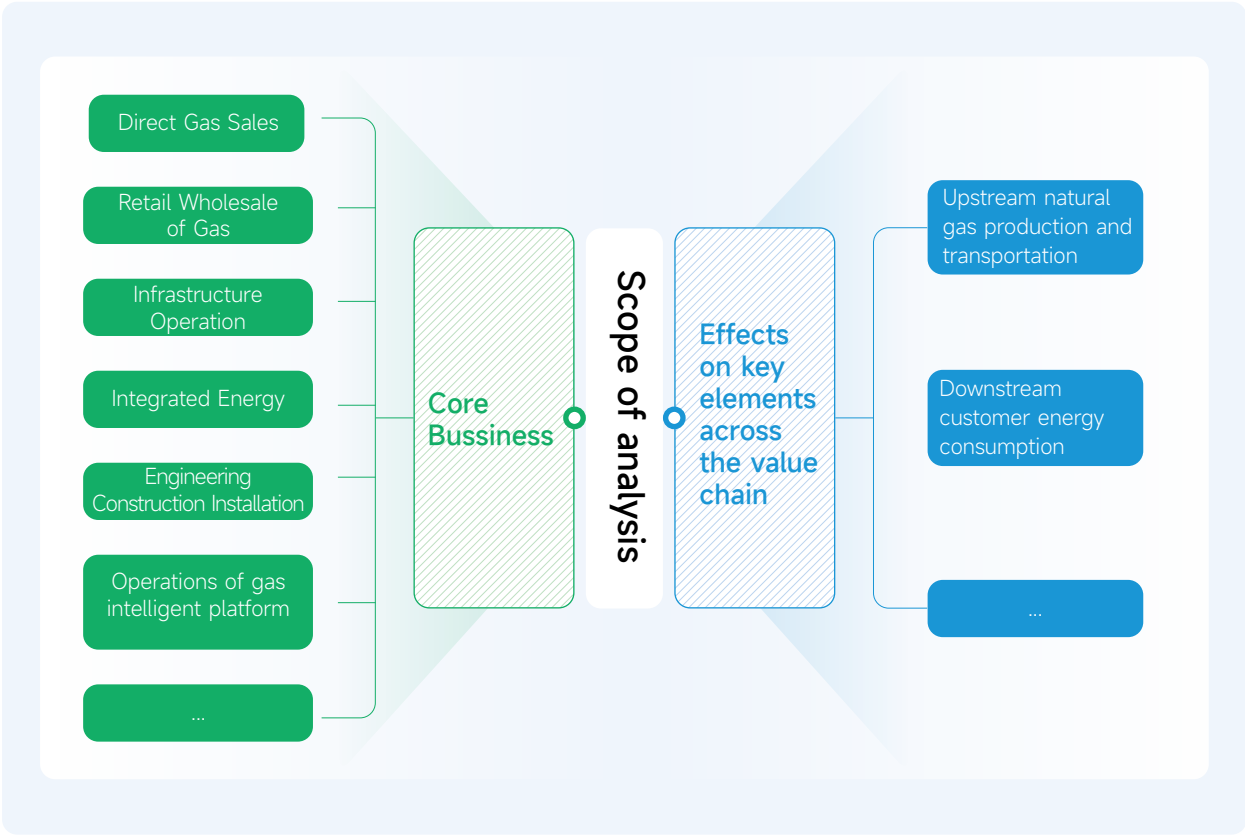
# Response to climate-related risks and opportunities

ENN-NG places high importance on climate risks, encompassing both physical risks from climate changes and extreme weather events, as well as transition risks arising from energy transformation, national "dual-carbon" goals, and climate-related policies. We recognize that while climate change poses risks, it also presents new business growth opportunities for the Company.

## Scope of analysis and climate scenario

### Scope of analysis

ENN-NG's climate risk identification and assessment cover its core businesses, including natural gas direct selling, distribution, infrastructure operations, integrated energy, engineering construction and installation, as well as emerging businesses such as the construction and operation of the natural gas industry intelligent platform. We not only consider the impact of climate change on ENN-NG's operational activities but also analyse its effects on key elements across the value chain, such as upstream natural gas production and transportation and downstream customer energy consumption.



### Timeframe

ENN-NG identifies and assesses short- and medium- to long-term climate risks and opportunities. The Company aligns risk management with its short-, medium-, and long-term strategic and action plans.

Impact Timeframe	Duration (year)	Note
Short term	0-3	In the short term, the Company reviews the Green Action 2030 every three years, adjusting carbon neutrality goals promptly and annually formulates and summarizes work plans.
Medium term	3-10	Aligned with the national goal of peaking carbon emissions by 2030, the Company takes 3-10 years as the time period of the medium-term plan, incorporating business types and emission reduction plans. It regularly reviews and revises business development as needed.
Long term	10-30	The Company is planning for the long-term on a time scale of 10-30 years, and based on the Green Action 2030, the progress of business development is regularly reviewed and revised as necessary.

To more effectively identify and assess the potential impacts of climate-related risks and opportunities, the Company incorporates climate scenario analysis into its process of climate-related risk identification and assessment. This approach allows the assessment of the impacts and trends of risks and opportunities under different climate scenarios over varying time frames. By doing so, the Company can formulate risk management strategies that are more forward-looking and resilient.

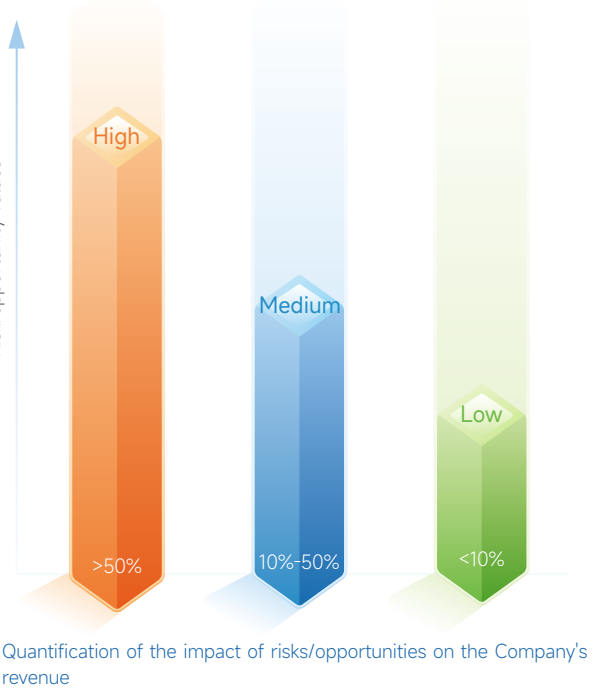
ENN-NG has selected internationally recognized climate scenarios to support the identification of climate risks and opportunities. Matching climate scenario parameters are chosen to conduct scenario analysis and financial quantification

assessments of the key risks and opportunities. Three distinct climate scenarios have been chosen for analysis: the current policy scenario, a high-emission scenario (brown scenario), and an accelerated transition scenario (turquoise scenario). These scenarios are utilized to analyse the risks and opportunities faced by ENN-NG under different conditions. In addition to the current policy scenario, acute and chronic physical risks under high-emission scenarios are carefully considered for their impacts. For transition risks, the focus is primarily on assessing the effects of changes in external factors such as policies, markets, and technologies under the accelerated transition scenario. Based on scenario parameters, the assessment of risks and opportunities is conducted considering dimensions such as likelihood, velocity, and financial impact.

**Likelihood:** The greater the consistency of results aligning across different scenarios and proximity, the higher the likelihood of the risk/opportunity materializing.

**Velocity:** The faster the change in the risk/opportunity from the baseline, the closer the occurrence is to the present.

**Financial Impact:** Calculated based on the negative effects of the risk on the Company's revenues or costs, and the positive effects of the opportunity on revenues or costs. When quantifying risk/opportunity values (Value-at-Stake, VaS), the computed results encompass both the gross risk value (Gross VaS) and the net risk value (Net VaS), which takes into account additional mitigation measures and actions implemented.





Climate scenarios adopted are listed in the table below.

Physical Risks Climate Scenarios					
Scenario Type	Selected Scenarios	Source	Temperature Rise Projection	Description	Climate Scenario Parameter Sources
Brown scenario/ high-emission scenario	RCP 8.5	Intergovernmental Panel on Climate Change (IPCC)	4°C	In the first scenario, a projected global temperature surge exceeding 4°C is anticipated to notably heighten physical risks. This projection is predicated on the assumption of ineffective climate and energy policies, contributing to a substantial escalation in global greenhouse gas emissions.	WRI Water Risk Atlas WRI Aqueduct Floods Climate Impact Explorer (CIE) The KNMI Climate Explorer
	Current policy scenario	IPCC	3°C	This is an intermediate scenario with a global temperature rise of more than 2°C and thus significant impacts on the global climate system. This scenario incorporates existing climate and energy policies, encompassing commitments outlined in nationally determined contributions (NDCs) that fall short of the targeted limitation on temperature rise within 2°C.	

Transitional Risk/ Climate Opportunities Scenarios					
Scenario Type	Selected Scenarios	Source	Temperature Rise Projection	Description	Climate Scenario Parameter Database
Turquoise scenario/ accelerated transition scenario	Net Zero by 2050 (NZE) / Sustainable Development Scenario (SDS)	IEA	1.5°C (<2°C for SDS)	This scenario is a desirable scenario that refers to success in achieving the goal of net-zero CO <sub>2</sub> emissions by around 2050 and limiting global warming to 1.5°C through rigorous climate policies and innovation. When climate parameters are not available for the NZE scenario, the SDS scenario may also be used to indicate success in limiting global warming to 2°C.	IEA-WEO
Current policy scenario	Stated Policies Scenario (STEPS)	IEA	3°C	The scenario reflects the current policy environment and is based on a case-by-case assessment of sector-specific policies, as well as policies that have been announced by Governments around the world. It provides a baseline for assessing the potential outcomes (and limitations) of recent developments in energy and climate policy.	

\*Temperature rise projection signifies the projected average increase in global surface temperature by 2100.

Physical risk

Physical risks refer to the impact on the operational development of ENN-NG brought about by changes in weather and climate conditions. These risks encompass acute physical risks (including floods, typhoons, heatwaves, wildfires, etc.) and chronic physical risks (including temperature rise, sea level rise, changes in precipitation patterns, droughts, water scarcity, etc.). ENN-NG has conducted a comprehensive risk screening for acute and chronic physical risks at all operational points, identifying high-risk areas and analysing the financial impact of key physical risks on ENN-NG. The main physical risks are shown in the table below.

Risk Type	Risk Element	Risk Description	Impact on Value Chain	Impact Period	Financial Impact	Measures
Acute Risk	Typhoon	<ul style="list-style-type: none"><li>More frequent typhoons impact the normal operations of coastal operational sites.</li><li>Logistics delays and facility shutdowns at the Zhoushan receiving station and coastal natural gas direct sales, distribution, and integrated energy operational points result in reduced company revenue.</li></ul>	Operation	Short term	Revenue	<ul style="list-style-type: none"><li>Conduct risk assessments for transportation routes and port selection, making adaptive adjustments to reduce potential impact areas and facilities.</li><li>Strengthen hydraulic engineering measures and implement flood control measures in risk-prone areas.</li><li>Utilize intelligence platforms such as the Great Gas and safety digitalization platform for early risk warnings and resource allocation.</li></ul>
	Flood	<ul style="list-style-type: none"><li>Floods damage natural gas transport pipelines and facilities, leading to asset losses and increasing maintenance costs.</li></ul>	Operation	Short term	Cost & Asset	<ul style="list-style-type: none"><li>Develop flood emergency plans and lightning emergency plans.</li><li>Adopt more robust facility and pipeline designs, constructing a circular pipeline network to effectively prevent overall damage to the natural gas pipeline network caused by localized disruptions.</li><li>Implement real-time online monitoring of third-party projects along the pipeline to promptly address safety hazards.</li></ul>
	Heatwave	<ul style="list-style-type: none"><li>Heatwaves affect outdoor workers (such as patrolmen, gas refuellers, and other workers), leading to reduced working hours.</li><li>Increased operating costs on high temperature subsidies, expenditures on working environment improvements, and the purchase of protective equipment, among other expenses.</li></ul>	Operation	Short term	Cost	<ul style="list-style-type: none"><li>Develop heatstroke emergency plans.</li><li>Enhance measures for heatstroke prevention and cooling for employees, providing adequate drinking water and medical support.</li><li>Allocate construction time effectively to avoid the impact of high temperatures on construction progress.</li></ul>
Chronic Risk	Average temperature rise	<ul style="list-style-type: none"><li>Rising average temperatures reduce natural gas demand in winter, affecting natural gas business revenue.</li></ul>	Downstream	Long term	Revenue	<ul style="list-style-type: none"><li>Utilize smart monitoring systems, develop a "market intelligence" platform for real-time monitoring of parameters such as temperature and pressure, integrate data from the natural gas industry chain, and create intelligent prediction tools.</li><li>Upgrade the business structure by adding renewable energy supply services.</li><li>Proactively explore and expand hydrogen energy business.</li></ul>

Key physical risks on ENN-NG

Analysis of Key Physical Risks

Climate Scenario Analysis and Parameters Selection

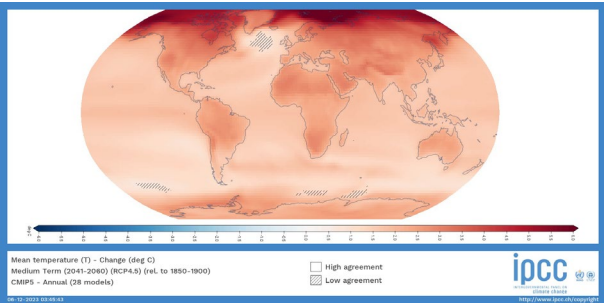
To assess the impact of physical risks, we have chosen two climate scenarios, namely RCP 4.5 and RCP 8.5. These scenarios represent two distinct developmental trends in global greenhouse gas emissions. RCP 4.5 reflects a relatively moderate scenario, with emissions peaking around 2040 and subsequently declining. On the other hand, RCP 8.5 represents a more extreme scenario, with emissions continuing to rise throughout the 21st century, adopting a business-as-usual (BAU) scenario as the baseline. To reflect the effects of rising average temperatures, we have selected near-surface temperatures from the IPCC WGI Interactive Atlas as a parameter.



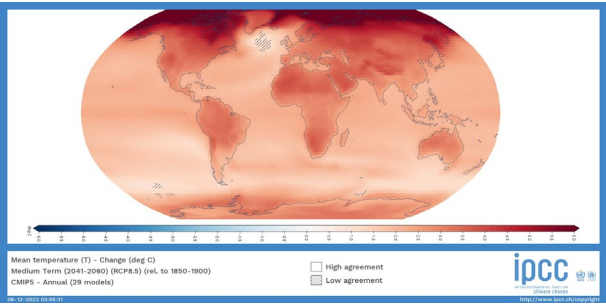
Risk Name Declining Demand for Natural Gas due to Increased Average Winter Temperatures

Risk Description

Global warming will cause the increase of average temperature, meanwhile the winter temperature in China will rise. Escalating global temperatures could curtail the demand for natural gas heating during winters, potentially leading to reduced natural gas sales for ENN-NG and consequently impacting the Company's revenue.

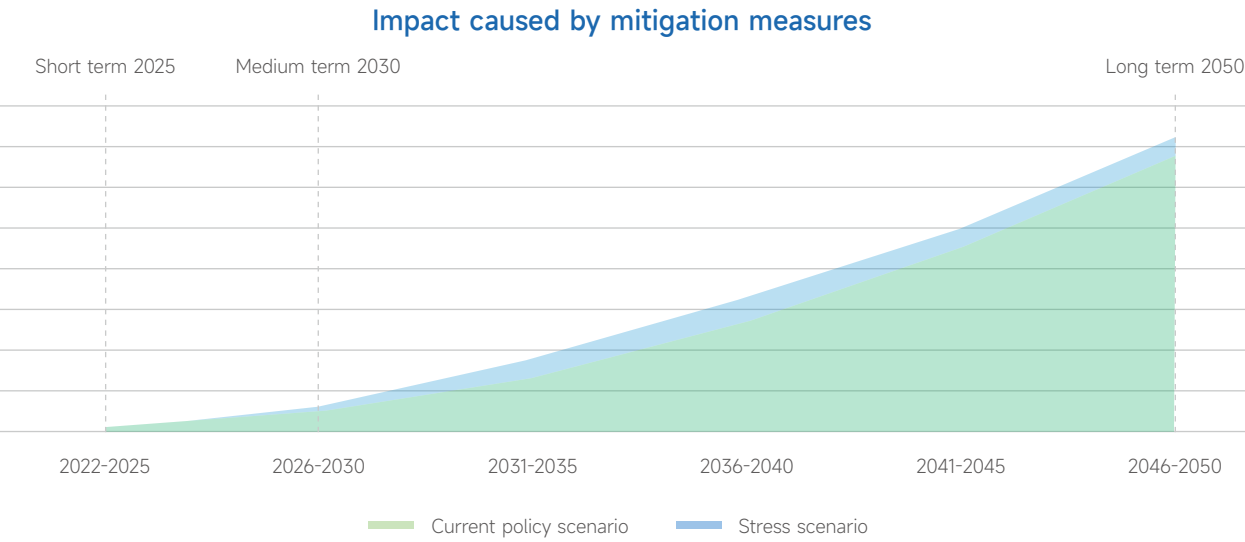
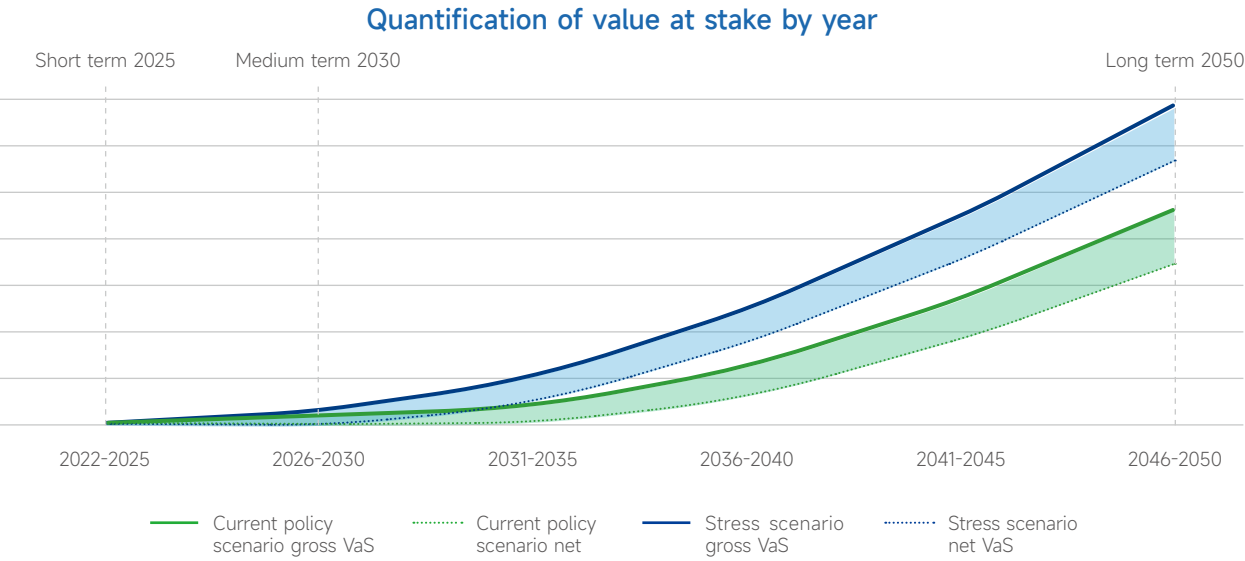


IPCC RCP 4.5



IPCC RCP 8.5

Financial Impact Results	Value at Stake (VaS)	Scenario	Risk Level
Likelihood: medium	Gross VaS	current policy scenario	Low (<10%)
Velocity: short-term	Gross VaS	stress scenario	Low (<10%)
	Net VaS	current policy scenario	Low (<10%)
	Net VaS	stress scenario	Low (<10%)



\*Net risk = total risk - mitigation measures, negative mitigation measures impact is due to upfront capital inputs

## Risk Response Measures

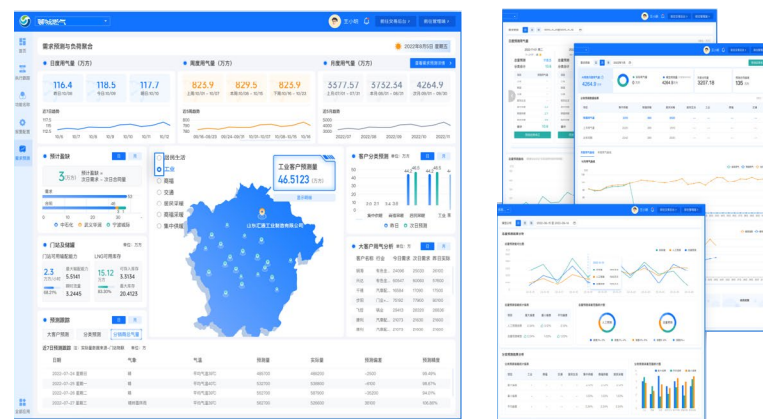
## Enhancing Demand Forecasting, Early Warning, and Intelligent Deployment

ENN-NG has established the digital management system, the energy and carbon digital platform, and the smart energy management platform for intelligent demand forecasting. The ENN-NG Natural Gas Industry Intelligent Platform, the Great Gas, provides services such as demand prediction and intelligent gas delivery. It monitors and manages natural gas inventory in real-time, supporting distributors in resource procurement and allocation with data, meeting flexible gas usage needs. In 2022, mathematical forecasting models were developed to predict the impact of temperature changes on natural

gas demand. This involved model training and optimization through historical data analysis, factors analysis, meteorological temperature forecasts, and IoT data verification. The accuracy of the demand forecasting model was continuously improved. Intelligent predictions of natural gas demand changes due to temperature fluctuations were made, enabling timely risk warnings and the implementation of measures to adjust gas reserves and dispatch scheduling. This effort aimed to enhance energy management efficiency and strengthen risk response capabilities.

## Natural Gas Industry Intelligent Platform – The Great Gas Empowering Supply-Demand Balance through Intelligent Demand Forecasting

Based on real-time data from IoT meters and leveraging historical gas consumption data, various predictive models are developed by considering factors such as temperature, meteorological conditions, holidays, customer production schedules, maintenance plans, and alternative energy sources. Additionally, different gas-consuming customer categories, including residential, commercial, transportation, and industrial, are taken into account. Ultimately, this process aggregates gas load forecasts for different periods (daily, weekly, monthly, and yearly) and various customer categories. This data serves as a foundation for distributors to conduct resource procurement, demand-supply balancing, and resource allocation.



### City gas - demand projection

## Daily/Monthly Rolling Forecasts

Daily gas volume forecasts for the current month are generated, and by combining the actual gas consumption that has occurred, a rolling forecast for the total demand of the month is made. This allows for a timely identification of resource surplus or shortage, enabling resource reallocation in comparison to contracted volumes.

## Customer Segmentation Forecasting

Drawing from the manual forecasting methods employed by urban gas enterprises in cities such as Changsha and Shijiazhuang, the best offline practices are accumulated. By integrating these practices with pipeline models, the capability for heating classification forecasting is established.

## Manual Adjustment + Model Prediction

Business personnel adjust the impact values on the total urban gas caused by planned customers, new users, and major unforeseen events based on experience. Through a combination of model predictions and manual adjustments, influencing factors are solidified.

## Deviation Analysis

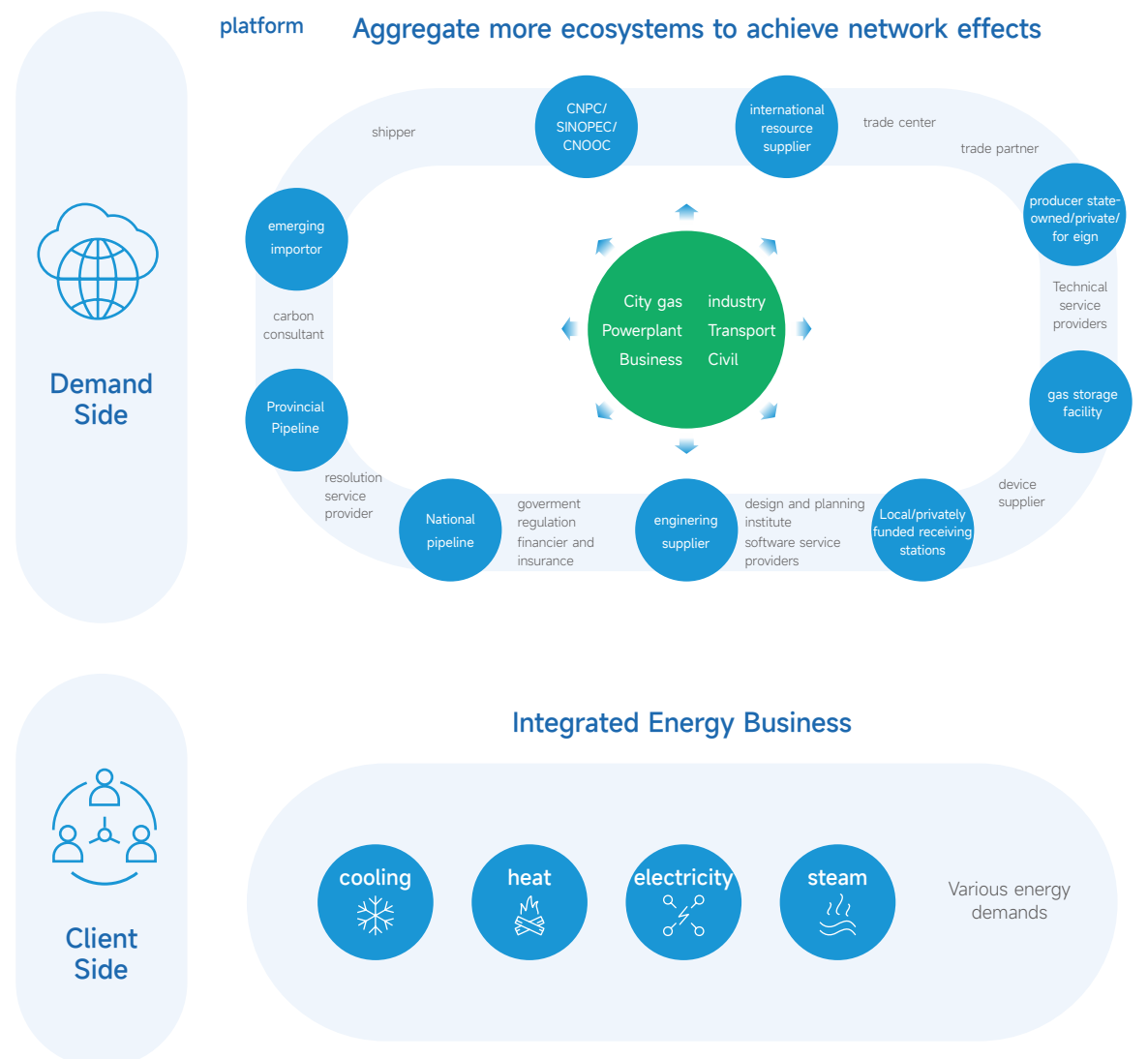
During the gas consumption process, deviations between predicted and actual gas volumes are observed. An analysis of the reasons for these deviations is conducted, and continuous model optimization is carried out.

## Product Capacity

## Expanding Business Scenarios to Meet Diverse Energy Needs

To address the changes in natural gas heating demand resulting from rising temperatures, ENN-NG actively expands diverse natural gas application scenarios and clientele. This includes offering integrated energy solutions to meet customers' various energy needs, such as heating, cooling, electricity, steam, and more. Additionally, the Company seizes opportunities in the growing market for industrial coal-to-gas conversion, gas-fired power generation, and other incremental markets to expand its natural gas business.

## The Great Gas Aggregates Ecosystem, Expanding Diverse Natural Gas Application Scenarios and Customers





Transition risk

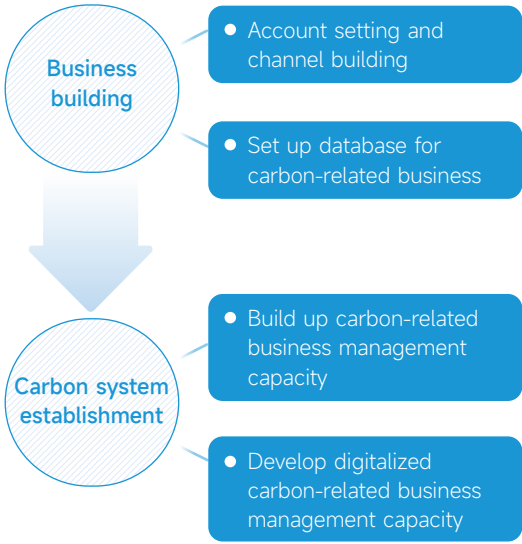
Transition risk refers to the risks associated with the policy, legal, technological, and market changes that occur as society undergoes the transition to a low-carbon economy to mitigate and adapt to climate change. ENN-NG has

conducted a detailed analysis of four types of risks: policy and regulatory risks, technological risks, market risks, and reputation risks. The primary transition risks are outlined in the table below.

Risk Type	Risk Element	Risk Description	Impact on Value Chain	Impact Period	Financial Impact	Measures
Transition Risk	Market risks	<ul style="list-style-type: none"><li>The rising prices of fossil fuels such as diesel and natural gas may result in increased transportation costs for tanker trucks, leading to higher logistics expenses for LNG transport and other transportation costs for owned vehicles and vessels.</li></ul>	Operation	Mid-term	Cost	<ul style="list-style-type: none"><li>Gradually replace non-production vehicles with new energy vehicles.</li><li>Rely on intelligent technologies to develop connected vehicle products, significantly improving vehicle operational efficiency.</li></ul>
	Policy and regulatory risks	<ul style="list-style-type: none"><li>As the coverage of the carbon market gradually expands and emission quotas tighten, ENN-NG's direct compliance costs are expected to increase.</li><li>The inclusion of the power industry in the carbon market may lead to a rise in electricity prices, indirectly increasing ENN-NG's operational costs.</li><li>Additionally, the potential inclusion of the steel and building materials industry in the national carbon market could raise the costs of the engineering and construction business in the future.</li></ul>	Operation; Upstream	Mid-term	Cost	<ul style="list-style-type: none"><li>Monitor the progress of carbon market laws and regulations, incorporating them into the risk assessment process, and establish a two-tier risk management system with headquarters supervision and control by energy management departments in various subsidiaries.</li><li>Continuously promote self-owned building photovoltaic power generation, achieving a self-owned building photovoltaic installed capacity of 4.25 MW in 2022, covering distributed photovoltaics in over 50% of its own office operating locations.</li><li>Explore the use of solar resources and cold energy resources at receiving stations for photovoltaic and cold energy power generation within various plant areas.</li></ul>
	Policy and regulatory risks	<ul style="list-style-type: none"><li>To achieve the 55% emission reduction target by 2030, the European Union has introduced new regulations to include the shipping industry in European Union Allowance (EUA). Ships entering EU ports are required to annually pay a sufficient amount of carbon allowances; otherwise, they may face a fine of 100 euros per ton or be prohibited from sailing.</li></ul>	Operation Downstream	Short-term	Cost	<ul style="list-style-type: none"><li>Keep a close eye on changes in the EU Emissions Trading Scheme (ETS), comprehensively build carbon business management capabilities, open up related channels, cultivate professional talents, and proactively address carbon tax risks.</li></ul>
	Policy and regulatory risks	<ul style="list-style-type: none"><li>The national 30·60 climate targets drive the transformation of the energy structure, increasing the proportion of non-fossil energy sources such as wind, solar, hydropower, nuclear, and biomass.</li><li>In the long term, the proportion of fossil energy sources in the energy structure is expected to decrease, impacting the revenue and sustainable operation of natural gas-related businesses.</li></ul>	Downstream (client demand)	Long term	Revenue	<ul style="list-style-type: none"><li>Develop integrated energy businesses, promote the use of new energy and renewable energy, and provide downstream customers with a more diverse range of green and low-carbon products.</li><li>Invest in and conduct research and development on new technologies such as hydrogen, including coal-based hydrogen production, natural gas-based hydrogen production, and water electrolysis for hydrogen production.</li><li>Explore cutting-edge low-carbon technologies such as energy storage, CCUS (carbon capture, utilization, and storage), geothermal, etc.</li></ul>

ENN-NG Proactively Addresses Risks of International Maritime Carbon Tax, Aligning with EU Policies

- Opening carbon trading accounts with counterparts to facilitate the purchase of carbon allowances.
- Setting up settlement accounts in the EU to streamline the process of remitting carbon taxes.
- Monitoring global market risks and integrating carbon-related business into a 24-hour global coordination management system.
- Acquisitioning timely information and leveraging the advantageous location of the London office to immerse in the local carbon market, and ensuring access to firsthand information and data.
- Establishing EUA management capability, developing the capability to manage EUAs, connecting international trade, shipping, carbon taxation, and settlement processes for comprehensive carbon management and implementing a daily reporting mechanism.
- Evaluating the potential impact of the Carbon Border Adjustment Mechanism (CBAM), systematically assessing its influence on customers, and formulating carbon-supportive products.
- Utilizing ETMO as the central hub to build digital capabilities and systems for carbon risk control, addressing industry gaps proactively.

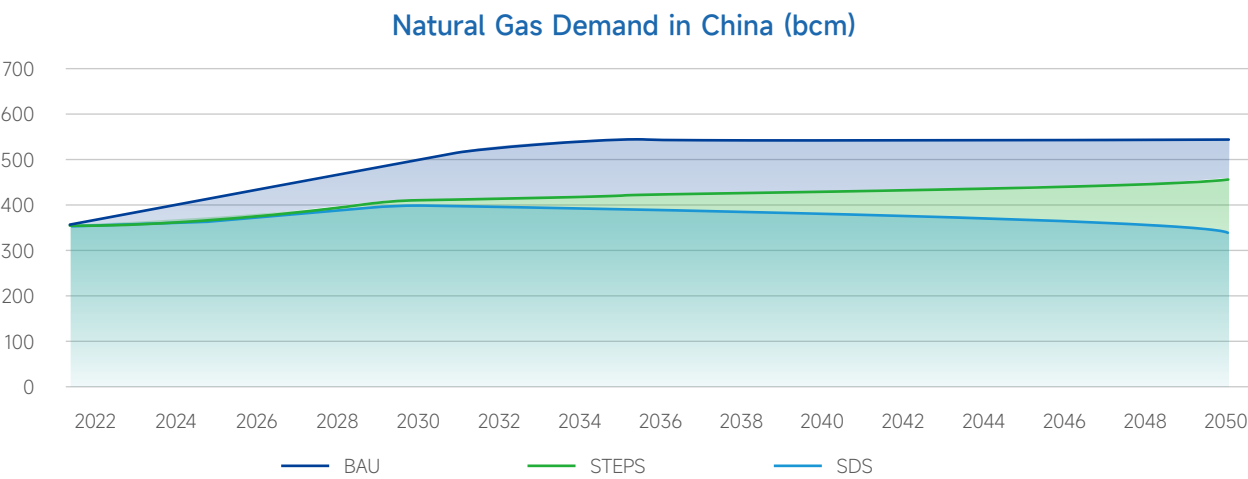


Analysis of Key Transition Risks

Climate Scenario Analysis

In order to better assess the long-term impact of this transition risk on ENN-NG's revenue, the International Energy Agency's Stated Policies Scenario (STEPS) and Sustainable Development Scenario (SDS) from the *World Energy Outlook*

2021 are selected. The Business-as-Usual Scenario (BAU) is used as a baseline to evaluate how these external driving factors will affect ENN-NG's revenue from natural gas sales.



Risk Name

Gradual Replacement of Natural Gas by Clean Energy in the Energy Structure Transformation

Risk Description

With the promotion of China's "dual-carbon" policy, the transformation of the energy mix will be further accelerated, and the proportion of non-fossil energy sources such as wind power, solar power, hydropower, nuclear and biomass will increase, while the proportion of natural gas in the energy structure will decrease in the long term. In 2022, 79.56%

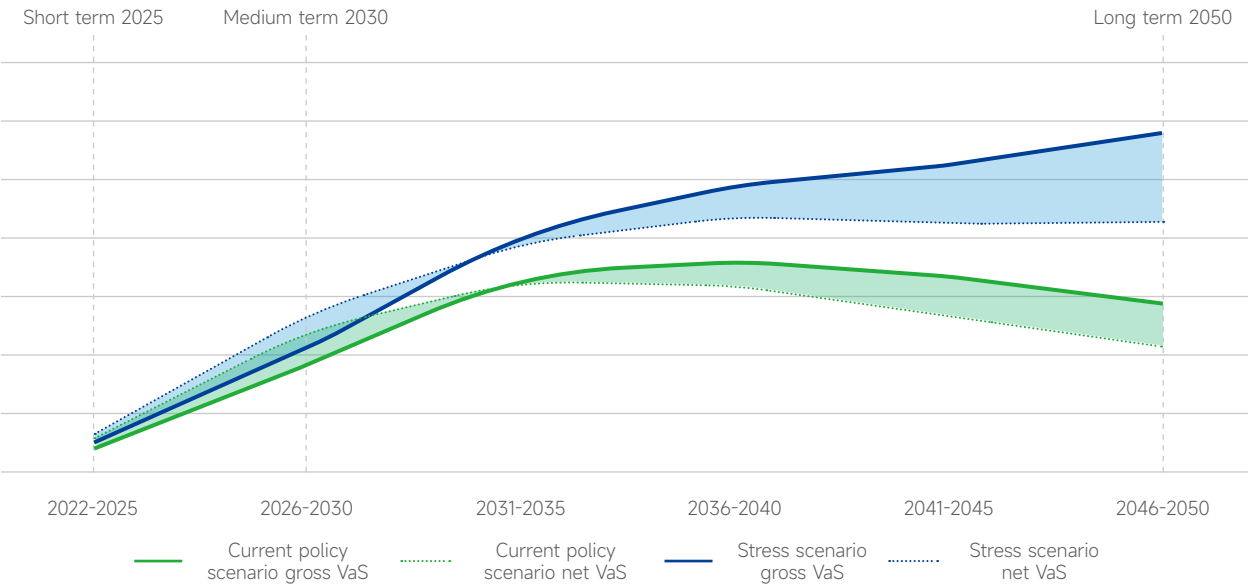
of ENN-NG's revenue is derived from its natural gas sales business. Anticipated future reductions in natural gas demand could pose systemic risks to the sustainability development of ENN-NG's natural gas direct selling and distribution, potentially affecting the Company's future revenue.

Financial Impact Results	Value at Stake (VaS)	Scenario	Risk Level
	Gross VaS	current policy scenario	Med (10-50%)
	Gross VaS	stress scenario	Med (10-50%)
	Net VaS	current policy scenario	Med (10-50%)
	Net VaS	stress scenario	Med (10-50%)

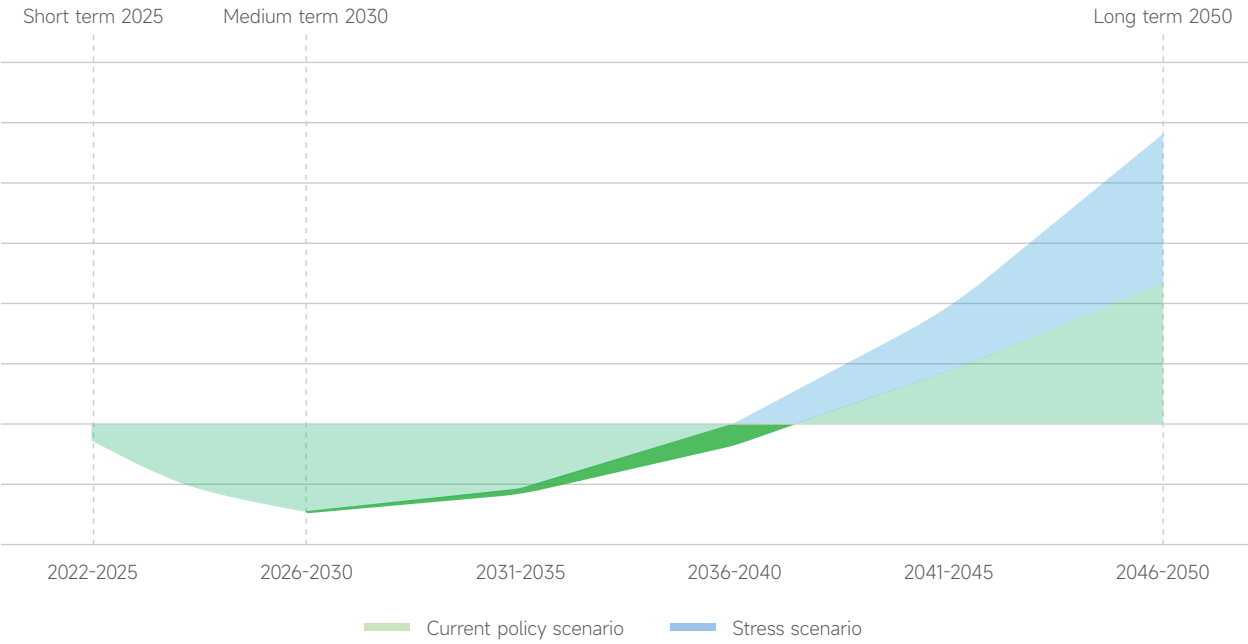
Likelihood: medium

Velocity: short-term

Quantification of value at stake by year



Impact caused by mitigation measures



\*Net risk = total risk - mitigation measures, negative mitigation measures impact is due to upfront capital inputs



Risk Response Measures

Expand Multiple Clean Energy Sources, Build Smart Low-Carbon Solutions

ENN-NG uses integrated energy digital technology as the service foundation to create intelligent low-carbon solutions that prioritize clean energy and offer a variety of complementary energies tailored to customer and industrial park needs. This includes carbon-neutral liquefied natural gas (LNG), hydrogen, photovoltaics, biomass, and other clean energy sources.

ENN Energy's Tailored Approach to Integrated Energy Business

The Company adopts a localized strategy for the development of integrated energy businesses. Based on local energy resources and customer needs, it actively applies and integrates various clean energy sources, including natural gas, industrial waste heat and biomass, solar energy, geothermal, etc. Tailored multi-energy complementary integrated energy solutions are designed to meet the diverse energy needs of various users.

Simultaneously, the Company has formulated a green development plan for integrated energy businesses, outlining quantifiable goals such as increasing the proportion of renewable energy, improving system efficiency, and considering the adoption of CCUS technology to further meet customers' low-carbon energy needs. Specific measures include:

- Adjusting the energy structure: Gradually increasing the installed capacity of photovoltaics, raising the proportion of biomass and geothermal in the energy structure, and considering the

introduction of hydrogen utilization in the integrated energy ecosystem after 2025. By 2030, the proportion of renewable energy in the energy structure is targeted to increase to 36%.

- Improving system efficiency: Before 2030, enhancing the overall system efficiency of energy production facilities in integrated energy businesses through continuous technological upgrades, operational strategy optimization, and improvements in core technologies of smart energy management platforms. The aim is to achieve a 5% increase in system efficiency on the current base of approximately 90%.
- Natural gas decarbonization: In the short term, selecting pilot projects in well-performing operational areas of the gas company to implement CCUS projects by 2025. Gradually integrating CCUS technology into integrated energy businesses to offset 5% of carbon emissions from natural gas annually.



Increase R&D Investment in Clean Energy, Develop Hydrogen-related Businesses:

ENN-NG actively engages in the technological research and development and industrial application of hydrogen energy. The Company explores various hydrogen-related businesses, including hydrogen production from natural gas, natural gas reforming technology, water electrolysis for hydrogen production, hydrogen infrastructure construction, hydrogen blending in pipelines, etc. With 14 core patents already secured, the Company aims to provide more technological solutions for the hydrogen energy market. Simultaneously, the Company will continue to invest in exploring other low-carbon technology research and development, including carbon neutrality throughout the LNG lifecycle, dry biomass natural gas technology, solid oxide fuel cells, carbon dioxide capture, utilization, and storage (CCUS), among others.

Jiangsu Taixing Pipeline Hydrogen Blending Project

The project is located in the Taixing Economic Development Zone and involves the technological transformation of the existing natural gas pipeline in the Taixing Economic Development Zone to blend hydrogen for carbon reduction. The project includes the Northeast Pressure-Regulating Metering Station of New Puolefin (Taixing) Co., Ltd., the Northwest Pressure-Regulating Metering Station of Jiangsu Yanchang Zhongran Chemical Co., Ltd., the intermediate-pressure natural gas pipeline, hydrogen pipeline, and the medium-pressure gas pipeline in the Taixing Economic Development Zone's original natural gas pipeline hydrogen blending and carbon reduction technology transformation project. The gas supply scope covers the Taixing Fine Chemical Industrial Park, mainly serving commercial and industrial users. The project has completed commissioning and trial production, with an initial hydrogen blending ratio of 10%, gradually increasing in subsequent years, with a maximum not exceeding 20%.

Blending hydrogen into natural gas as a clean and low-carbon fuel, it is transported through the established natural gas pipeline network to end-use equipment in sectors such as industry, construction, and transportation that are challenging to decarbonize. This will reduce the carbon emissions from end-use energy consumption. Based on existing technology, blending hydrogen into the natural gas pipeline below a certain ratio does not require the modification or upgrade of existing natural gas pipeline facilities. Therefore, the development of the natural gas hydrogen blending industry not only effectively enhances the overall peak-shaving capacity of the natural gas pipeline network but also supports achieving deep decarbonization of end-use energy.

After the project is put into operation, the near-term annual carbon dioxide reduction can reach 6,430 tons/year, and the long-term reduction can reach 10,930 tons/year.





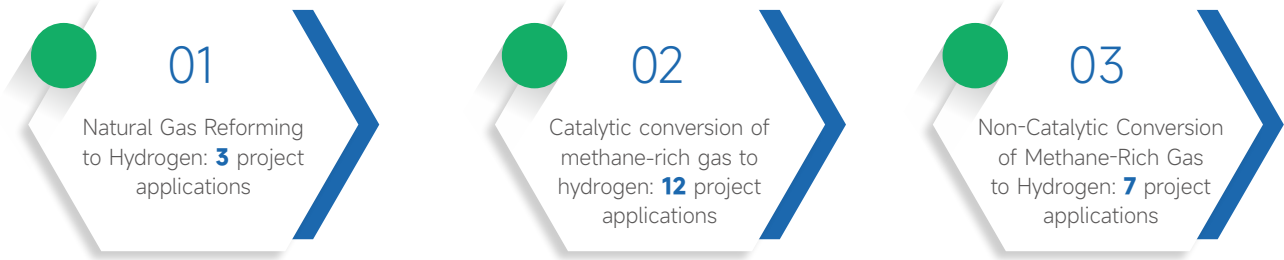
Climate opportunity

Driven by China's "dual-carbon" goals and accompanying policies, the transformation of energy structure, changes in market demand, and ENN-NG' proactive efforts and actions to adapt to climate change have brought new growth opportunities for the Company. These opportunities include improving resource efficiency, expanding into low-carbon and renewable energy, developing new products and services, entering new markets, and enhancing the resilience of the supply chain.

Key climate-related opportunities for ENN are shown in the table below.

Opportunity Type	Opportunity Description	Impact on Value Chain	Impact Period	Financial Impact
Climate-related Opportunities	<b>Resource Efficiency Opportunities</b> <ul style="list-style-type: none"><li>Implementing digital transformation to enhance resource allocation efficiency.</li><li>Contributing to cost savings, such as improving the efficiency of tanker deployment and enhancing energy management efficiency.</li></ul>	Operation	Short term to Mid-term	Cost
	<b>Market Opportunities</b> <ul style="list-style-type: none"><li>Utilizing green financial tools (such as green bonds) to finance or refinance internal energy efficiency improvement and green projects like renewable energy.</li><li>Leveraging green financial support to reduce financing difficulty and capital costs.</li></ul>	Operation	Short term	Cost
	<b>Product and Service Opportunities</b> <ul style="list-style-type: none"><li>Providing clean energy services through integrated energy business to meet the emission reduction needs of downstream industrial and commercial customers.</li><li>Bringing new revenue growth opportunities for ENN-NG, such as green factory and low-carbon park solutions.</li></ul>	Downstream	Mid-term	Revenue
	<b>Product and Service Opportunities</b> <ul style="list-style-type: none"><li>The growing demand for hydrogen driving the growth of ENN-NG' hydrogen-related businesses, including hydrogen production, hydrogen engineering, hydrogen storage and transportation, and hydrogen utilization, creating new development opportunities.</li><li>Continuously monitoring breakthroughs and application demonstrations in hydrogen technology to better integrate hydrogen energy into the integrated energy ecosystem.</li></ul>	Downstream	Long term	Revenue

Grasping Hydrogen Opportunities

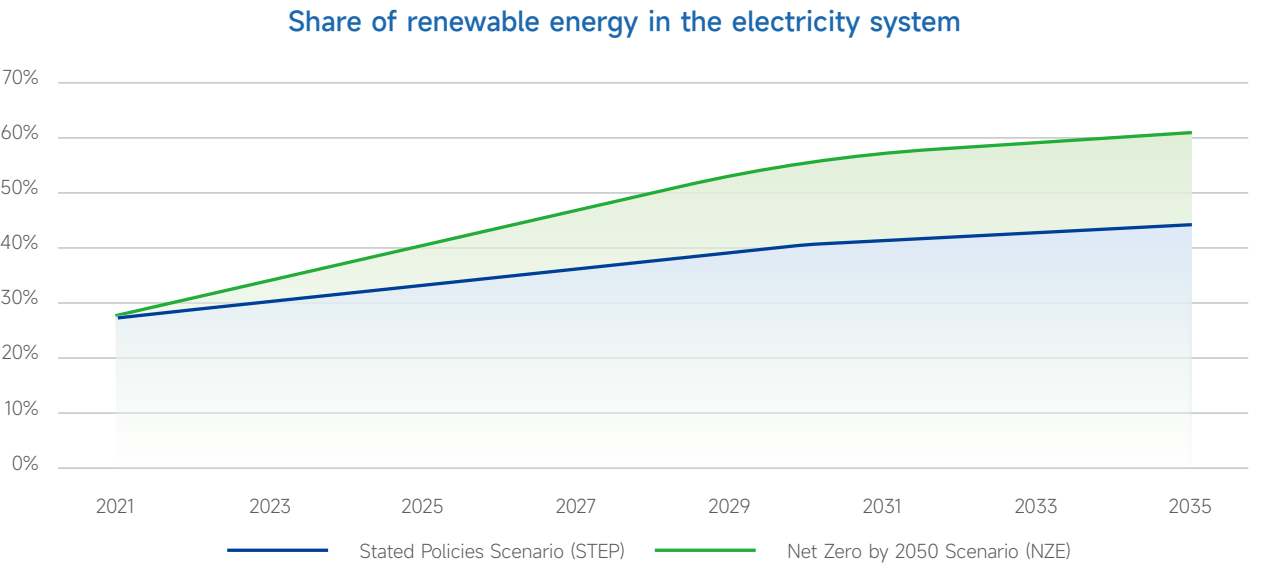


\*Till Q3 2023

Key Climate Opportunity Analysis

Climate Scenario Analysis

To assess the financial impact of the growing demand for renewable energy in the market, ENN Holdings has employed two climate scenarios: the Stated Policies Scenario (STEPS) and the Net Zero by 2050 Scenario (NZE), defined by the International Energy Agency (IEA).



**Key Opportunity #1**

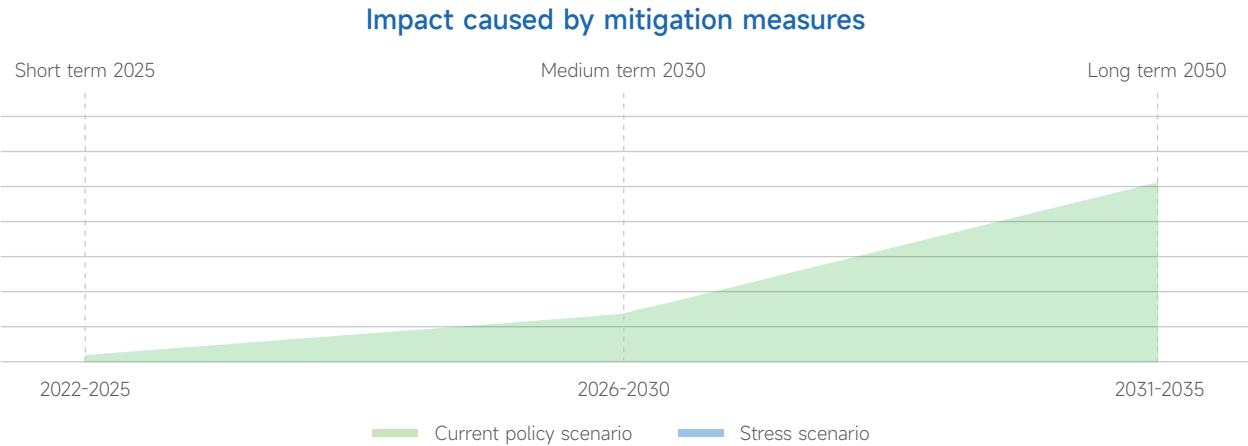
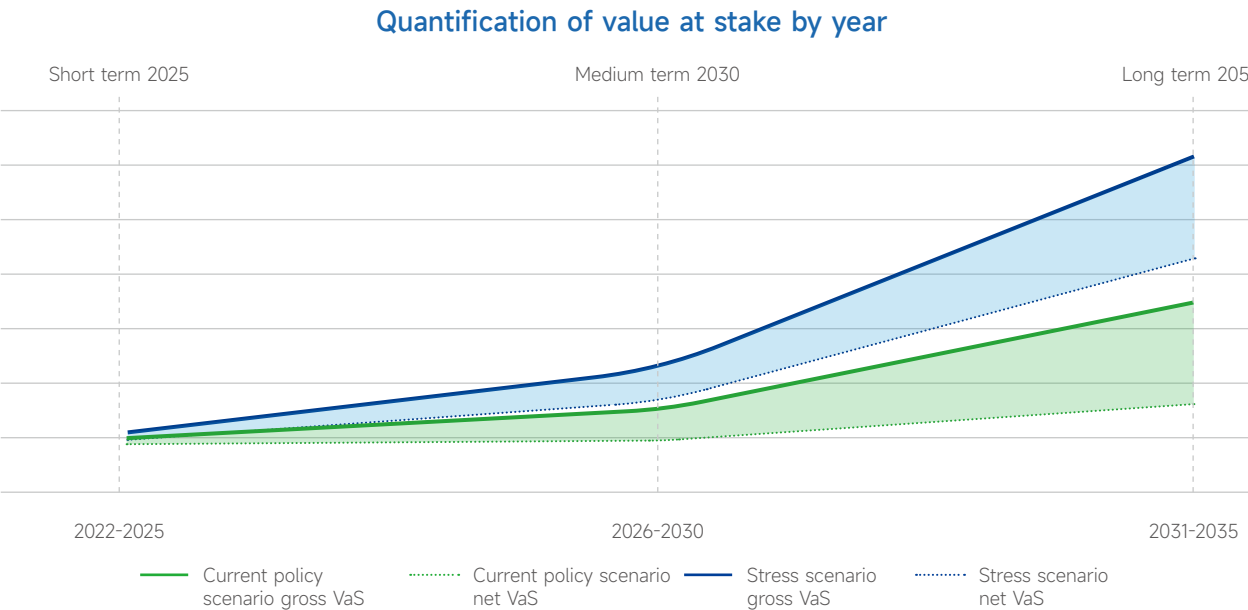
**Growing Demand for Clean Energy Presents New Opportunities for Integrated Energy Business**

**Opportunity Description:** Achieving carbon peak and carbon neutrality has triggered a widespread and profound transformation of the economic and social system. China's "dual-carbon" goals have stimulated significant demand across society for clean energy, low-carbon products, and services. Leveraging years of dedicated efforts in the integrated energy field, ENN-NG has accumulated a wealth of clean energy solutions, a portfolio of low-carbon products, and intelligent energy management tools. These offerings meet the evolving needs of customers transitioning towards clean, low-carbon, and efficient energy. ENN-NG will capitalize on four business scenarios – low-carbon parks, low-carbon factories, low-carbon buildings, and low-carbon transportation – as the foundation, seizing new opportunities emerging from the societal transition towards a low-carbon future.

Financial Impact Results

**Financial Impact Results**  
  
Likelihood: very high  
Velocity: short-term

Opportunity Value (VaS)	Scenario	Opportunity Level
Gross Value Added	current policy scenario	Low (<10%)
Gross Value Added	stress scenario	Mid (10%-50%)
Net Value Added	current policy scenario	Low (<10%)
Net Value Added	stress scenario	Mid (10%-50%)



\*Net risk = total risk - mitigation measures, negative mitigation measures impact is due to upfront capital inputs

Opportunity Action Strategy

The Company adopts a localized strategy for the development of integrated energy businesses. Based on local energy resources and customer needs, it actively applies and integrates various clean energy sources, including natural gas, industrial waste heat and biomass, solar energy, geothermal, etc. Tailored multi-energy complementary integrated energy solutions are designed to meet the diverse energy needs of various users.

Simultaneously, the Company has formulated a green development plan for integrated energy businesses, outlining quantifiable goals such as increasing the proportion of renewable energy, improving system efficiency, and considering the adoption of CCUS technology to further meet customers' low-carbon energy needs. Specific measures include:

**Adjusting the energy structure**

Gradually increasing the installed capacity of photovoltaics, raising the proportion of biomass and geothermal in the energy structure, and considering the introduction of hydrogen utilization in the integrated energy ecosystem after 2025. By 2030, the proportion of renewable energy in the energy structure is targeted to increase to 36%.

**Improving system efficiency**

Before 2030, enhancing the overall system efficiency of energy production facilities in integrated energy businesses through continuous technological upgrades, operational strategy optimization, and improvements in core technologies of smart energy management platforms. The aim is to achieve a 5% increase in system efficiency on the current base of approximately 90%.

**Natural gas decarbonization**

In the short term, selecting pilot projects in well-performing operational areas of the gas company to implement CCUS projects by 2025. Gradually integrating CCUS technology into integrated energy businesses to offset 5% of carbon emissions from natural gas annually.



Key Opportunity #2

Application of Intelligence Technologies for Resource Efficiency Improvement

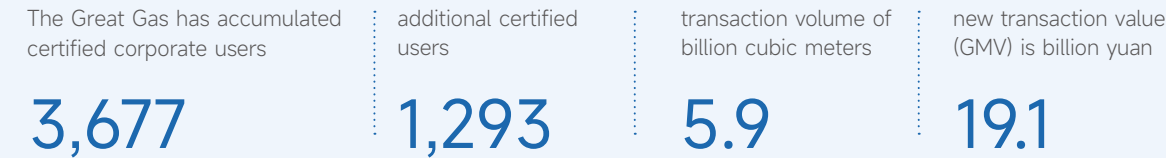
Opportunity Description

ENN-NG

Leveraging its extensive industry experience and vast datasets across comprehensive energy scenarios, ENN-NG, guided by the principles of low-carbon, green, and high-quality development, as well as the idea of developing general artificial intelligence and innovative practices, focuses on key roles in core business scenarios of the natural gas industry. The Company is building an intelligent platform, the Great Gas, to meet customer demands and drive the efficient operation of the industry. The Great

Gas accelerates the aggregation of natural gas industry demands, resources, delivery, and storage ecosystems. It connects the demand and supply sides of natural gas using smart technology, provides scenario data, supports the creation of intelligent products through optimal innovation practices in natural gas scenarios for ENN and the industry, and empowers and aggregates various stakeholders in the natural gas industry to enhance overall industry capabilities and efficiency.

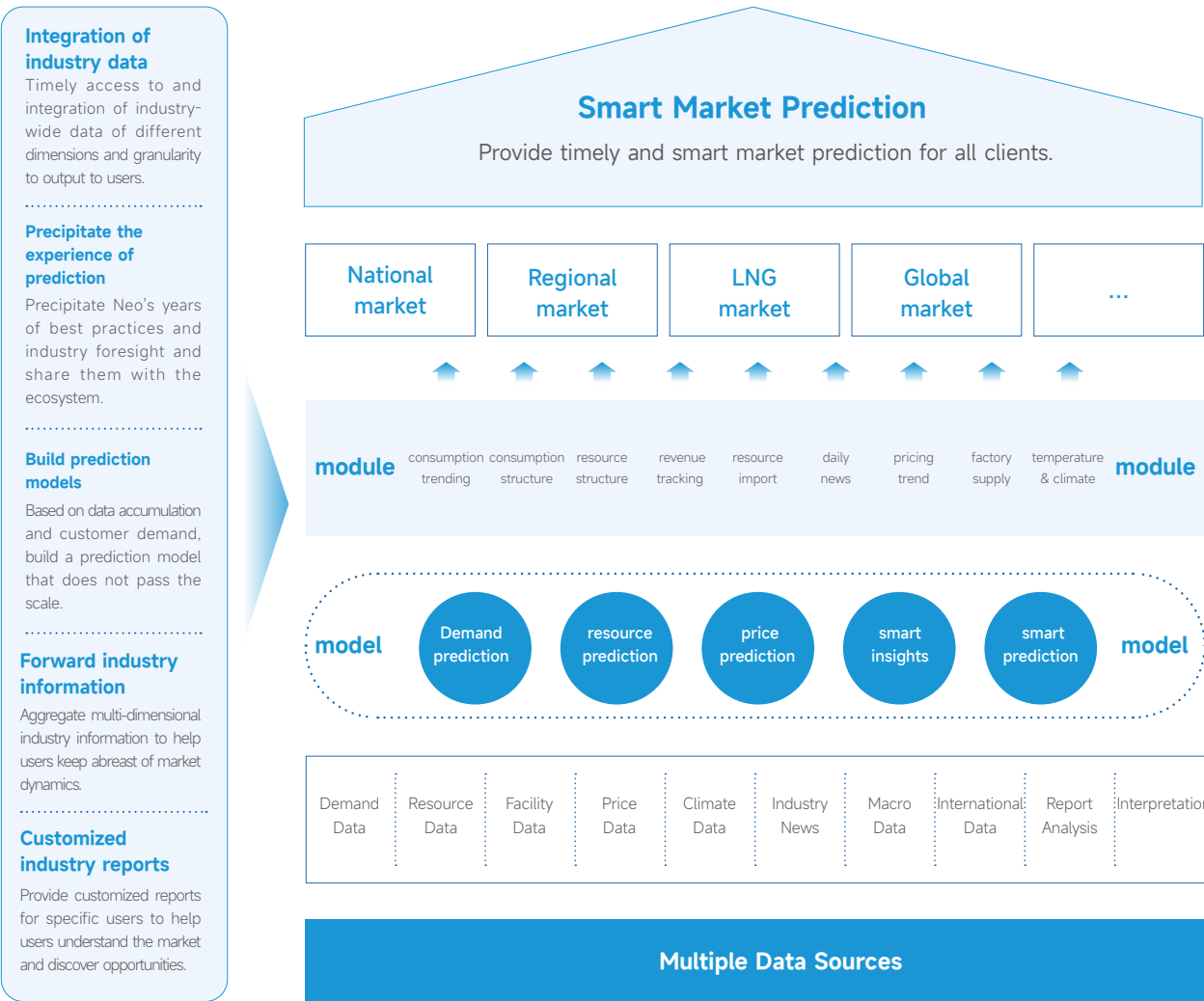
As of November 2023



Opportunity Action Strategy

Utilize climate change predictions for demand matching

The Company continuously optimizes predictive models considering extreme weather events, temperature changes, and the impacts of low-carbon transition policies on natural gas supply and demand. This enhances the support of smart technology for operational decision-making and further optimizes the intelligent matching and delivery response capabilities based on the Good Gas Network.



In the future, the Company will continue to build an intelligent ecosystem for the natural gas industry, accelerate platform aggregation, strengthen intelligent interaction, build an industrial knowledge base, and precipitate more role-based intelligent capabilities, continue to empower the natural gas ecology, and achieve ecological intelligent co-creation.



# Risk Management



ENN-NG fully recognizes the potential impact of climate risks on its business. To effectively manage climate risks, we have integrated climate risk assessment and risk management based on the PDCA (Plan-Do-Check-Act) process, establishing a closed-loop management system for climate risk identification, assessment, control, and supervision.

The Board of Directors of ENN-NG, as the highest decision-making body for risk management, is responsible for the effectiveness of the Company's risk management system. The Board has an Audit Committee tasked with continuous monitoring of the implementation of the Company's risk management policies, ensuring that risks associated with business operations are effectively identified, assessed, and managed. In addition, the ESG Committee is responsible for managing climate change-related issues, regularly discussing climate-related matters, and monitoring climate risks. In 2021, ENN-NG established a specialized Climate Change Impact Response Task Force led directly by Board members. This task force formulated climate risk management policies, gradually completed quantitative analyses of climate-related risks and opportunities within different business segments and promoted the establishment and improvement of climate risk management mechanisms and emergency response mechanisms.

## Climate Change Related Risk Management Process



# Climate-related risk identification and assessment

ENN-NG conducts a comprehensive identification and assessment of climate risks. The process involves identifying climate risk vulnerabilities across the value chain, creating a long list of climate risks and opportunities, prioritizing key climate risks, and conducting financial quantification analysis and stress testing for those key risks.

**Risk Identification:** Following the recommendations of the TCFD disclosure framework, climate-related risks are categorized into two types of physical risks and four types of transition risks. ENN-NG primarily employs the following three approaches for risk identification.

### Physical Risks

- Acute risk (including floods, cyclones, heat waves, droughts, etc.)
- Chronic risk (including changes in mean temperature, heat stress, changes in precipitation patterns, water scarcity, sea level rise, etc.)

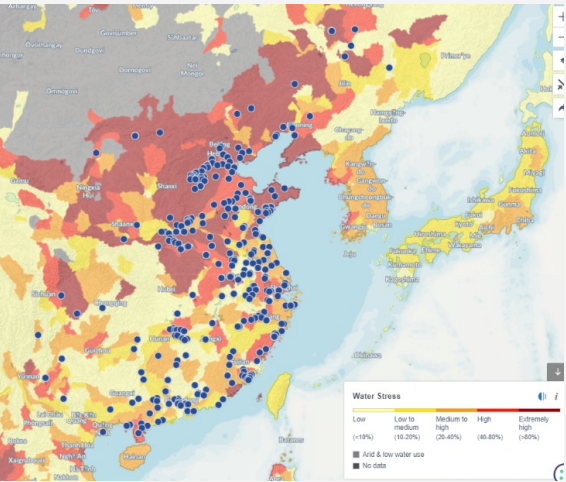


### Transition Risks

- Policy and legal
- Market
- Technology
- Reputation



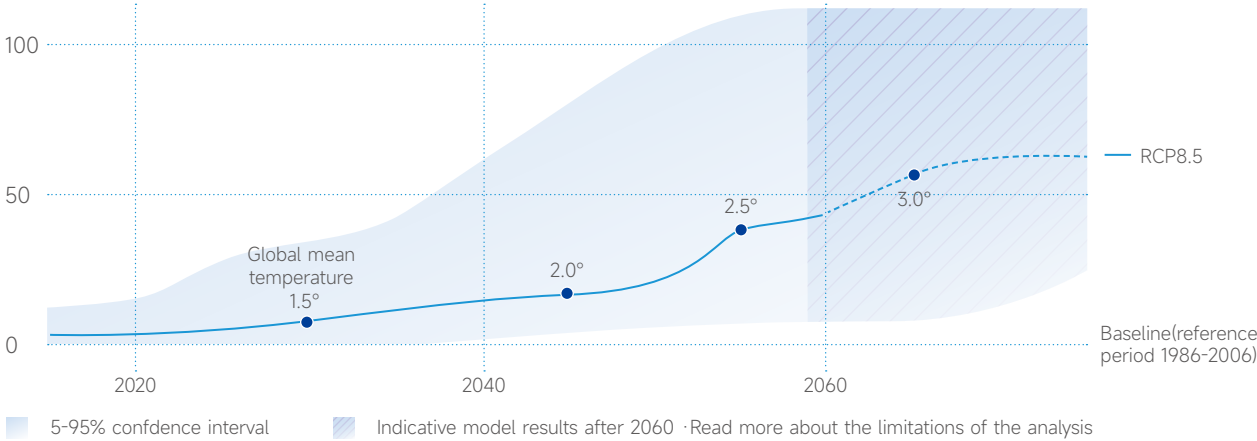
- **Define business scenarios:** Based on the business models, create a value chain diagram for the enterprise and identify links in the value chain with high levels of climate risk exposure, widely engaging relevant departments and management teams in discussion.
- **Physical risk screening:** Based on coordinate data from ENN-NG's upstream and downstream operations, along with its operational sites, we conduct a comprehensive screening for physical risks, using publicly available climate models, such as the WRI Water Risk Atlas, WRI Floods, Coupled Model Intercomparison Project (CMIP 6), and Climate Impact Explorer. The screening process identifies significant physical risks affecting each site under extreme scenarios (e.g., RCP8.5 scenario under a 2050 time-frame). This includes acute physical risks like cyclones, floods, and heatwaves, as well as chronic physical risks such as variations in average temperatures, high temperature stress, water stress, and alterations in precipitation patterns.



Example of a water stress risk screening at an ENN-NG operating site<sup>1</sup>

<sup>1</sup> WRI Water Risk Atlas

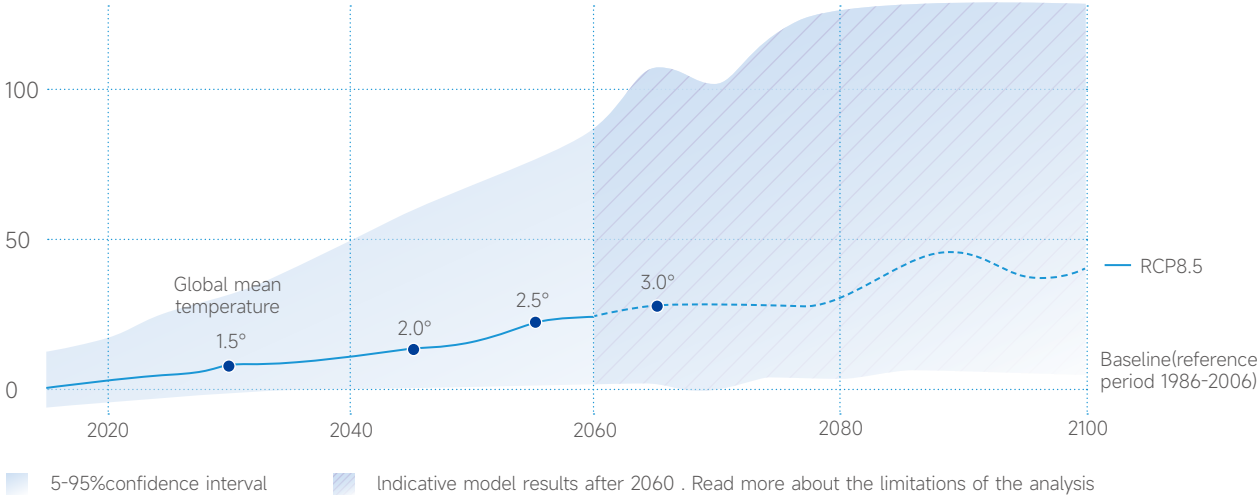
Land fraction annually exposed to Heatwaves in pp



Source: ISIMIP - Secondary Output

Example of heatwave risk screening at an ENN-NG operating site<sup>2</sup>

Land fraction annually exposed to River Floods in pp



Source: ISIMIP-Secondary

Example of flood risk screening at an ENN-NG operating site<sup>2</sup>

**Policy and market monitoring:** Conducting continuous tracking of national "dual-carbon" policies and other climate change policies, as well as the natural gas market trends and low-carbon technologies development progress, to identify transition risks.

<sup>2</sup> Climate Analytics - Climate Impact Explorer

In 2023, ENN-NG identified a total of 58 climate-related risks and opportunities. This included 19 physical risks, 16 transition risks, and 23 climate opportunities. Through expert assessments and departmental discussions, each risk was evaluated based on its likelihood and severity. From this evaluation, the Company identified 8 key climate risks and opportunities—comprising 5 risks and 3 opportunities. These were subjected to scenario analysis and in-depth financial impact assessments using the Value-at-Stake (VaS) methodology.

TCFD Type		Value Chain		
		Upstream	Operation	Downstream
Transition Risk	1.Policy and Legal Risk			
	2.Technology Risk			
	3.Market Risk			
	4.Reputation Risk			
Physical Risk	5.Acute Risk			
	6.Chronic Risk			
Climate Opportunity	7.Resource Efficiency Opportunity			
	8.Energy Source Opportunity			
	9.Products/Services Opportunity			
	10.Markets Opportunity			
	11.Resilience Opportunity			

ENN-NG's climate risks and opportunities identification heatmap\*

**Risk Assessment:** In-depth financial impact assessments (Value-at-Stake analysis, VaS) are conducted for key climate risks and opportunities, considering high-emission scenarios and accelerated climate transition scenarios. Emphasis is placed on scenarios most relevant to the energy industry. In analysing transition risks and climate opportunities, the scenarios from International Energy Agency's (IEA) *World Energy Outlook* are applied, including the Net Zero by 2050 scenario (NZE), Sustainable Development scenario (SDS), and Stated Policies scenario (STEPS). For physical risks, the Intergovernmental Panel on Climate Change's (IPCC) Sixth

Assessment Report is referenced, applying the RCP4.5 and RCP8.5 climate scenarios. Through scenario analysis, we assessed the likelihood, velocity, and financial impact of climate risks and compared the risk values by 2050 under different scenarios. To further evaluate the effectiveness of ENN-NG's mitigation and adaptation measures, these actions are included in the risk quantification process. Consequently, the financial impact results include gross VaS and net VaS after the implementation of mitigation and adaptation measures.

\* Darker colours represent more risk or opportunity.

# Climate risk management

ENN-NG has incorporated environmental and climate risks, along with operational, safety, media, and compliance risks, into its overall risk management framework. This has resulted in a closed-loop management process of "risk identification – risk analysis – risk assessment – risk treatment – monitoring and review." The Company has formulated a *Climate Change Policy*, incorporating climate risks from the perspectives of mitigation, adaptability, and investment. For instance, in project design, construction,

and operation phases, considerations are given to physical risks arising from climate change. During project investments, acquisitions, and due diligence processes, attention is focused on potential GHG emissions, emission reduction potential, and the feasibility of renewable energy deployment. The utilization of renewable energy sources such as photovoltaics, industrial waste heat, biomass, and geothermal energy is considered as a crucial analytical metric.



ENN-NG's Risk Management Process



ENN-NG conducts risk assessments based on different risk scenarios and formulates corresponding control measures. Appropriate policies and strategies are developed through risk management and internal monitoring systems. The Board of Directors is responsible for reviewing the effectiveness of these systems, assessing and determining the nature and extent of risks concerning alignment with company strategic goals and risk tolerance, thereby preventing significant misstatements or losses.

To enhance resilience against climate change and mitigate the potential impact of physical risks on company operations, ENN-NG has introduced specific regulatory documents such as the "Natural Disaster Emergency Plan," "Flood Emergency Plan," and "Extreme Cold Weather Receiving Station Equipment Facility Antifreeze and Emergency Disposal Plan." These documents establish an emergency management system with the General Manager as the emergency overall commander, various business and empowering organizations as emergency action teams, and the Production Operation Scheduling Center as the emergency command headquarters to address unexpected events resulting from extreme weather conditions. For instance, strict adherence to the "Typhoon Emergency Plan" involves units in affected areas preparing for typhoons based on a typhoon preparedness checklist, reinforcing and protecting pipeline facilities, arranging personnel for duty, and conducting a comprehensive foot patrol inspection of the pipeline after the typhoon to assess losses and perform emergency repairs. In response to extreme weather events such as typhoons, extreme precipitation, extreme heat, and extreme cold, ENN-NG utilizes the Swiss Reinsurance online catastrophe risk map set system CatNet, HadEX2, the National Meteorological Information Center, and other databases for risk prediction. Specific impact assessments and control measures are developed, continuously monitoring and managing climate

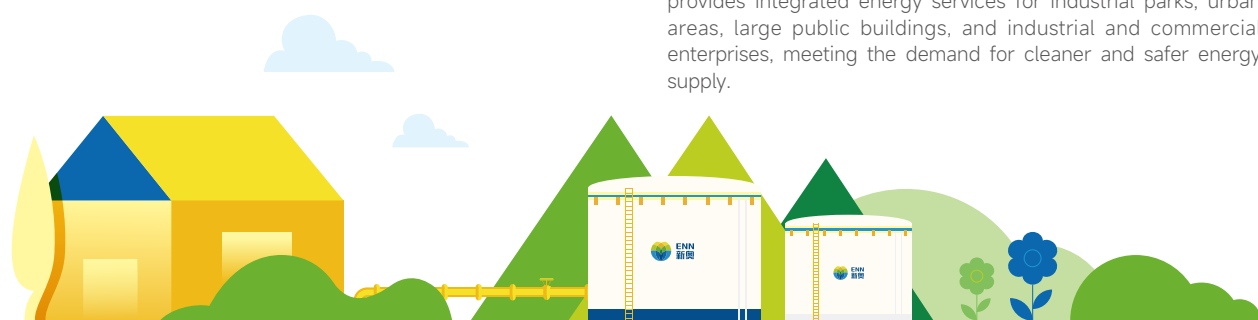
ENN-NG is also committed to mitigating the adverse effects of climate change on the value chain of its business. The Company has implemented a series of risk monitoring, assessment, and management measures for both upstream supply chains and downstream industry chains.

ENN-NG recognizes the sensitivity of its operations to climate change, integrating mechanisms for identifying and addressing climate risks into the Company's planning. To ensure a stable gas supply, ENN-NG employs a flexible strategy in selecting upstream resources, reducing dependence on a single supplier by aggregating diverse resources. The Company globally selects resource combinations that are more environmentally friendly. Additionally, proactive ESG risk assessments are conducted before admitting suppliers. The entire material supply process, including material procurement, supplier evaluation, communication, and storage, undergoes risk identification. In-depth analyses are conducted on potential risks and the corresponding control measures.

risks. For instance, when selecting project sites, climate risks are considered, and risk predictions for typhoon-prone areas are based on three indicators: current wind speed, maximum wind speed in the last 50 years, and storm intensity. This information is used to comprehensively determine the typhoon climate risk level. Additionally, ENN-NG ensures fixed assets, including buildings, production equipment, gas pipelines, storage and distribution equipment, etc., to reduce the risk of asset losses resulting from extreme weather events.

ENN-NG actively establishes a data-driven risk management platform to enhance risk monitoring and management capabilities. For instance, the Company has implemented the internationally leading Commodity Energy Trading Risk Management System (ETRM) and developed the ETMO mobile risk control product. This system monitors and manages risks in the international energy market, specifically addressing fluctuations in gas prices. Additionally, intelligent platforms such as the Gas Smart Inspection and the Smart Monitoring System for Pipeline Corrosion and Geological Changes at the Zhoushan Receiving Station are employed to promptly detect potential risks, ensuring safety in production. The digitized management continually optimizes risk control processes, enabling the timely identification and mitigation of potential risks.

ENN-NG actively promotes the involvement of downstream industries in identifying and addressing climate risks. The Company has established a sustainable development risk assessment system for customers, forming a climate change impact response team. This team identifies and dynamically tracks potential climate change risk factors associated with ENN-NG's products, services, and future operations. This ensures effective risk control. Following risk determination, corresponding management actions are taken based on the risk's timeframe. Furthermore, the Company collaborates with customers to regularly review the adequacy of risk management efforts and strives to mitigate risks. In support of societal emission reduction efforts, the Company's integrated energy business adopts a model prioritizing clean energy and mutual complementarity. It provides integrated energy services for industrial parks, urban areas, large public buildings, and industrial and commercial enterprises, meeting the demand for cleaner and safer energy supply.



## CLIMATE RISK MANAGEMENT CASES

### Risk Assessment and Management of Zhoushan LNG Terminal

ENN-NG, using the Zhoushan LNG Terminal as a pilot, quantitatively assessed and implemented corresponding management measures for the typhoon risks it faces.

- **Risk Identification:** Physical risk screening was conducted for the Zhoushan Terminal and the pipeline company, identifying the primary risk as typhoon-related risk, which could result in damage to the LNG terminal vessels, and delays in transportation.
- **Risk Assessment:** Focusing on the most significant acute physical risk – typhoons for Zhoushan LNG Terminal, the evaluation considered major financial impacts from the perspectives of income and expenditure, assets and liabilities, and capital and financing. Following financial analysis and assessment, the actual outbound volume of the Zhoushan LNG Terminal in 2022 decreased by 13,632.5 tons due to the Hinnamnor and Muifa typhoon events, resulting in an economic loss of CNY 1,526,840.
- **Risk Management:** ENN-NG developed targeted risk prevention and control plans, regularly supervising, analysing, early warning, and reporting on the progress of actions. The Company conducted risk assessments and adjustments in areas such as transportation routes and ports selection to reduce the impact on potentially affected regions and facilities. Additionally, it strengthened hydraulic engineering measures and implemented flood control measures in risk-prone areas. To enhance the efficiency of risk prevention and control, ENN-NG leveraged digital platforms, utilizing a digitalized risk management approach tailored to business scenarios and needs. This platform consolidates identified risks, corresponding prevention and control strategies, establishes warning indicators based on existing data, issues risk behaviour alerts, and notifies relevant business personnel for handling.



## CLIMATE RISK MANAGEMENT CASES

### Enhancing Climate Resilience Across the Entire Natural Gas Industrial Chain through the Intelligent Platform – The Great Gas.com

ENN-NG's intelligent platform for the natural gas industry, known as the Great Gas, spans various scenarios from smart operations to energy-use services. It promptly captures the supply and demand variations resulting from climate change, providing distributors with predictive demand services and assisting clients in flexible resource procurement, supply-demand balancing, and resource allocation. Additionally, it offers real-time monitoring of pipeline and station operational status, delivery shortfalls, and inventory resources. In the event of extreme weather or temperature changes causing fluctuations in gas demand, the platform enables swift inventory adjustments. Leveraging the capabilities of this digitized platform, ENN-NG enhances its capacity to adapt to climate risks while empowering the entire natural gas industrial chain and supporting to create a more climate-resilient industry ecosystem.

# 04

## Metrics and targets



# GHG emissions metrics and targets

ENN-NG continues to drive its subsidiaries to conduct carbon inventories, aiming to gain insights into the greenhouse gas emission levels of each company. This initiative further strengthens the foundation for energy conservation and emission reduction efforts. In 2022, ENN-NG conducted Scope 3 calculations, disclosing key emission categories closely tied to its operations. These categories

include emissions from natural gas production, transportation, and usage processes, as well as employee travel and commuting. Going forward, the Company plans to progressively enhance its value chain carbon inventories, extending coverage to more Scope 3 categories.

Indicator	Unit	2022	2021	2020
Company Carbon Footprint				
Scope 1 emissions	10000 tonnes of carbon dioxide equivalent	391.83	428.47	431.49
Scope 1 emission intensity (turnover as denominator)	10000 tonnes of carbon dioxide equivalent/ RMB 1 billion revenues	2.54	3.70	4.90
Scope 1 emission intensity (gas sales as denominator)	10000 tonnes of carbon dioxide equivalent/ 1 billion cubic meters of natural gas	10.79	11.52	19.66
Scope 2 emissions	10000 tonnes of carbon dioxide equivalent	57.33	42.58	35.91
Scope 2 emission intensity (turnover as denominator)	10000 tonnes of carbon dioxide equivalent/ RMB 1 billion revenues	0.37	0.37	0.41
Scope 2 emission intensity (gas sales as denominator)	10000 tonnes of carbon dioxide equivalent/ 1 billion cubic meters of natural gas	1.58	1.14	1.64
Scope 1+2: Total GHG emissions	10000 tonnes of carbon dioxide equivalent	449.15	471.05	467.40
Scope 1+2: Total GHG emissions (turnover as denominator)	10000 tonnes of carbon dioxide equivalent/ RMB 1 billion revenues	2.91	4.06	5.31
Scope 1+2: greenhouse gas intensity (gas sales as the denominator)	10000 tonnes of carbon dioxide equivalent/ 1 billion cubic meters of natural gas	12.37	12.66	21.29
Scope 3: Business travel and employee commuting emissions	10000 tonnes of carbon dioxide equivalent	2.09	2.25	/
Carbon Footprint related to Natural Gas Product				
Scope 3: Natural gas production emissions	10000 tonnes of carbon dioxide equivalent	1,045.19	1,123.36	/
Scope 3: Upstream and downstream transportation emissions	10000 tonnes of carbon dioxide equivalent	204.06	157.61	/
Scope 3: Use of sold gas emissions	10000 tonnes of carbon dioxide equivalent	5,820.79	5,467.12	/
Total GHG emissions (Scope 1, 2, 3)	10000 tonnes of carbon dioxide equivalent	7,521.28	7,222.19	/

Note: Scope1 and 2 measurements refer to the National Development and Reform Commission's (NDRC) Guidelines on Methodologies for Accounting and Reporting of Greenhouse Gas Emissions by Enterprises, ISO 14064-1 Greenhouse Gases - Part 1: Guidance on Quantification and Reporting of Greenhouse Gas Emissions and Removals at the Organisational Level; Scope 3 measurements mainly refer to the Greenhouse Gas Accounting System: Accounting and Reporting Standard for Enterprise Supply Chains (Scope 3) (GHG Protocol), and the Ministry of Ecology and Environment's Guidelines for Verification of Enterprise Greenhouse Gas Emission Reporting.

The main source of the coefficients used for GHG emissions measurement is the default values of common fossil fuel characteristic parameters in Appendix II of the "Guidelines on Accounting Methods and Reporting of Greenhouse Gas Emissions by Oil and Gas Producing Enterprises in China (for Trial Implementation) issued by the NDRC.

# Outlook

In 2023, the IPCC officially released the *Synthesis Report for the Sixth Assessment Report*, emphasizing that GHG emissions will cause further global warming, escalating climate risks, and other related damages. The report highlights the urgent need for deep, rapid, and sustained reductions in GHG emissions worldwide. During the 28th Conference of the Parties (COP28) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Dubai, United Arab Emirates, countries conducted the first global stocktake since the completion of the Paris Agreement. They also adopted, for the first time, the Global Adaptation Goal framework and the Just Transition Pathways work program, demonstrating the collective efforts of the international community in addressing climate change. As a significant participant, contributor, and torchbearer in the global climate governance, China has consistently reckoned climate change as an intrinsic requirement for sustainable development and a responsibility to building a community with a shared future for humanity. Currently, China has established a policy system for carbon peaking and neutrality, along with various strategies and action plans. Actively responding to China's dual-carbon goals and contributing to the global efforts to address climate challenges are responsibilities that ENN-NG, as one of China's largest private energy enterprises and a responsible industry leader, cannot shirk.

ENN-NG has incorporated climate change risks and opportunities into its strategic concerns, established effective climate governance structures, strengthened the board's supervision of climate issues, and continuously improved its risk management system to effectively

address increasing climate risks and enhance the Company's climate resilience. Embracing the trend of the times, ENN-NG actively seizes opportunities brought about by climate change, capitalizing on energy transition and downstream demand for energy conservation and carbon reduction. The Company explores energy facility optimization and digitalized energy-saving tools covering natural gas, engineering construction, and park operations, providing effective integrated energy solutions tailored to specific customer needs. ENN-NG is committed to innovation, deeply engaging in digitalization technologies, empowering the ecosystem with digital products, reducing its own emissions, and promoting the entire industry's green and low-carbon transformation.

Heading for a green future, ENN-NG will persistently uphold the mission of sustainable development, aiming to achieve "carbon peaking by 2030 and carbon neutrality by 2050". The Company adheres to the commitments outlined in the *Green Action 2023*, continually optimizes its energy structure, provides high-quality transformation solutions, and empowers the entire industry chain for green value enhancement and industrial intelligence upgrading. ENN-NG has made promises to actively undertake the responsibility of promoting the green and low-carbon development and transformation of the energy industry. The Company will also consistently monitor and manage risks, preparing to face more severe climate challenges in the future. As a responsible intelligent operator in the natural gas industry, ENN-NG looks forward to exploring low-carbon solutions with partners across the industry value chain and jointly moving towards a sustainable future.



ENN  
新奥

新奥天然气股份有限公司  
ENN Natural Gas Co., Ltd.

