



昆仑能源



Kunlun Energy Company Limited  
**Action Plan Towards Carbon Peaking and Carbon Neutrality**  
2024 Edition

# Message from Chairman

Global warming is one of the gravest challenges humanity confronts in the 21st century, with combatting climate change emerging as a universal consensus. Ranking among the top natural gas retail suppliers at home, Kunlun Energy always strives for contributing to a beautiful China and a better life. We move faster to drive a green, low-carbon transition and pursue a balance across environmental impact, social influence, and commercial value, setting an example as a pioneer implementing major decisions and arrangements for the national dual carbon goals.

In 2022, we released the *Action Plan Towards Carbon Peaking and Carbon Neutrality (Version 1.0)*, promising to peak carbon emissions by 2030 and achieve net-zero emissions by 2050. Over the past two years, committed to green and low-carbon development, we have been enhancing efficiency of integrated energy utilization, refining our energy supply structure, and engaging in the GHG emissions action. By 2023, our GHG emission intensity has declined by about 15% compared to 2020, over-fulfilling the target of dropping by 9%.

We further commit to achieving net zero emissions across our LPG, urban gas distribution network, and branch pipeline operations by 2035. In the future, we will keep refining our path to implementing the strategic carbon peak and neutrality targets in light of actual circumstances. Focusing on four actions for increasing energy-saving and circular efficiency, expediting the energy transition, deepening technological innovation, and building a green brand, we will move faster to grow into an internationally renowned and domestically first-class green energy integrated supplier. Endeavoring to be a pioneering model, standard setter, and industry leader in carbon peaking and carbon neutrality within the gas sector, we will make greater contributions to addressing climate change.

Chairman & Executive Director: Fu Bin

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# Our Efforts



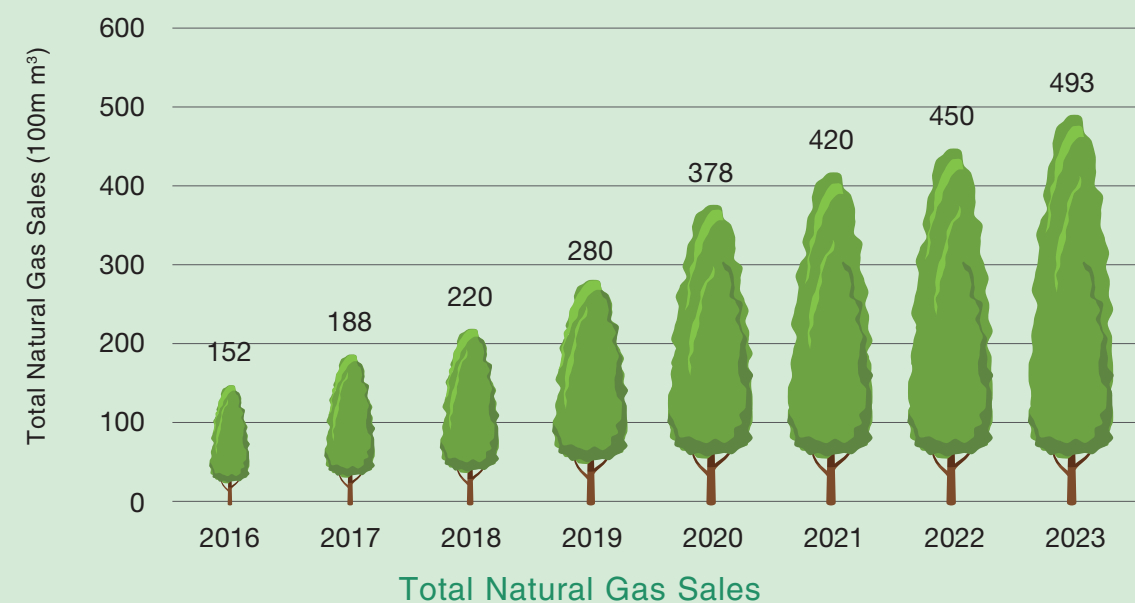




## Promoting Clean Energy Utilization

Ranking among the largest natural gas suppliers by sales in Chinese mainland, Kunlun Energy is dedicated to delivering a secure and stable supply of green energy and high-quality, efficient customer services. From 2016 to 2023, our total natural gas sales surged from 15.2 billion m<sup>3</sup> to 49.3 billion m<sup>3</sup>. Cumulatively, we have sold approximately 258.1 billion m<sup>3</sup>, equivalent to replacing 343 million tons of standard coal and cutting CO<sub>2</sub> emissions by roughly 385 million tons, supporting the national transition in energy mix.

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roughly  
**385** million tons



## Advancing Energy-Saving and Carbon Reduction

### Implementing Clean Production

Through multiple initiatives such as encouraging new energy development, elevating our electrification rate, and conducting clean production audits, we extensively apply energy-saving and emission reduction technologies and embed low-carbon philosophy into practical work. In the past three years, we have advanced wind and photovoltaic power and differential pressure power generation projects; further applied efficient electric heating equipment, efficient heat pumps, and photo-thermal and thermal storage technologies; and deepened research in waste heat and energy utilization technologies. We have achieved 21 MW of installed capacity for clean power generation, completed clean production audits for two LNG receiving stations and five LNG factories, and have put in action more than 30 clean production measures with significant results.



#### Case: Huanggang and Tai'an plants are built into clean production models

At our LNG plants in Huanggang (Hubei) and Tai'an (Shandong), the results of clean production audits have been actively applied. By implementing 12 clean production initiatives, such as process optimization, parameter adjustments, and energy-saving equipment installations, and investing in around RMB11 million, they cut down on 230,000 tons of wastewater and approximately 12,000 tons of CO<sub>2</sub> emissions, along with an annual cost savings of about RMB20 million, showcasing substantial environmental and economic benefits.



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**12,000**  
tons of CO<sub>2</sub> emissions



savings of about  
**RMB20** million



#### Case: Tangshan LNG Receiving Station achieves energy-saving and efficiency through process optimization

By optimizing the operational mode of BOG compressors and the loading procedure for tankers, the Tangshan LNG Receiving Station has saved 1.8 GWh of electricity. By predicting the amplitude and rate of changes in seawater temperature and fitting the maximum operating load curve of the seawater ORV gasifier in winter, it has refined energy consumption, saving 3.2 million m<sup>3</sup> of natural gas per year.



saved **1.8** GWh of  
electricity



saving **3.2** million m<sup>3</sup>  
of natural gas





## Controlling Methane Emissions

We have joined the China Oil and Gas Methane Alliance, engaged in industry-wide technical exchanges and research, advanced the methane leak detection and repair (LDAR), and managed BOG recycling in an orderly manner.



### Case: Kunlun Energy joins the China Oil and Gas Methane Alliance

In 2021, Kunlun Energy joined the China Oil and Gas Methane Alliance, actively fulfilling member responsibilities, participating in collaborative methane emission control, and conducting research on methane emissions from city gas services.



### Case: Kunlun Energy advances methane LDAR

Utilizing technologies and methods such as PTZ lasers, drones, mobile vehicles, handheld devices, and detection dogs, Kunlun Energy conducts methane LDAR. Notable applications include the use of PPB-level BeiDou high-precision gas leak detection vehicles in Beijing and Kunming for swift and precision detections of leaks in high and medium pressure underground pipelines, as well as residential overhead pipelines.



In-vehicle Mobile Detection



Drone Leak Detection

The Dengkou Plant of Kunlun Energy Inner Mongolia Branch engaged a third party for methane LDAR, achieving a 45% reduction in methane leaks.



### Case: Kunlun Energy conducts BOG recycling in an orderly manner

BOG recycling measures have been adopted in 95 sites including LNG receiving stations, LNG plants, and primary CNG filling stations, achieving zero BOG emissions in normal operational conditions.

## Expediting New Energy Projects

Kunlun Energy has been moving faster to optimize the new energy system, planning for new energy development, and increasing the share of green energy utilization, supporting the green, low-carbon development of industrial parks.



### Case: Kunlun Energy encourages new energy development and utilization

We have capitalized on rooftops, open spaces, and existing facilities at sites to develop distributed photovoltaic (PV) and decentralized wind energy projects. To date, 24 distributed PV projects have been completed, totaling an installed capacity of 3.1 MW and a power generation of 976 MWh, with 484.8 MWh consumed internally.



### Case: Kunlun Energy explores the introduction of grid parity green electricity

The Bazhou Plant of Kunlun Energy Hebei Branch has purchased green electricity at municipal grid parity, acquiring 11 green electricity consumption certificates and 29.607 GWh of green electricity, reducing CO<sub>2</sub> emissions by 24,000 tons.



reducing CO<sub>2</sub> emissions by  
**24,000** tons



Green Electricity Consumption Certificate



### Case: Kunlun Energy supports the green, low-carbon development of industrial parks

The "Hainan LNG Reserve's Combined Cooling, Heating, and Power Demonstration Project" was awarded the "First Prize for the 2021 Best Comprehensive Distributed Energy Project" at the 17th China Distributed Energy Global Forum, achieving an annual reduction of standard coal electricity consumption by 1.51 GWh.



standard coal electricity  
consumption by **1.51** GWh



First Prize for the 2021 Best Comprehensive Distributed Energy Project



### Case: Kunlun Energy facilitates the substitution of fuel vehicles

As of 2023, we have retired 34 diesel-fueled vehicles, with new energy vehicles now constituting 28% of our operational fleet.



with new energy vehicles now  
constituting **28%** of our  
operational fleet





## Creating a Zero-Carbon Demonstration Model

Anchored in our business characteristics, we have tapped the potential for carbon reduction. Harnessing the power of new energy, digitalization and intelligence, and market mechanisms, we pioneer the creation of a zero-carbon demonstration model that can propel green, low-carbon progress throughout the industry.

**Case: Kunlun Energy pioneers a zero-carbon natural gas sales model**

In April 2022, we secured the first carbon neutral certificate for natural gas sales, successfully launching a zero-carbon sales model for "carbon metrics + natural gas". This marked a significant leap from theoretical exploration to scientific application.



carbon metrics

+




natural gas



First Carbon Neutral Certificate for Natural Gas Sales

**Case: Kunlun Energy supports the building of the Bo'ao Near-Zero Carbon Demonstration Zone**

We have completed and put into operation Hainan's first PV-storage-charging integrated energy service station, setting an innovative benchmark for Haikou's charging infrastructure. The main construction of the LNG reserve's PV project has been finalized as a zero-carbon site. We have also completed and put into operation Hainan's first unmanned natural gas service hall at the Bo'ao city gate station, alongside charging and PV generation facilities, expediting the integrated development of oil, gas, and new energy.



Integrated Energy Service Charging Station

**Case: Kunlun Energy creates carbon neutrality demonstration stations**

In 2023, the Nanjing, Taizhou, and Changshu natural gas city gate stations of Kunlun Energy Jiangsu Branch achieved carbon neutrality and were certified accordingly.



南京星桐中石油昆仑燃气有限公司  
碳中和门站



泰州中石油昆仑燃气有限公司  
碳中和门站



常熟中石油昆仑燃气有限公司  
碳中和门站

Bronze Certifications for Carbon Neutral City Gate Stations

**Case: Kunlun Energy builds an intelligent zero-carbon natural gas city gate station**

In December 2023, the Shengli Station of Kunlun Energy Yinchuan Branch, Ningxia's first unmanned intelligent zero-carbon natural gas city gate station, was completed and put into operation on schedule. The station, operating under a new IoT model with unmanned operations, centralized monitoring, and minimal human intervention, represents a pioneering green, low-carbon, intelligent project.



Inspection Robot



Shengli Station of Kunlun Energy Yinchuan Branch



PTZ Control System



## Our Honors



### Company-level

- ★ **17th** place in the 2022 list by “State-owned Enterprise ESG•Pioneer 50 Index” and shortlisted into the *Research Report on ESG of Listed Companies Controlled by Central Enterprise (2022)* as an outstanding case
- ★ **BBB** by MSCI ESG ratings and **B** by CDP ratings
- ★ “**Best ESG Company Award**” at the sixth Zhitong Finance Gold HK Stocks Conference
- ★ “**Best ESG Award**” in the energy industry by *Institutional Investor*
- ★ “**Best Organization Award**” from China Green Foundation to the “I Plant a Tree for Carbon Neutrality” campaign



### Subordinate-level

- ★ “**Grade-B** Industrial Enterprise by Environmental Protection Standardization in Gansu Province” to the LNG Plant of Kunlun Energy Gansu Gas Branch in 2022



- ★ Thanks to active technological transformation, Kunlun Energy Tangshan Branch participated in competitions for innovative technologies, with its LNG Receiving Station's energy-saving technology application winning **the national silver award** in the innovation category at the 2nd China Youth Carbon Neutral Innovation and Entrepreneurship Competition







# Our Goals







We have break the overarching goal of “carbon peaking by 2030 and net zero emissions by 2050” down to three steps. We strive to achieve carbon peak in advance by 2027 and net zero emissions across our LPG, urban gas distribution network, and branch pipeline operations by 2035.



# 1

## First step: Carbon peaking by 2030.

Our focus will be on holistic energy-saving and carbon reduction, phasing out coal and oil and establishing low-carbon and zero-carbon demonstration sites. By 2030, we will peak CO<sub>2</sub> emissions, reduce methane emission intensity by 20% from the 2020 level, significantly raise energy efficiency, and transform from a natural gas distributor to an integrated green energy supplier.

# 2

## Second step: Intensive carbon reduction between 2031 and 2040.

Our focus will be on renewable energy development, including comprehensive wind-PV-gas-power-hydrogen utilization demonstrations, progressive electrification of end-use energy consumption, and expansion of low-carbon and zero-carbon demonstration sites. By 2035, our LPG business, urban gas network operations, and branch pipeline services will lead in achieving net zero emissions. By 2040, we will reduce both CO<sub>2</sub> and methane emission intensities by 40% from their 2020 levels, with our new energy business becoming a pivotal support for Kunlun Energy’s green industrial transformation.



2025



2030

2035

2040

### Specific goals by 2025:

- 🌐 Achieve an installed capacity of **200 MW** of green power;
- 🌐 Cease the use of coke oven gas starting from 2023 and coal from 2024 onwards;
- 🌐 Eliminate the addition of fossil-fueled vehicles;
- 🌐 Increase the proportion of low-carbon and zero-carbon demonstration sites to **15%**.

### Specific goals by 2030:

- 🌐 Achieve an installed capacity of **400 MW** of green power;
- 🌐 Reduce energy consumption in office buildings by **20%** compared to 2020;
- 🌐 Completely phase out diesel-fueled vehicles;
- 🌐 Increase the proportion of low-carbon and zero-carbon demonstration sites to above **50%**.

### Specific goals by 2035:

- 🌐 Achieve net **zero emissions** across our LPG, urban gas distribution network, and branch pipeline operations;
- 🌐 Achieve an installed capacity of over 800 MW of green power and a **40%** share of green power consumption;
- 🌐 Increase the proportion of non-fossil energy consumption to **30%**;
- 🌐 Increase the proportion of low-carbon and zero-carbon demonstration sites to above **65%**.

### Specific goals by 2040:

- 🌐 Achieve an installed capacity of over 1,600 MW of green power and a **60%** share of green power consumption;
- 🌐 Increase the proportion of non-fossil energy consumption to above **50%**;
- 🌐 Increase the proportion of low-carbon and zero-carbon demonstration sites to above **80%**.





3

### Third step: Net zero emissions between 2041 and 2050.

Our focus will be on renewable energy expansion. By 2045, 100% of our power will be derived from green sources. We will intensify the electrification of end-use energy consumption and further expand the applications of green hydrogen and carbon-negative technologies.



**100%**  
green power

2050

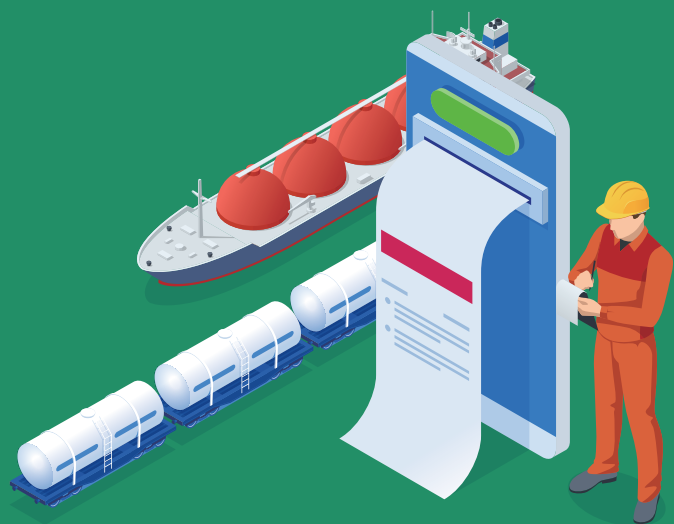
By 2050, our green power installations will exceed **3,200 MW**, non-fossil energy consumption will surpass **95%**, carbon emissions will be slashed from peak levels. By employing carbon-negative technologies, we will achieve net **zero emissions** and drive energy-saving and carbon reduction across our entire industrial chain, forming an efficient green energy system.







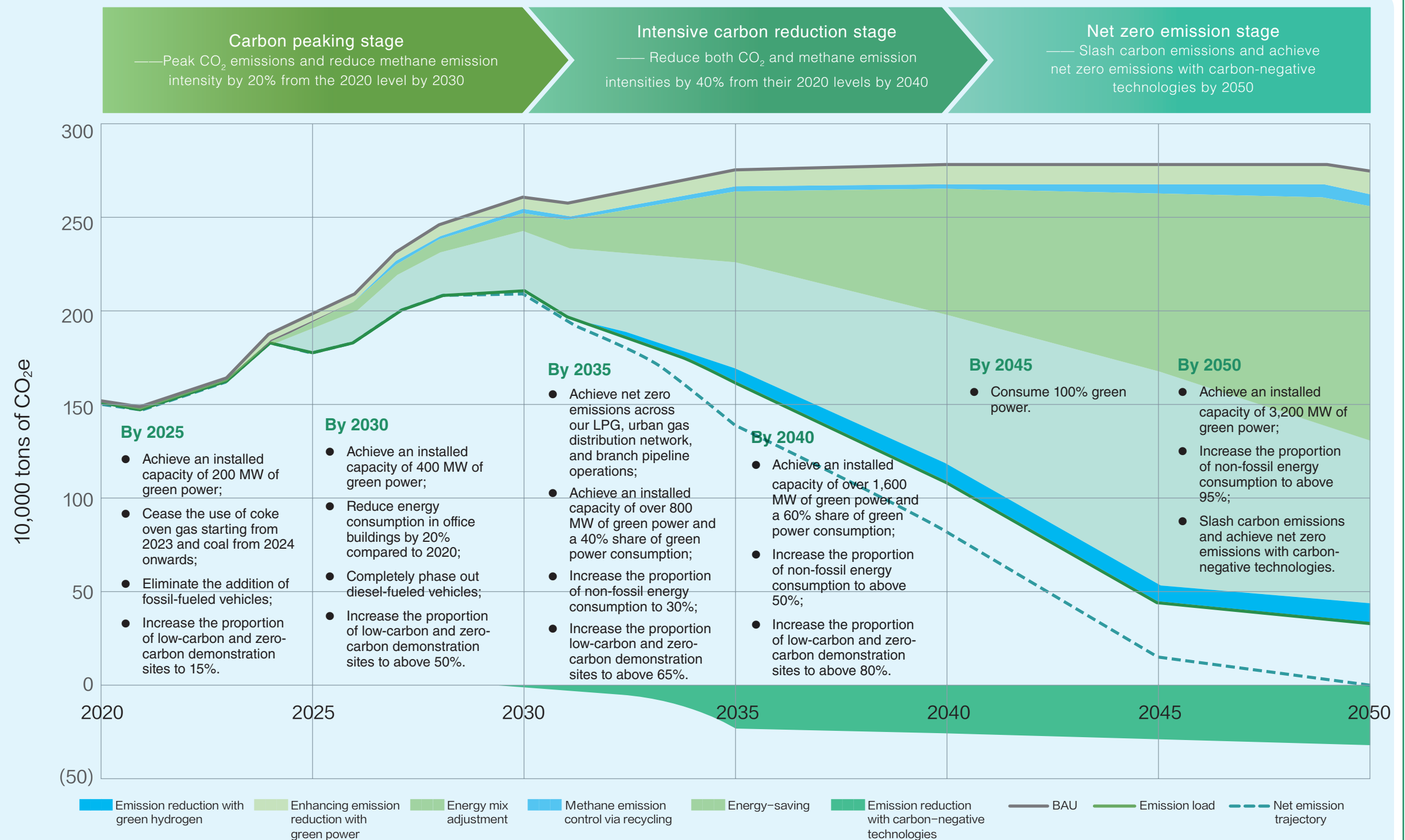
# Our Actions







## Panorama of the Net-Zero Path



Note: Calculated mainly according to the Guidelines on the GHG Emission Accounting and Reporting for Chinese Oil and Gas Production Enterprises (for Trial Implementation).



# Action Plans

## Promoting Energy-Saving, Efficiency Improvement, and Emission Control

### 1 Advancing industrial energy-saving and carbon reduction.

We will conduct regular energy-saving diagnosis and clean production audits, intensify the adoption and integration of new energy-saving equipment, technologies and materials, formulate action plans for energy-saving and carbon reduction on a rolling basis, and tap the potential for energy-saving and carbon reduction.

Benchmarked against the industry's top performers, we will strengthen equipment upgrades and revamps to enhance motor system efficiencies, aiming to phase out inefficient and energy-intensive process units by 2035.



By boosting comprehensive utilization of residual heat, pressure and energy, including retrofitting LNG plants for regenerative heat recovery, developing pressure differential power generation at retail stations, and implementing cold energy recovery at LNG receiving stations, we aim to reach an installation capacity of **10 MW** for cold and pressure differential power generation by 2028.

We will expedite the IT application in energy management, continually refine the gasification process for natural gas, optimize large-scale energy systems, and improve multi-energy supply across regions and integration across installations, thereby comprehensively boosting system efficiency.

### 2 Adopting green design and expanding green buildings.

We will adopt green planning and design to promote energy-saving renovations in existing buildings. For new buildings, we will evaluate carbon emissions in the design and acquisition stages, prioritize energy-efficient designs, and promote unmanned and intelligent sites, aiming for 85% of new sites to be unmanned by 2030.

We will save energy consumed in office spaces by installing rooftop PV for self-use, replacing ordinary lamps to LED energy-efficient ones, and equipping time-controlled switches, aiming to cut energy consumption in office buildings by 20% from the 2020 level by 2030.



### 3 Enhancing recycling and advancing methane emission control.

We will develop an action plan for methane emission control and incorporate it in performance evaluations.

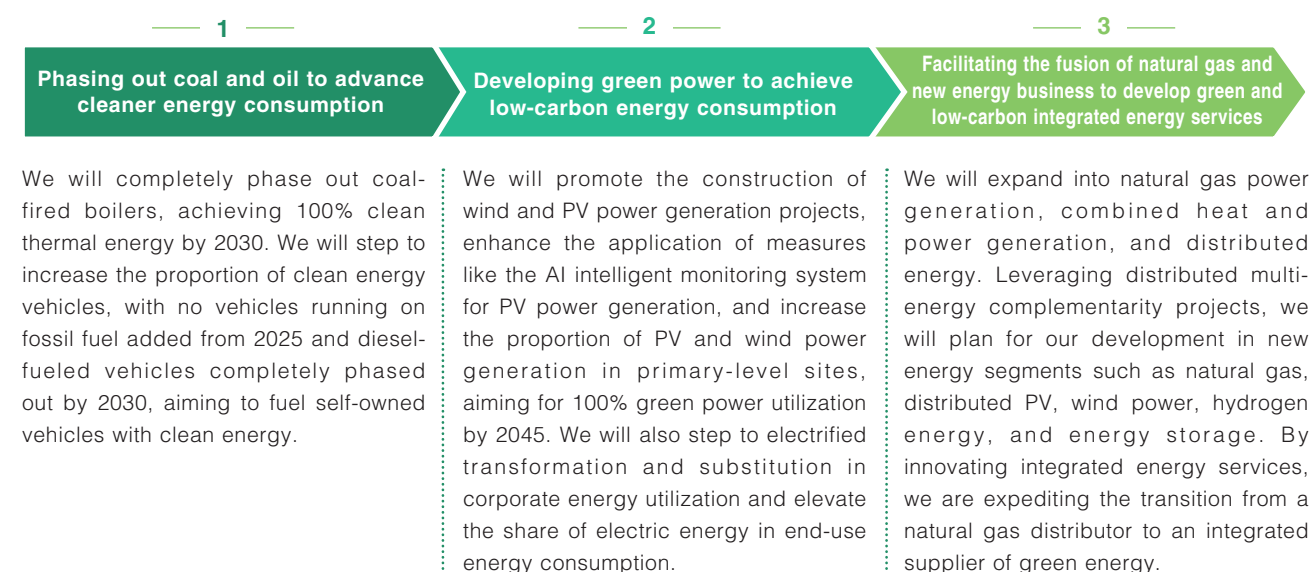
By improving BOG recycling, optimizing flow parameters for LNG lamps at LNG plants, and installing new BOG recycling process devices, we aim to fully realize BOG recycling at LNG plants and basically eliminate flare combustion under normal working conditions by 2030.

We will enhance methane emission monitoring, intensify calculations of methane emissions from natural gas storage and transport equipment and facilities, and further advance LDAR work. Employing the PTZ laser-based methane alert system and drone leak detection, combined with multiple technical means such as in-vehicle mobile, hand-held terminals, and detection dogs, we will improve the timeliness of LDAR. We will also perfect emission control measures and the construction of emission control facilities for abnormal working conditions in the pipeline network.

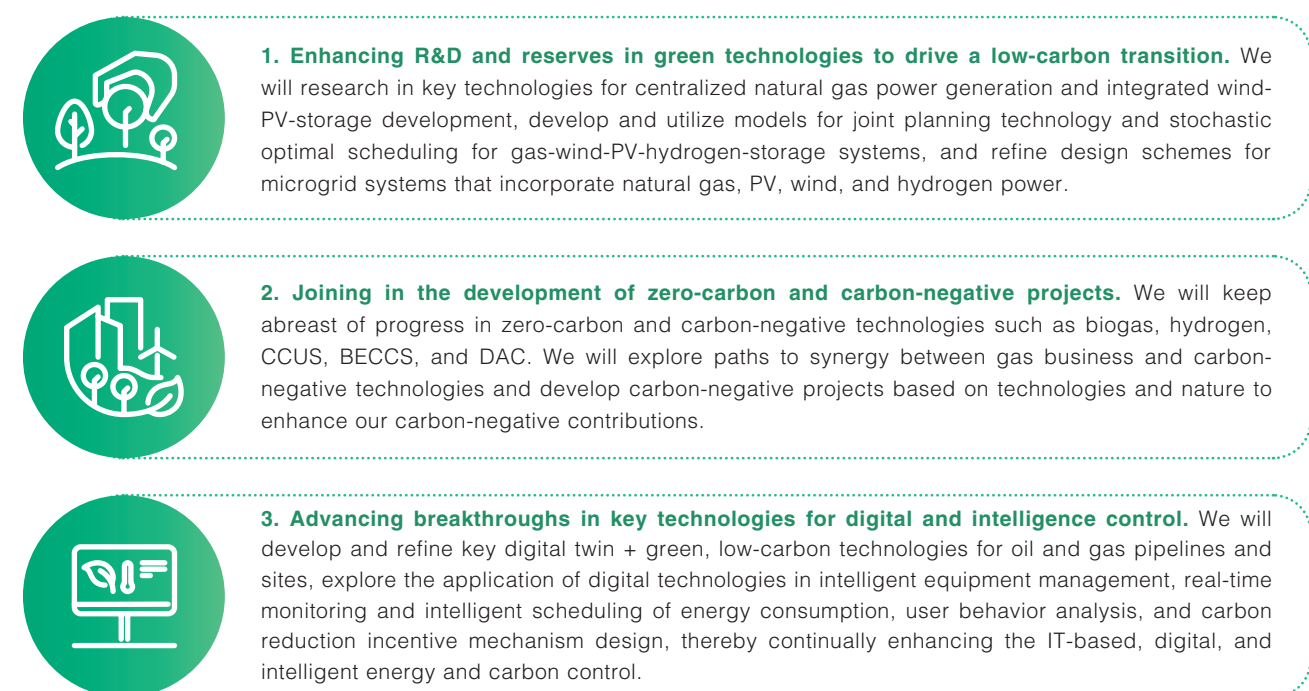




## Accelerating the Transition to Low-Carbon Energy and Expanding New Energy Business



## Fostering Green Technological Innovation to Cultivate Zero-Carbon and Carbon-Negative Drivers



## Improving the Green Low-Carbon System and Building a Green Brand







# Supporting Measures







### Enhancing Work Coordination and Strengthening Management of Carbon Peaking and Carbon Neutrality

The Sustainability Committee of the Board of Directors will coordinate carbon peaking and carbon neutrality and associated major issues. Its working group is tasked with organizational structure, mechanism, and support systems for carbon peaking and carbon neutrality, enforcing accountability of all parties, and advancing a green and low-carbon transition across all business areas.

### Intensifying Financial Support and Expanding Financing Channels

We will increase financial input, set up special funds for carbon peaking and carbon neutrality, standardize the management and use of funds, and improve the efficiency of capital utilization. We will ramp up efforts for matchmaking with financial institutions, and actively innovate green finance, encompassing green credit, green bonds (carbon neutral bonds), green funds, and carbon finance.



### Strengthening and Integrating Supervision into Remuneration Assessment

We will align remuneration with carbon performance to establish a long-term supervision mechanism for green and low-carbon development. We will assess progress in carbon peaking and carbon neutrality on a regular basis and make appropriate adjustments to relevant work when necessary in light of the external macro situation.

### Increasing Publicity and Training to Promote Green and Low-Carbon Principles

We will embed green and low-carbon principles into corporate operations to consolidate green and low-carbon culture. We will promote green and low-carbon office, advocate for green lifestyle, and explore the establishment of internal incentive mechanisms like carbon inclusiveness. We will ramp up efforts in training, introducing, and reserving talent for carbon peaking and carbon neutrality, providing professional training for them, and building a high-level professional talent team.





