



TCFD Disclosure & Climate Action Plan

Playing a Key Role in Climate Action as a Solar Leader
Driving a Low-Carbon Future Through Innovation
Empowering the Global Energy Transition

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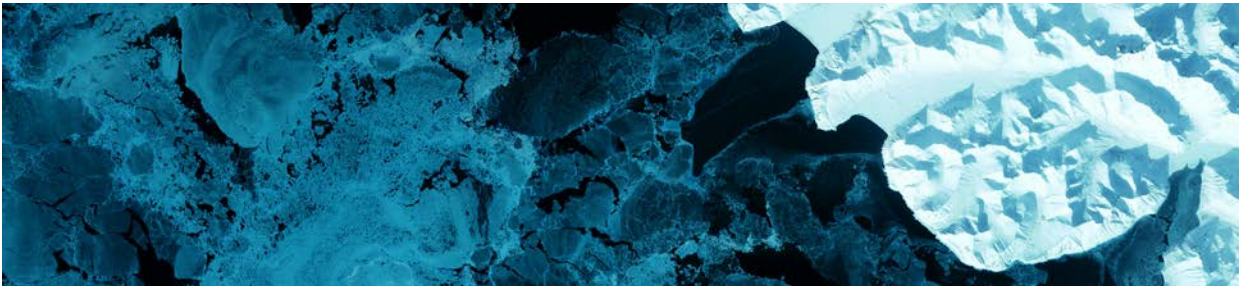
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About this report

Scope of the report

This annual report covers the period from Jan. 1 2024 to Dec 31 2024. To enhance its comparability and forward-looking relevance, certain sections may include data from previous years or forward-looking statements as appropriate.

Report boundary

The report encompasses the headquarters of Risen Energy Co., Ltd, along with its wholly-owned subsidiaries and major subsidiaries.

Data sources

The financial data in this report are derived from the 2024 Annual Report and 2024 Sustainability Report of Risen Energy Co., Ltd., and its public disclosures, official documents and consolidated statistics from headquarters and subsidiaries. It also reflects Risen Energy's strategic priorities, climate-related standards and initiatives, and stakeholder concerns.

Reporting references

The preparation of report is based on the following documents to meet the expectations of stakeholders:

- TCFD Recommendation of Climate-Related Financial Disclosures
- IFRS S2-Climate-Related disclosures
- 2024 Sustainability report of Risen Energy

Message from the Chairman

Chairman of the Board: Haifeng Lin

Risen Energy co., Ltd.

Let The Good Things Come Through Solar

In 2024, the photovoltaic industry has been increasingly important for the global energy transition. Facing dual pressure of rapid technological advancements and intensifying market competition, Risen proactively responds to the structural adjustments of the industry's capacity and follows the trends of development to mitigate market risks arising from technological shifts. With a stable and socially responsible management mode, the Company ensures its smooth operations while fostering mutually beneficial social relationships to contribute to the harmony between society and enterprises. Furthermore, we continue to advance the United Nations Sustainable Development Goals (SDGs), take active actions based on the Paris Agreement, and leverage our unique strengths in the solar PV sector to promote the leading role of innovation in energy transition and climate change, thus laying a solid foundation for global sustainable development.

Taking Concerted Efforts to Advance Sustainable Development

Risen views "Embrace a Brighter Future by Developing Photovoltaic Energy" as its ESG strategic vision and follows the sustainable development strategy of "RISEN: Responsible, Inclusive, Sustainable, Empowering, Navigating". We aim to achieve the goal of "Make the company an ESG benchmark in the photovoltaic industry" and integrate sustainable development principles into aspects of corporate governance and operational management to deepen our commitment to long-term sustainability. This year, the company earned multiple accolades, including: an ESG score of 65 from S&P Global, the "Golden Integration Award for Solar-Storage Green Synergy" from Energy magazine, recognition as a "Best Sustainable Development Practice Case for Chinese Listed Companies" by the China Association for Public Companies, and the EcoVadis Silver Medal for the Ninghai base. These achievements demonstrate that our ESG practice is earning more recognition across society.

Pursuing Higher Quality and Delivering Excellent Solutions

Regarding "Continuously improving the energy landscape and people's wellbeing through technological innovation", Risen continues to refine its institutional frameworks, mobilize necessary resources, and strengthen the foundation for innovation-driven growth through talent development, equipment upgrade, intellectual property protection and other aspects. In 2024, we launched the upgraded version of our heterojunction Hyper-ion module: "Hyper-ion Pro", which integrates cutting-edge technologies, including light-conversion technology, steel-mesh printing, and high-mobility target materials. The cell has achieved an average mass-production efficiency of over 26.61% with power output exceeds 740Wp. Featuring an industry-leading TCP (temperature coefficient of power) absolute value of -0.24%/°C and a bifaciality of approximately 90%, it delivers an additional energy yield of over 3% for power stations, which is a groundbreaking solution for the selection of centralized solar PV stations.

Following the Trends of the Time and Seizing upon Opportunities

Driven by both global trends and domestic policies, this year, we have further responded to stakeholders' concerns. For example, we conducted scenario analysis and financial impact assessments of climate risks for the first time, laying the foundation for optimizing resource allocation and mitigating risks. Moreover, we will continue to explore market opportunities, enhance corporate management philosophy and strategies, and advance technological innovation and process upgrades to contribute to the energy transition. Through these efforts, we aim to provide the world with new energy solutions that are more efficient, low-carbon, and safer.

Looking ahead, Risen will remain steadfast in its commitment to the philosophy of innovation, green, and sustainable development, and work together with value chain partners to explore new models that facilitate the optimization and transition of society. We will continue to leverage green photovoltaic energy to consolidate the foundation for sustainable development. As an explorer in the industry, we seek to make breakthroughs in technological innovation, inject momentum into carbon neutrality, and deliver attentive services with high-quality products. By doing so, we will realize our vision of "Light the World through Risen's Promotion of Photovoltaic Energy"!

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Highlights

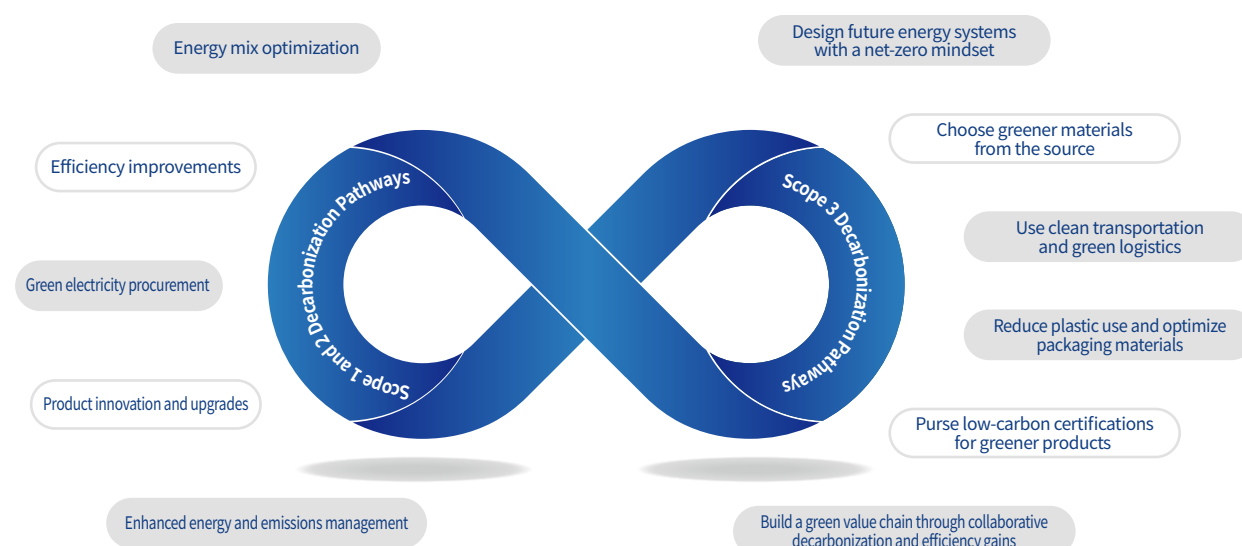
From Commitment to Action

As the impacts of global climate change intensify, clean energy is transitioning from a supplementary source to a primary one. As a company rooted in solar energy, we are at the forefront of this structural energy shift.

In response to the urgent global climate challenge, Risen has set a long-term vision: peak carbon emissions by 2030 and achieve net-zero across the full value chain by 2050. We've established a systematic carbon governance framework, embedding emissions targets into our overall strategy and operations.



Scope 1,2 and 3 Decarbonization Pathways



Progress toward carbon neutrality

Advocacy

- Joined the United Nations Global Compact (UNGC)
- Participated in Sedex to promote sustainable supply chains
- Become a member of the Solar Stewardship Initiative to support the low-carbon transition of the solar industry

Highlights

- Conducted climate risk scenario analysis and financial impact assessments
- **21** entities – including headquarters, manufacturing sites, and non-training subsidiaries all certified under ISO 14064
- Achieved certification for **3** low-carbon projects
- Obtained carbon footprint certification for **2** product lines
- **12** operation sites certified under ISO 14001 Environmental Management
- In 2024, delivered **18.07** GW of solar modules globally—equivalent to **112,449** GWh of clean electricity, saving **33.73** million tons of standard coal and offsetting emissions equivalent to planting approximately **899.6** million trees

The global shift towards a low-carbon economy has created unprecedented opportunities for Risen, prompting us to build a robust response system centered on risk identification, mitigation strategies, and adaptive mechanisms.

• Accelerating the development of high-efficiency, high-performance modules

As extreme weather events become more frequent, customers demand higher performance from solar modules. This drives us to continuously push the limits of key indicators such as conversion efficiency, anit-LeTID, and anti-PID performance to ensure stable power generation under harsher conditions.

• Integrated Solar and Storage Solutions for the future power system

We are actively integrating energy storage systems and transforming from a pure module manufacturer into a provider of integrated solar-plus-storage solutions.

• Globalizing Our ESG System to Strengthen Sustainable Competitiveness

By aligning with international standards and enhancing transparency, we aim to boost our visibility and influence in global green supply chains and investment networks.

• Digitalization and Intelligence for Smarter Operation

Through AI-based operations and maintenance, digital twins, and predictive maintenance, we enhance system stability and performance, maximizing asset value throughout the lifecycle while improving resilience to extreme climate impacts.

Product development driven by clean technology

Risen continues to advance solar cell and module technologies, becoming the first in the industry to achieve mass production of four key innovations at scale:

• **0BB (Zero Busbar) Cell Technology:** Eliminates front-side busbars to reduce metal shading and enhance light-to-electricity conversion efficiency, while also lowering silver consumption to support resource conservation.

• **210 Ultra-Thin Wafer Technology:** Reduces silicon material usage without compromising cell stability, improving raw material efficiency.

• **Metallization Process Using Less Than 5mg/W of Silver:** Approximately 37.5% lower silver content compared to mainstream TOPCon products, significantly reducing reliance on precious metals.;

• **“Risen Interconnect” Stress-Free Cell Interconnection Technology:** Enhances long-term module reliability and extends energy output across the product’s full lifecycle.

Notably, the company's Heterojunction (HJT) solar cells have achieved an average mass production efficiency of 26.61%, while the Hyper-ion HJT module reaches an average output of 740 Wp. In complex environments such as high temperatures and high-reflectivity surfaces, these modules deliver over 6% additional energy yield, demonstrating exceptional adaptability and end-use value.

Clean tech-driven business strategy

Risen is scaling high-efficiency PV production in Ninghai, Changzhou and Chuzhou while deepening its reach in North America, Europe and South America. Enhanced R&D funding targets heterojunction and perovskite breakthroughs to stay ahead technologically. Strategic alliances across the solar value chain will fortify supply-chain resilience and limit risk.

Indicators	Unit	2024	2023	2022
R&D Investment	RMB	511,757,892.57	675, 312,041.90	801,393,550.36
Numberof patent applications	/	286	161	159
Number of patents granted	/	175	105	164

Risen Eergy's R&D Investment and Patent Portfolio



About Risen Energy

risen



★ **Headquarter**

📍 **24** global marketing service centers

🔴 **10** production bases

Risen Energy Co., Ltd. was founded on December 2, 2002, and has its headquarters located in Ninghai County, Ningbo City, Zhejiang Province. The Company was listed on the GEM board of the Shenzhen Stock Exchange in September 2010 under the stock code 300118.

The Company focuses on the globalization business of new energy and new materials, and is mainly engaged in the business of crystalline silicon, solar cell wafers, modules, new materials, photovoltaic power plants, energy storage integrated systems and intelligent lamps and lanterns. The Company's photovoltaic module business is in a leading position in the photovoltaic industry worldwide, with shipment data ranking among the world's top for many years. The products are sold in many countries and regions such as the United States, Europe, South Africa, and Southeast Asia. As of the end of the reporting period, we operate a total of 10 manufacturing bases and 24 global marketing service centers. This expansion underscores our commitment to advancing global sustainability and meeting the growing demand for renewable energy worldwide.

Climate governance

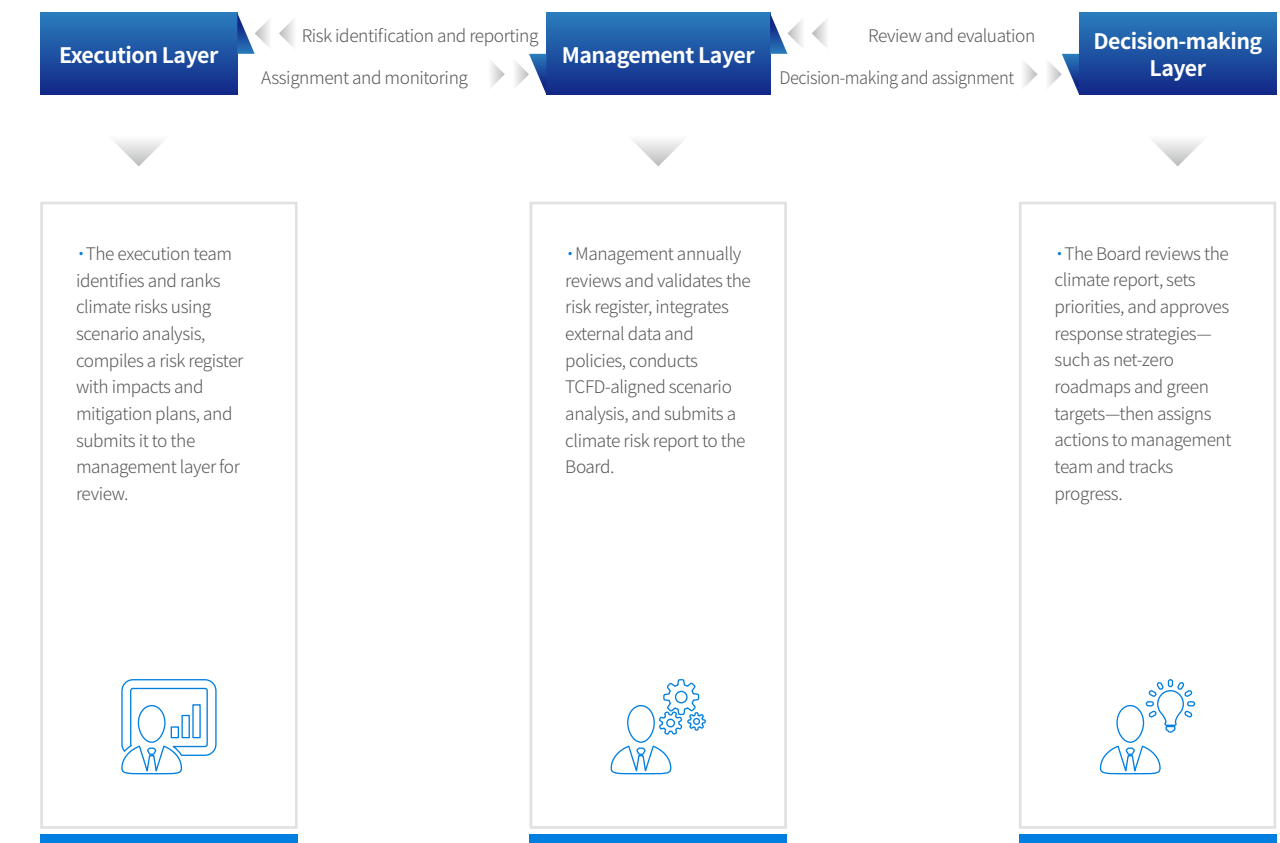
Risen has established a structured climate governance framework in alignment with TCFD recommendation, enabling effective oversight and management of climate-related risks and opportunities.

Governance structure and responsibility



Management mechanism

Responsibilities cascade from the Board of Directors to specialized working groups, ensuring orderly and effective climate change response.



In 2024, the Board of Directors reviewed two key proposals:

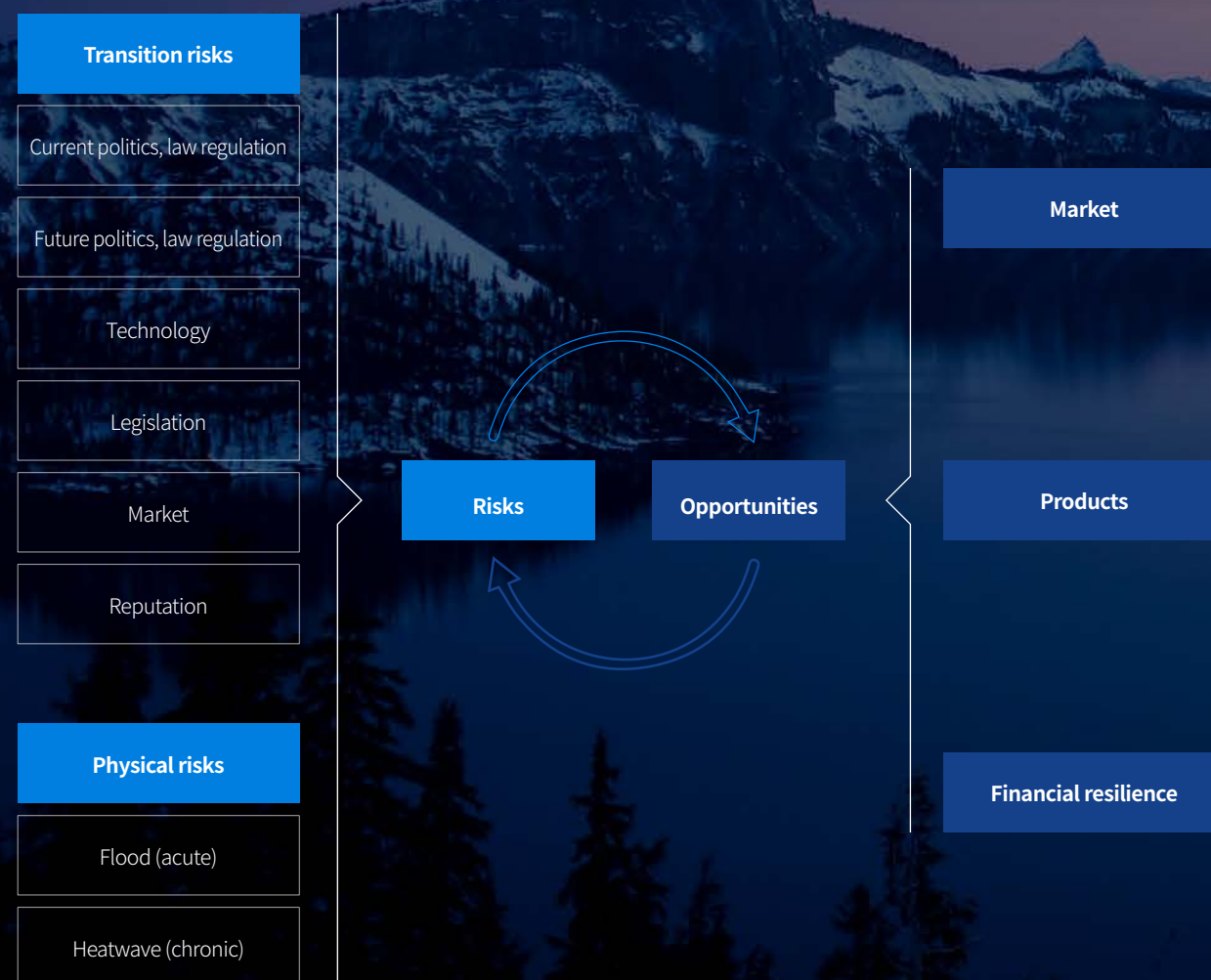
- 1.Climate Risk Control Procedure:** defined the process for identifying, assessing, responding to, and monitoring climate risks to enhance Risen's resilience.
- 2.TCFD disclosure and scenario analysis report:** disclosed climate-related information in line with the TCFD framework and conducted multi-scenario analysis to evaluate Risen's adaptive capacity under different climate pathways.

Climate strategies

As global climate change intensifies and the transition to a low-carbon economy accelerates, Risen has developed a science-based strategy to address climate-related risks and opportunities, ensuring long-term sustainability and business resilience.

Climate Risk Management

Identification of climate-related risks and opportunities is a core component of our sustainability strategy. In line with the TCFD framework, we assess physical and transition risks, as well as potential opportunities, and conduct analysis and quantification tailored to Risen’s business operations.



Climate Action Strategy

Long-term Vision

1. Invest in green R&D to lead the solar industry decarbonization.
2. Actively support global green development and join hands to tackle climate change.
3. Build a corporate image as a “climate action pioneer” to strengthen international presence and reputation.

Strategic Objectives

1. Achieve net-zero emission across the value chain by 2050.
2. Deliver high-efficiency solar solutions to accelerate decarbonization.
3. Strengthen adaptive capacity to extreme weather through innovation and collaboration.

Strategic Pillars

- 1. Green manufacturing**
 - Integrate smart and digital technologies to reduce energy use and waste.
 - Power facilities with renewable energy, aim for “zero-carbon facilities” at core site.
 - Promote end-life PV module recycling to enable a closed-loop value chain.
- 2. Sustainable supply chain**
 - Enforce green procurement standards and require supplier emissions disclosures.
 - Prioritize low-impact raw materials to reduce life-cycle carbon footprint of modules.
 - Deploy electric fleets and smart logistics to lower transportation emissions.
- 3. Low carbon product innovation**
 - Develop next-generation modules with improved conversion rates and reduced emissions per kWh.
 - Integrate PV with energy storage and micro grids to enhance renewable utilization.
 - Use cloud-based platforms for real-time energy and carbon tracking, enabling smart operations.
- 4. Climate partnerships & Community Engagement**
 - Partner with government, NGOs, and academia on climate innovation projects.
 - Promote internal awareness campaigns and foster a low-carbon culture.
 - Participate in shaping PV climate standards and share best practices globally.

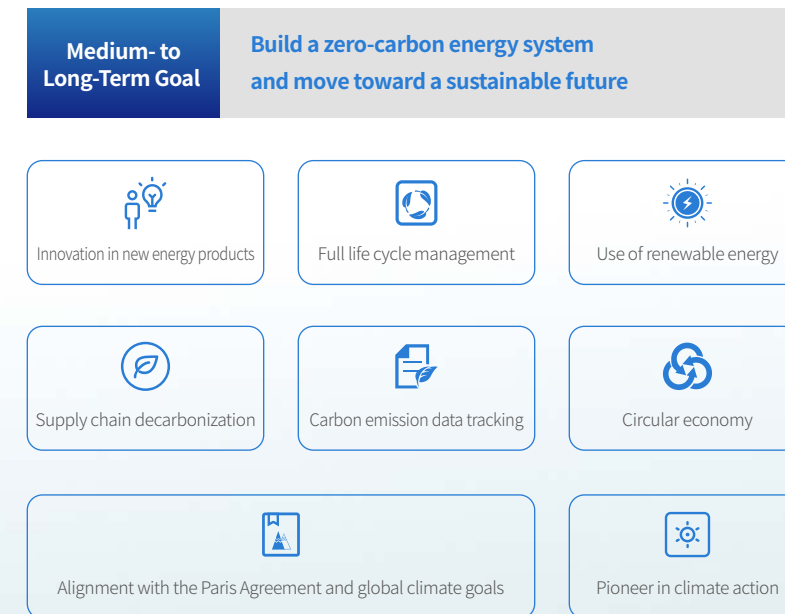
Monitoring and Disclosure

1. Monitoring and Disclosure
2. Quantify Scope 1, 2 and 3 emission using ISO 14064 and GHG protocol standards.
3. Disclose annual progress and changes through TCFD-aligned climate reports.

Carbon neutrality goal and pathways

Protecting our shared home, for a better future together

We are committed to upholding the Paris Agreement and taking proactive actions to address climate change by aligning with the Science Based Targets initiative (SBTi) to set science-based commitments and goals.



Risen's Role in the Global Low-Carbon Transition

The Core Role of PV Enterprises in Supporting a Low-Carbon Economy

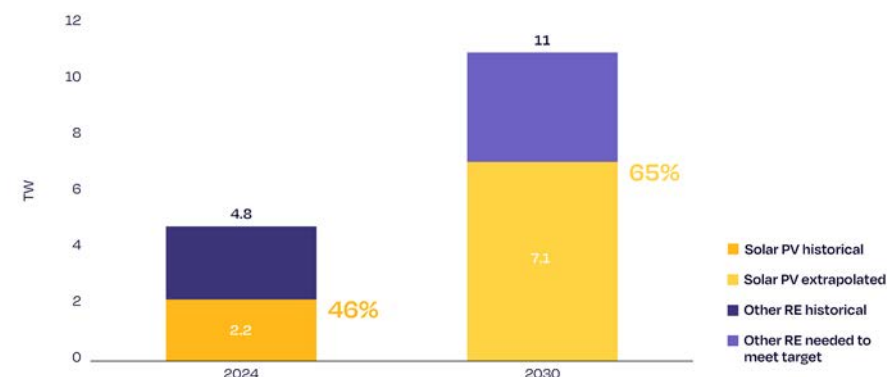
Climate change is intensifying, with more frequent extreme weather events accelerating the global low-carbon transition. As a vital clean energy sources, Risen plays a critical role in reducing emissions, optimizing the energy mix, and advancing sustainability.

Green and low-carbon development has become a global consensus. According to ECIU, by March 2025, over 150 countries and regions had proposed carbon neutrality targets. Among them, 32 countries, including Germany, have enacted carbon neutrality legislation, and 53 have issued supporting policy documents. Solar PV, with its high potential and scalability, is seen as a key enabler of carbon neutrality, offering strong long-term growth prospects.

From 2008 to 2004, Risen has been upholding the concept of green development, we have continuously driven innovation in clean energy technologies and expanded market reach.

Solar to lead the achievement of 11 TW global renewable target by 2030

Global installed renewable electricity generation capacity in 2024 and target for 2030

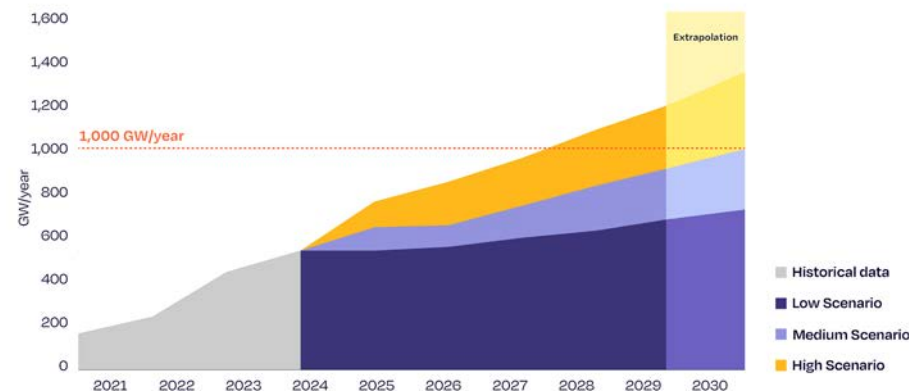


SolarPower Europe

Source: IRENA(2025), SolarPower Europe Global Market Outlook For Solar Power 2024-2028

Annual TW solar market likely to be reached by 2030

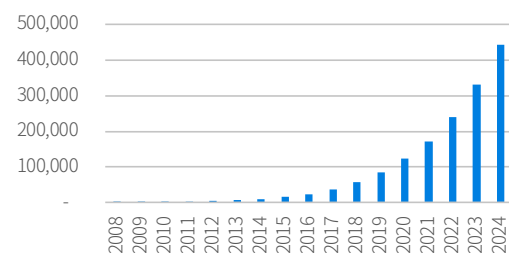
Global cumulative solar PV market scenarios 2025-2030



SolarPower Europe

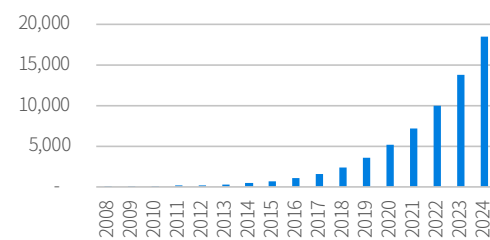
Source: Global Market Outlook for Solar Power 2025-2029

Generated cumulative clean electricity (GWh)

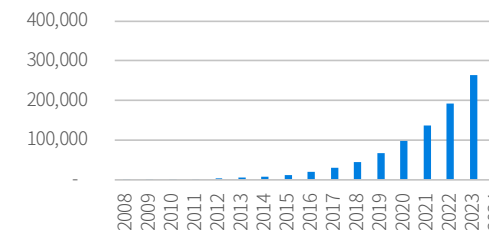


Generated cumulative clean electricity, benefiting thousands of households

Benefiting thousands of households (ten thousand)

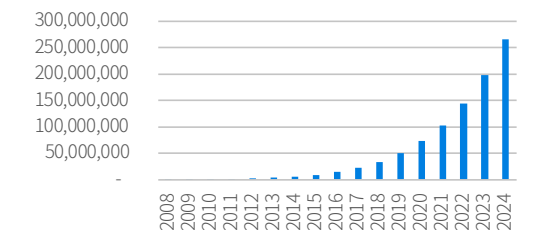


Cumulative trees planted (ten thousand)



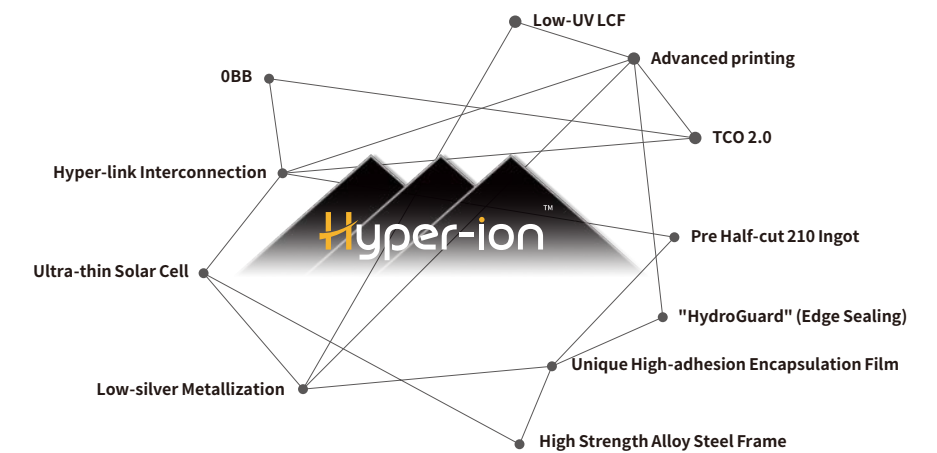
Promoted carbon reduction to support a green and sustainable ecosystem

Cumulative CO₂ emissions reduced (ten thousand tons)



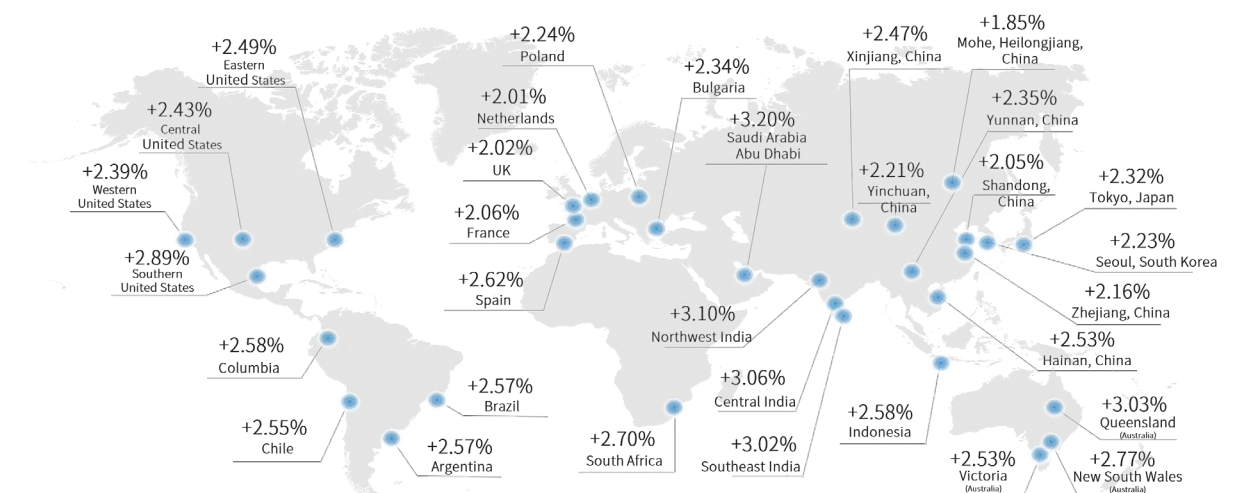
Providing society with affordable, more efficient, and lower-carbon clean energy technologies

The Hyper-ion HJT series modules have achieved an average mass production power output of 740Wp; pure silver consumption has been reduced to 5mg/W (37.5% lower than mainstream TOPCon). Combined with busbar-free technology, metallization costs are already below industry mainstream levels. In high-temperature and high-albedo scenarios, power generation gains exceed 6%, making them perfectly suited for emerging markets such as the Middle East and Southeast Asia.



With leading N-type technology, HJT photovoltaic modules deliver higher power generation

Ground-mounted PV Plant 740Wp+



HJT vs TOPCon (30-year cumulative power generation gain)

Climate Resilience

Integrating Risen's strategic planning and business operations, we assess the potential impacts of climate-related risks and opportunities across the Group headquarters, all operational sites, and manufacturing facilities. By formulating and implementing adaptation and mitigation actions, we aim to enhance our strategic planning, strengthen risk management, and build climate resilience.

Climate Risk Scenario Analysis

Globally, common approaches to climate change mitigation include setting carbon quotas and imposing carbon taxes to incentivize voluntary emission reductions under cost considerations. Through scenario analyses under different global warming pathways, Risen evaluates its transition and physical risks.

Transition Risks

In assessing transition risks, given our global business footprint, we conduct a comprehensive evaluation using the Network for Greening the Financial System (NGFS) climate scenarios: Net Zero 2050, Below 2°C, and Current Policies. Based on the internal carbon prices projected under each NGFS scenario, we calculate the ratio of the carbon cost required to achieve our Scope 1 & 2 emission reduction targets relative to revenue.

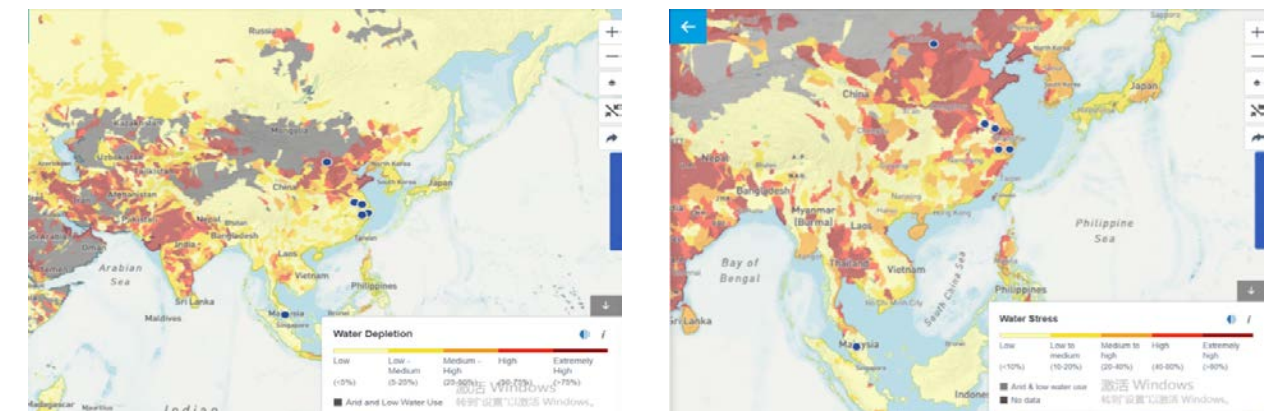
Risen adopts these three NGFS climate scenarios to simulate potential impacts. Transition risk considerations focus primarily on the rising cost of decarbonization and its impact on company revenues. Risen has committed to reducing Scope 1 and 2 greenhouse gas emissions by 50% by 2030 and achieving net-zero emissions across the entire value chain by 2050.

Overview Table of Risen's Transition Risk Scenario Analysis Results:

Scenario	Description	Financial impact	Percentage of impacted revenue
NGFS -Net zero 2050	Internal carbon prices: 2030: 200 USD/tCO ₂ e 2050: 600USD/tCO ₂ e	Our Scope 1+2 emission in 2024: 697,271.45tCO ₂ e Reducing operational GHG emissions (Scope 1 and Scope 2) by 50% in 2030; and achieving net zero across the value chain by 2050	2030: <0.49% 2050: <1.47%
NGFS -Below 2°C	Internal carbon prices: 2030: 45 USD/tCO ₂ e 2050: 140 USD/tCO ₂ e	Our Scope 1+2 emission in 2024: 697,271.45tCO ₂ e Reducing operational GHG emissions (Scope 1 and Scope 2) by 50% in 2030; and achieving net zero across the value chain by 2050	2030: <0.11% 2050: <0.34%
NGFS -current policies	Internal carbon prices: 2030: 20 USD/tCO ₂ e 2050: 20 USD/tCO ₂ e	Our Scope 1+2 emission in 2024: 697,271.45tCO ₂ e Reducing operational GHG emissions (Scope 1 and Scope 2) by 50% in 2030; and achieving net zero across the value chain by 2050	2030: <0.05% 2050: <0.05%

Physical Risks

In assessing physical risks, water stress is identified as the primary climate-related risk currently faced by the company. Risen uses historical climate data and the Aqueduct Water Risk Atlas adopted in TCFD scenario analysis to build a risk model. By inputting the geographical locations of our six manufacturing sites, we assess potential water risks under different scenarios for the year 2030.



Risen's Operational Sites – Water Stress Screening Model

For each scenario, event, and physical risk type, we calculate the likelihood, risk level, and impact severity of water-related risks at each manufacturing site. The quantified results are used to create a water risk matrix for Risen. Water scarcity is measured as the ratio of total water consumption to available renewable water supply.

The key findings are summarized as follows:

Operational Sites	Scenario	Risk level
		Water depletion
Ninghai, Zhejiang	SSP1 RCP2.6	Low - Medium (5 -25%)
	SSP5 RCP8.5	Low - Medium (5 -25%)
Changzhou, Jiangsu	SSP1 RCP2.6	Low - Medium (5-25%)
	SSP1 RCP8.5	Low - Medium (5-25%)
Yiwu, Zhejiang	SSP1 RCP2.6	Low - Medium (5-25%)
	SSP1 RCP8.5	Low - Medium (5-25%)
Chuzhou, Anhui	SSP1 RCP2.6	Low (<5%)
	SSP1 RCP8.5	Low (<5%)
Inner Mongolia	SSP1 RCP2.6	Low (<5%)
	SSP1 RCP8.5	Extremely High (>75%)
Malaysia	SSP1 RCP2.6	Low (<5%)
	SSP1 RCP8.5	Low (<5%)

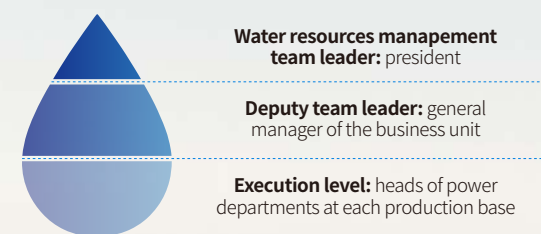
The Inner Mongolia manufacturing site faces significant water depletion stress, with extremely high risk levels under both the optimistic (SSP1-RCP2.6) and pessimistic (SSP5-RCP8.5) scenarios.

Mitigation Measures:

1. Promote water-saving processes, such as adopting closed-loop cooling water systems and reclaimed water reuse technologies to reduce water consumption per unit of product.
2. Implement process optimization and equipment upgrades to enhance water-use efficiency.
3. Establish long-term water supply agreements with local governments and water utilities to secure prioritized water allocation during dry seasons.

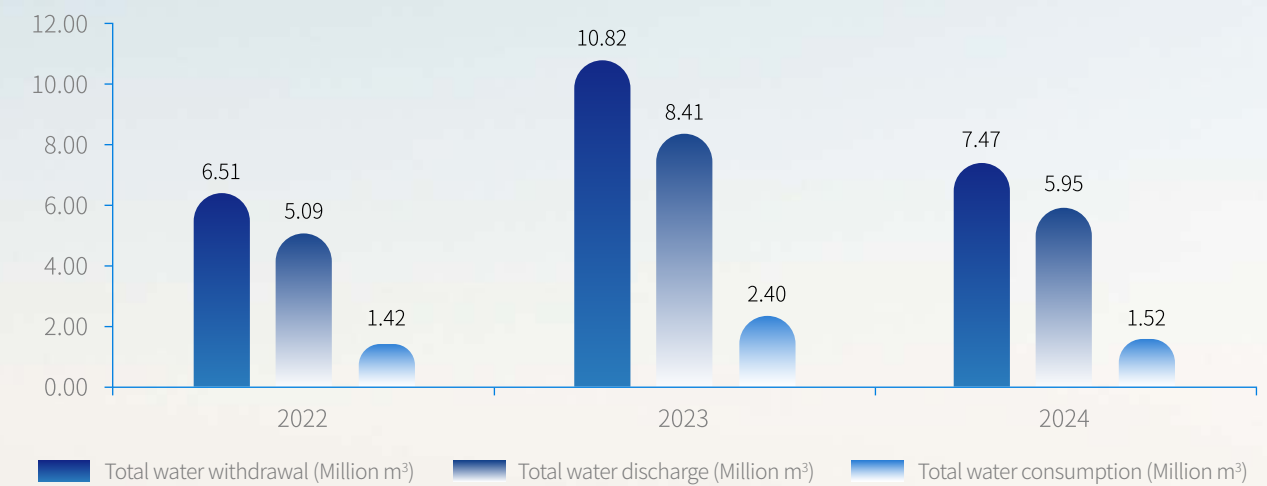
Water Stewardship

We have established a Water Management Task Force, led by our President and senior executives, to integrate water management into corporate strategies. The Task Force oversees reports from the Production Technology Center, focusing on assessing water use to identify efficiency improvements, setting reduction targets, promoting recycling technologies, and developing action plans to reduce consumption and improve wastewater quality, ensuring continuous improvement.



Risen Energy's Water Stewardship Structure

We continue to enhance our internal systems for water resource management, officially implementing the Risen Energy Water Stewardship Policy, which provides clear guidelines for regulating water stewardship practices. To effectively operationalize our sustainable development strategy, we have designed and launched an ESG assessment framework, known as the "5S" evaluation model, during the reporting period. This model encompasses all ESG topics, including water stewardship. The "5S" evaluation model scores water stewardship initiatives across five dimensions: assessment, governance, practice, results, and improvement, ensuring effective oversight and incentives throughout the entire process from policy establishment and goal setting to the implementation of measures.



Water Resource Data of Risen Energy

Climate Risk and Opportunity Management

Risen attached great importance to compliance and risk management. Based on mainstream international compliance and risk management standards, the Company has established a risk management system and review mechanism that is suitable for its actual operations, ensuring compliance and risk management throughout business activities and laying a solid foundation for its steady development.

We have built a "Three Lines of Defense" risk governance framework. The first line led by business units heads who identify, own, and manage risks that could impact business objectives. s monthly. The second line consists of the Strategic and Sustainable Development Committee, the Remuneration and Performance Management Committee, the Board Secretary, and other business support departments such as HR, finance, and legal. The third line is the internal audit function that consists of supervisory departments, including the Board of Supervisors, the Audit Management Committee, and the audit department.



Risen's "Three Lines of Defense" risk governance framework

Risk Management

We have formally integrated climate change risks into our corporate risk management system, establishing clear management processes and a risk/opportunity rating matrix. Our management processes follow three key steps: (1) identifying climate-related risk factors, (2) assessing their potential impacts on business operations and financial performance, and (3) determining risk levels and priorities. The rating system evaluates both likelihood and degree of impact to generate comprehensive risk/opportunity scores and classifications, which guide corresponding control measures. Moving forward, we will continue optimizing these processes and standards to effectively address climate challenges while capturing emerging opportunities.



Risen's Risk Management Processes for Climate Change

Risk Control Principle

Risen follows a "prevention-first, risk-prioritized" approach, focusing on physical and policy risks such as extreme weather and using a tiered response mechanism to ensure major risks are escalated to the Strategic and Sustainable Development Committee. Through climate scenario analysis, we conduct dynamic monitoring and adjust strategies in real time. ESG factors are integrated into key decisions—including capital expenditure, supply chain planning, and product design—to ensure high-level risks and opportunities are part of our strategy. We also promote full lifecycle management of green products and low-carbon technologies to drive value from R&D to market.

Rating dimension/score	Likelihood	Level of impact
1	Highly unlikely	Low
2	Unlikely	Medium
3	Possible	Medium-high
4	Likely	High
5	Almost certain	Critical

Composite score = Likelihood + Impact	Risk level	Control prinaples
Score $\geq$ 7	High	Risk elimination, reduction or transfer through institutional controls with dedicated departments/personnel assuming primary manapement responsibility
4 $\leq$ Socre<7	Medium	Risk reduction/transfer through established control systems wth routine monitoring
Socre $\leq$ 3	Low	Routine monitoring with periodic review

Risen Energy's Criteria and Control Principles for Risk and Opportunity Rating of Climate Changes

Risk Identification and Response Strategies

Transition Risks

Risen identified key climate-related transition risks in 2024 and developed corresponding response measures through its internal risk assessment process.

Type	Factor	Description	Time frame	Financial impact	Value chain stages covered	Risk level
Current regulation	Changes in energy prices	The rise in traditional energy prices leads to increased production and transportation costs.	Long term	Cost increase in supply chain and operation	Energy cost fluctuations cause variability in production and transportation costs across the value chain.	Important
Emerging regulation	Policy changes in western countries	1. Carbon emission regulations, renewable energy policies, and trade barriers 2. Changes in single market policies 3. Higher entry thresholds for low-carbon product demand 4. Low-carbon compliance management in the supply chain	Short and mid term	Increased financing and compliance costs	Increased environmental requirements from downstream buyers drive upstream suppliers to meet low-carbon standards, raising green supply chain costs.	Important
Technology risk	Technology iteration	1. Rapid tech advances reduce existing tech competitiveness 2. Extreme weather lowers module reliability 3. Lagging digital O&M technology 4. Energy storage or grid issues affect stability 5. High manufacturing carbon emissions impact market acceptance	Short and mid term	Increase in product R&D costs	1. Rapid tech iteration may obsolete existing products, forcing supply chain upgrades to stay competitive 2. Companies must promote green manufacturing, innovation, and supply chain collaboration to enhance climate resilience and market responsiveness	Highly Important
Legal risk	Environment-related litigation	1. Improper waste treatment risks legal penalties 2. Improper disposal of modules/batteries causes pollution and lawsuits 3. Non-compliance with carbon rules leads to taxes and litigation	Short and mid term	Increase in operation costs	Environmental lawsuits impact the entire PV value chain, affecting compliance, product design, project development, financing, and market access, increasing costs and reputational risks.	Important
Market risk	Changes in demand	Carbon pricing and tariffs across regions increase financial costs.	Mid term	Increase in product R&D costs	Rising demand for low-carbon products pressures the industry, leading downstream manufacturers to prefer products with lower carbon footprints, affecting market performance.	Important
Reputational risk	Expectation of stakeholders	1. Environmental violations hurt public and investor perception 2. Supplier environmental and labor issues damage reputation	Short term	Increase in management costs	This causes reputational damage, customer loss, higher financing costs, potential supply chain disruptions, and decreased market confidence, weakening competitiveness and sustainability.	Important

Impacts of transition risks on business model and value chain

Transition Risks Response Strategies

Current regulation

1.Improved logistics efficiency and load utilization

Since 2021, Risen has adopted large-format module technology (2384×1134mm) and, by 2023, jointly promoted standardization with nine leading industry peers. Large modules enhance power and efficiency, improve silicon utilization, and maximize container space, reducing transport frequency and logistics carbon footprint.

2.Use of cleaner transport modes

The company prioritizes low-carbon logistics and actively promotes multimodal transport, integrating road, rail, and waterway. This improves long-distance freight efficiency and last-mile delivery, reducing energy consumption and emissions.

3.Energy use optimization

We implement energy-saving measures across operations, such as controlling lighting, adjusting HVAC settings, and optimizing equipment frequency, to reduce energy use and greenhouse gas emissions during production.

4.Energy structure optimization

We actively increase the share of renewable energy. During the reporting period, we completed four rooftop solar and storage projects in Chuzhou, Changzhou, and Nanbin, totaling 134.75 MW of PV and 13.75 MW of storage capacity—reducing reliance on fossil fuels and lowering emissions.

Legal risk

1.In compliance with ISO 14001 requirements and our Internal Audit and Management Review Procedures, we conduct systematic annual identification of environmental factors to accurately identify and control relevant factors, while regularly updating our environmental factors register to ensure effective risk management.

Performance Highlights

- As of the end of the reporting period, **12** operations (including Ningbo HQ, manufacturing bases and/or subsidiaries) have obtained ISO 14001 certification.
- The reporting period saw **76** internal audits covering hazardous chemicals, solid waste, wastewater, waste gas, and environmental facilities, along with **17** external audits that identified **65** findings, all of which achieved **100%** rectification.

2.Durability, After-Sales, and Recycling

Our products undergo enhanced testing to ensure stable performance in harsh environments and extended service life. During the reporting period, the Hyper-ion series modules passed IEC's thermal cycling test from -60°C to 120°C. We maintain a strong service network to quickly address product issues, prioritizing repair over replacement to reduce resource waste and extend product life span. We also comply with the EU WEEE Directive and actively participate in PV Cycle's recycling program to ensure proper disposal and reuse of end-of-life modules.

3.Carbon Footprint Certification

We actively pursue product carbon footprint certifications to enhance market access and competitiveness. Our Hyper-ion series modules have obtained multiple certifications, including EPD and France's ECS carbon label.

Emerging regulation

1.Policy Monitoring & Compliance

- We enhance communication with industry associations and international organizations to stay updated on policies, participating in 146 industry events in 2024.
- The overseas sales and trade remedy team has established compliance systems to ensure legal conformity in product design, R&D, and sales.

2.Diversified Market Strategy

- We balance domestic and overseas markets to reduce dependence on any single region.

Certification



- Priority is given to markets with stable policies and long-term renewable energy plans.

3.Tech Upgrade & Product Compliance

We proactively adopt low-carbon technologies and high-efficiency modules to meet carbon tax and footprint requirements, and adjust certifications to match market-specific regulations.

4.Green Supply Chain Management

We strictly control hazardous substances, requiring annual third-party test reports from suppliers to ensure compliance with EU REACH and RoHS standards.

High-performance of Products



Market risk

Based on our 2022 Carbon Emission Management Policy, we released the Group Electricity Management Regulation during the reporting period. It sets energy-saving targets and highlights power supply security and demand-supply analysis. To date, 21 entities (HQ, factories, and non-trading subsidiaries) have achieved ISO 14064 certification.

Through technology and process improvements, we reduce resource use and waste, optimize logistics to cut transport energy, and extend product life to lower environmental impact. We also actively pursue green certifications to offer efficient, low-carbon energy solutions for global clients.

Reputational risk

1.Environmental Compliance

We've established comprehensive environmental policies at the group level covering water, power, emissions, noise, waste, and permits. Under this framework, 94 site-level regulations guide daily environmental practices at each production base. We enhance transparency by disclosing actions in our ESG report.

Performance Highlights

We recorded **0** cases of environmental compliance violations or administrative penalties.

ISO 14001 certificates were obtained by **12** operations including Ningbo HQ, manufacturing bases and/or subsidiaries.

Environmental protection investments totaled RMB **118.91** million; **46** environmental training sessions were conducted with **4,324** participants and **78** training hours.

3 "National Green Factory" certificates were awarded.

2.Supplier Due Diligence

We combine surveys and document reviews to conduct monthly supplier evaluations based on a standardized form, considering both technical capacity and ESG factors. We also respond to global expectations by incorporating environmental and human rights criteria from the German Supply Chain Act, EU Battery Regulation, CS3D, and UN Guiding Principles into our audit tools—ensuring supply chain compliance and sustainability.

Performance Highlights

In 2024, we conducted **124** ESG due diligence investigations on suppliers, covering all **77** key suppliers in the photovoltaic sector and the energy storage sector. Among them, we completed a 2nd party on-site assessment for **1** supplier and desk assessments for the remaining **76**.

We also carried out third-party independent reviews of suppliers at the request of downstream customers, conducting Sedex 3rd party assessment for **1** supplier in each of the **5** categories of key upstream suppliers (glass, junction boxes, solar cells, films, and frames).

Technology risk

1.HJT Technology & Patents

We hold over 500 patents, including busbar-free HJT and low-temperature stress-free interconnection. Compared to TOPCon and PERC, HJT offers over 3% higher power output for power plants.

HJT vs TOPCon vs BC

Mass Production Power			
HJT 730Wp	>	TOPCon 715Wp	>
			BC 650Wp

Measured Bifaciality			
HJT 90%	>	TOPCon 80%	>
			BC 65%

1% bifaciality increase → ≈0.1-0.15% generation improvement.

Power Temperature Coefficient			
HJT -0.24%/°C	>	BC -0.26%/°C	>
			TOPCon -0.29%/°C

0.01% reduction in power temperature coeff. absolute value → ≈0.5% power generation improvement.

30-year Power Retention			
HJT 90.3%	>	BC 88.85%	>
			TOPCon 87.4%

2.Quality & Reliability Control

Key quality measures are integrated into the entire production process to ensure product stability, reliability, and safety. We conduct reliability tests such as PID and LID, improve material durability through coating and encapsulation, and use smart monitoring for real-time performance tracking.

3.Smart O&M with IoT & Big DataIoT and big data

Technologies are applied to enhance smart plant management. Predictive maintenance systems help detect module and inverter faults early.



4.Advanced Storage & Grid Tech

We develop high-energy-density, long-lifespan storage solutions and smart inverters with enhanced voltage and frequency regulation for better grid integration.

5.Green Manufacturing & Low-Carbon Supply Chain

We adopt low-energy materials and processes, carry out carbon footprint certifications (e.g., LCA), and partner with green suppliers to reduce upstream emissions.

Physical Risks

Risen identified key climate-related physical risks in 2024 and developed corresponding response measures through its internal risk assessment process..

Type	Factor	Description	Time frame	Financial impact	Value chain stages covered	Risk Level
Acute physical risk	Flood	· Equipment damage from flooding leads to increased maintenance costs and reduced asset availability.	Mid term	Facility damage	· Floods may interrupt production or transportation, causing delivery delays.	Important
		· Flooded assets may halt operations, causing revenue loss.			· Supply chain disruptions result in higher logistics costs and untimely deliveries.	
Chronic physical risk	Heat wave	· High temperatures increase electricity and water use for cooling, while reducing cooling system efficiency—raising operational costs.	Short term	Increase in energy consumption and operation costs	· Prolonged heat reduces equipment efficiency, accelerates material degradation, and raises production and transport costs. These impacts weaken value chain stability and overall profitability.	Important
		· Greater demand for water and energy may lead to supply shortages.			· Construction delays due to site inaccessibility increase project timelines and costs.	

Physical risk identification and assessment table

Physical Risks Response Strategies

Flood

- 1.Enhance flood protection with backup power, drainage systems, and submersible pumps; develop contingency plans and ensure sufficient emergency supplies.
- 2.Strengthen production planning and delivery contingency measures to avoid breach penalties due to delays.

Heat wave

- 1.Increase self-generated power facilities to improve climate resilience; increase related trainings for employee.
- 2.Implement weather alert systems and issue real-time health advisories for outdoor and high-temperature work to reduce heat-related risks.
- 3.Enforce safety and health protocols for high-temperature operations to protect workers.



- 4.Increase water recycling to mitigate the impact of extreme heat on water supply and consumption.

Base	Water-saving Project	Implementation Measures	Water Recycled (Yes or No)
Changzhou	Replacing tap water with reclaimed waterfor CVD exhaust scrubbers	Utilize reclaimed water devices to recover wastewater from slow-lifting wastewater, exhaust gas and waste-water, and dilute acid wastewater; reuse reclaimed water in CVD exhaust scrubbers	Yes
	Wastewater reuse for chemical preparation	Use water from sedimentation tanks to replace tap water for lime preparation	Yes
Nanbin	Reduce water costs for CVD exhaust scrubber treatment	Install two tap water booster pumps directly connect-ed to the incoming tap water pipe to boost pressure into the original RO pipeline, replacing RO water for CVD exhaust scrubbers treatment in Workshop 801	No
	Wastewater reuse for chemical preparation	Use waterfrom sedimentation tanks to replace tap water for lime preparation	Yes
	ROR concentrated water reuse	Change direct discharge of ROR concentrated water to collection for cooling tower use	Yes
Chuzhou	Phase I and II ROR concentrated water recovery project	· Connect the Phase II ROR concentrated water tank in parallel with the Phase I ROR recoverysystem. · Activate connecting valves to divert excess concentrated water from Phase II RO to Phasel's treatment capacity when needed, avoiding overflow waste.	Yes
	Wastewater reuse for chemical preparation	Use waterfrom sedimentation tanks to replace tap water for lime preparation	Yes
Overall, the proportion of reused water in the above projects is 86.5%, saving 1,112 tons of water daily.			

Risen Energy's Water-Saving Proiects in 2024 (Excerpt)

Opportunity Identification and Response Strategies

Resource Efficiency

1.Development of High-Efficiency PV Products

Risen has long been dedicated to the R&D and manufacturing of high-efficiency crystalline silicon solar cells and modules. The company has built robust technical capabilities and industry-leading production capacity in high-efficiency PV technology.

·Average mass production efficiency of HJT cells exceeds 26.61%, with the Hyper-ion HJT module reaching 740Wp.

·Silver consumption reduced to 5 mg/W (37.5% lower than mainstream TOPCon), and metallization cost is now below industry average through busbar-free technology.

·In high-temperature and high-albedo environments, energy yield outperforms TOPCon by 6.04%, making it ideal for emerging markets such as the Middle East and Southeast Asia.

2.Adoption of More Efficient Manufacturing

·Risen has implemented smart manufacturing strategies, including automation, digitization, and visualization across production lines, workshops, and facilities. This integration of digital and industrial systems has led to green factories and digital workshops, resulting in optimized processes, improved quality, reduced costs, and enhanced low-carbon production.

·The company tackled HJT industrialization bottlenecks and became the first in the industry to build a full-process smart manufacturing system across wafers, cells, and modules.

a).Digital twin system with visibility into 116 key process nodes.

b).Production cycle reduced from 72 to 48 hours; breakage rate reduced to 0.03%.

c).Integrated scheduling model across all three segments, with an OEE of 96.5%.

·A central smart decision-making hub has been established using industrial big data platforms, integrating real-time data from equipment and sensors.

a).Downtime reduced by 87% (MTTR < 15 min).

b).CTM loss optimized to 1.8% (industry benchmark: 2.5%).

c).Auxiliary material inventory turnover improved by 40%, saving over RMB 20 million annually in storage costs.

Products and Services

1.Green Product Innovation

Recognizing the critical role our products play in supply chain decarbonization, Risen integrates eco-design principles from the R&D stage. Continuous product innovation supports both emission reductions and rising customer demand for low-carbon solutions.



Energy storage

Refrigerant replacement

We switched to hydrofluoroolefin (HFO) refrigerant R-513a, which has zero ozone depletion potential (ODP) and low global warming potential (GWP), replacing R-134a in positive-displacement,direct-expansion medium-temperature commercial and industrial chillers.

System efficiencyimprovement

We adopted an ANPC+DPWM hybrid modulation strategy, significantly enhancing the overall efficiency of energy storage converters. For example, a 1,750 kW energy storage converter using this technology achieved a0.5% efficiencyincrease, saving 38,000 kWh annually per unit and reducing carbon emissions by 30 metric tons.



Power plant

Humidity adaptation

We implemented moisture-proof measures and humidity monitoring in high-humidity environments to ensure electrical equipment performance and longevity.

Temperature management

We designed heat dissipation solutions and temperature monitoring for Py prolects to maintain modules within optimal temperature ranges, thereby improving power generation efficiency.

Extreme weather resilience

We prioritized selecting project sites with flat, open terrain that are far from natural disaster-prone areas; utilized wind-resistant,waterproof, and corrosion-resistant equipment,while reinforcing structural designs forequipment supports and cables to enhance disaster resilience;establishec a robust O&M management svstem.with regularmaintenance to ensure stable operation and extended equipmentlifespan under extreme conditions.

2.Low-Carbon Product Lifecycle Management

Risen incorporates circular economy principles across the entire product lifecycle—from design, manufacturing, logistics, to end-of-life. Cross-departmental lifecycle management system promotes carbon reduction throughout:

·R&D focuses on material-efficient design.

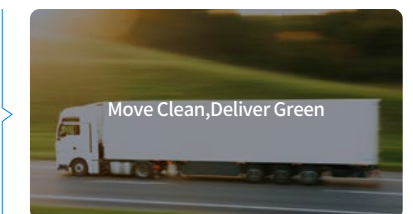
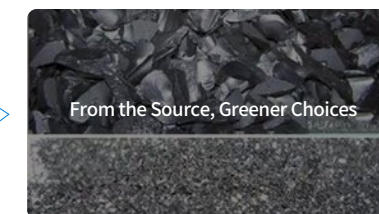
·Production emphasizes lean manufacturing and higher resource efficiency.

·Warehousing and logistics departments optimize inventory and reduce transport emissions.

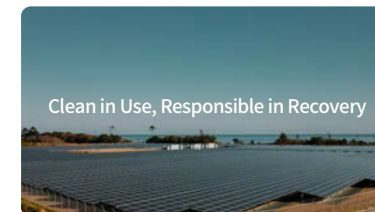
·Waste is properly recycled and managed.

·Product longevity and after-sales service are enhanced to reduce environmental impacts.

·We actively pursue national and international green certifications such as China's Green Product Certification, Green Supply Chain, Green Factory, France's carbon footprint certification, and global EPDs to ensure top-tier environmental performance throughout the product life.



Product Life Cycle Management



Market

1.Competitive LCOE Performance

The Hyper-ion 700W+ HJT modules, based on 210mm ultra-thin wafers, demonstrate excellent leveled cost of electricity (LCOE) performance, aligning with global demand for high-efficiency solar solutions.

2.Energy Storage Integration

Risen Energy offers full-stack energy storage solutions—from BMS, PCS, EMS to DC and MV-integrated systems—providing customers with vertically integrated, high-safety, high-density, and high-reliability products.

3.Value Chain Collaboration

We have developed a vertically integrated supply chain covering silicon material, wafers, cells, modules, power plant construction, and energy storage systems. Through joint ventures and equity partnerships, Risen enhances collaboration with supply chain partners to secure supply stability. Additional strategies such as co-development with suppliers, long-term procurement contracts, and logistics optimization help control costs across the chain.



Financial Risks of Climate Change

Description	Type	Financial assessment	Financial impact	Percentage of impacted revenue
Increased PV market	Market changes (Opportunity)	Our HJT product have set a new record low for the industry and further reduced its environmental impacts. As the carbon footprint of products is increasingly addressed, the market share of HJT will gradually increase, driving the revenue growth of the Company. According to the normal industry sales price, the prices of HJT in 4 years are (with year-end price as reference, unit: RMB/W): 2025: 1.37 2026: 1.32 2027: 1.29 2028: 1.26	According to the Company's internal capacity forecast, the revenue generated from HJT in the next 4 years is (10 million RMB): 2025: 5.33 billion 2026: 5.56 billion 2027: 5.84 billion 2028: 6.13 billion The average annual increase will be 8.4 billion RMB.	>20% (Refer to the data of 2028)
			The estimated production line input cost in 2025 is 0.345 billion RMB.	<20%
Extreme precipitation	Physical changes (Risk)	We have calculated the investment in storm prevention of all bases and estimated losses in the event of extreme rainfall with the reference of past data.	Our Bases have suffered three storm losses in the last two years, with an average loss of RMB 0.425 million. We have spent a total of 2.40 million RMB on the prevention of storm and floods in the past 4 years, mainly for the purchase of flood prevention materials.	<0.01%
Carbon tax	Regulation (Risk)	In order to fulfill SBTi's carbon emission (Scope 1 and Scope 2) reduction requirements, we will need to add 549.27 million kWh of new green power in 2030 compared to 2023 (assuming total electricity consumption remains unchanged). According to our ESG executive team calculation, the price of green power will be 0.015 RMB/kWh higher compared to thermal power.	Total electricity consumption in 2024: 1,246,805,570 kWh Green electricity consumption in 2024: 179,536,630 kWh In 2024, we had already reached the SBTi emission reduction target, with no additional carbon tax. According to the calculation of the proportion of green electricity, the amount of carbon tax from 2025 to 2030 will be 7.062 million RMB.	<0.1%



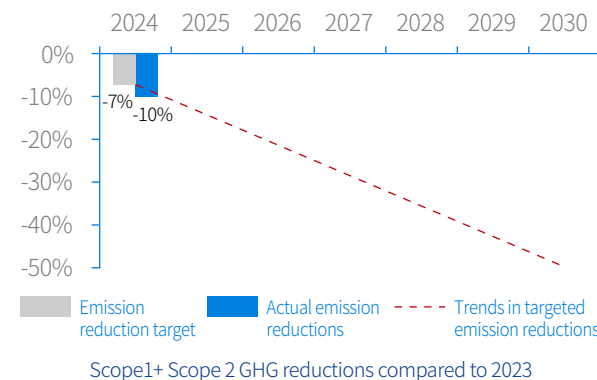
Indicators and targets

In response to China's national “carbon peak” and “carbon neutrality” strategy and aligned with the Paris Agreement, Risen has set science-based climate targets following the SBTi guidelines: to peak carbon emissions by 2030 and achieve carbon neutrality by 2050.

Indicators	Targets
Greenhouse gas emissions	- By 2030, to reduce GHG emissions from Scope 1 and Scope 2 by 50% - By 2050, to achieve net zero emissions across the entire value chain
Proportion of renewable energy use	- By 2030, the proportion of renewable energy use will reach 20% - By 2050, the proportion of renewable energy use will reach 100%

2024 GHG Emissions Target (Scope 1 & Scope 2):

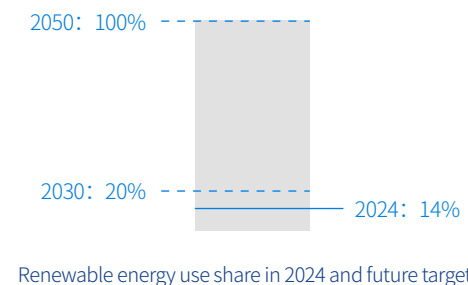
In 2024, we successfully achieved the emission reduction target set in 2023 (the target was to reduce combined Scope 1 and Scope 2 emissions by **7%** year-on-year annually between 2023 and 2030). This year, our total Scope 1 and Scope 2 emissions decreased by **10%** compared to 2023.



Status: Achieved

2024 Renewable Energy Target

Reached a total installed PV capacity of **134.75**MW and energy storage capacity of **13.75**MWh. Achieved **14%** renewable penetration.



Status: In progress

2024 Scope 3 GHG Emissions Progress

We completed the first full Scope 3 inventory across all manufacturing sites, covering indirect emissions throughout the product life cycle. In collaboration with third-party experts, we identified eight major Scope 3 categories relevant to our business.

01 Purchased goods and services

05 Buesiness travel

Capital goods 02

Employee commuting 06

03 Upstream transportation and distribution

07 Downstream transportation and distribution

Waste generated in operations 04

End-of-life treatment of sold products 08

Baseline data collection and preliminary emission calculations have been completed for all eight categories. Third-party verification is underway to establish the 2024 Scope 3 emissions baseline.

Going forward, we will further analyze each category in terms of emission intensity and reduction potential, and develop prioritized mitigation strategies and long-term reduction targets based on scientific approaches.

Historical GHG Emissions Performance

Risen continues to improve carbon management through technological innovation and energy structure optimization. As of 2024, 100% of our headquarters, manufacturing bases, and 21 non-trading subsidiaries have obtained ISO 14064 certification.

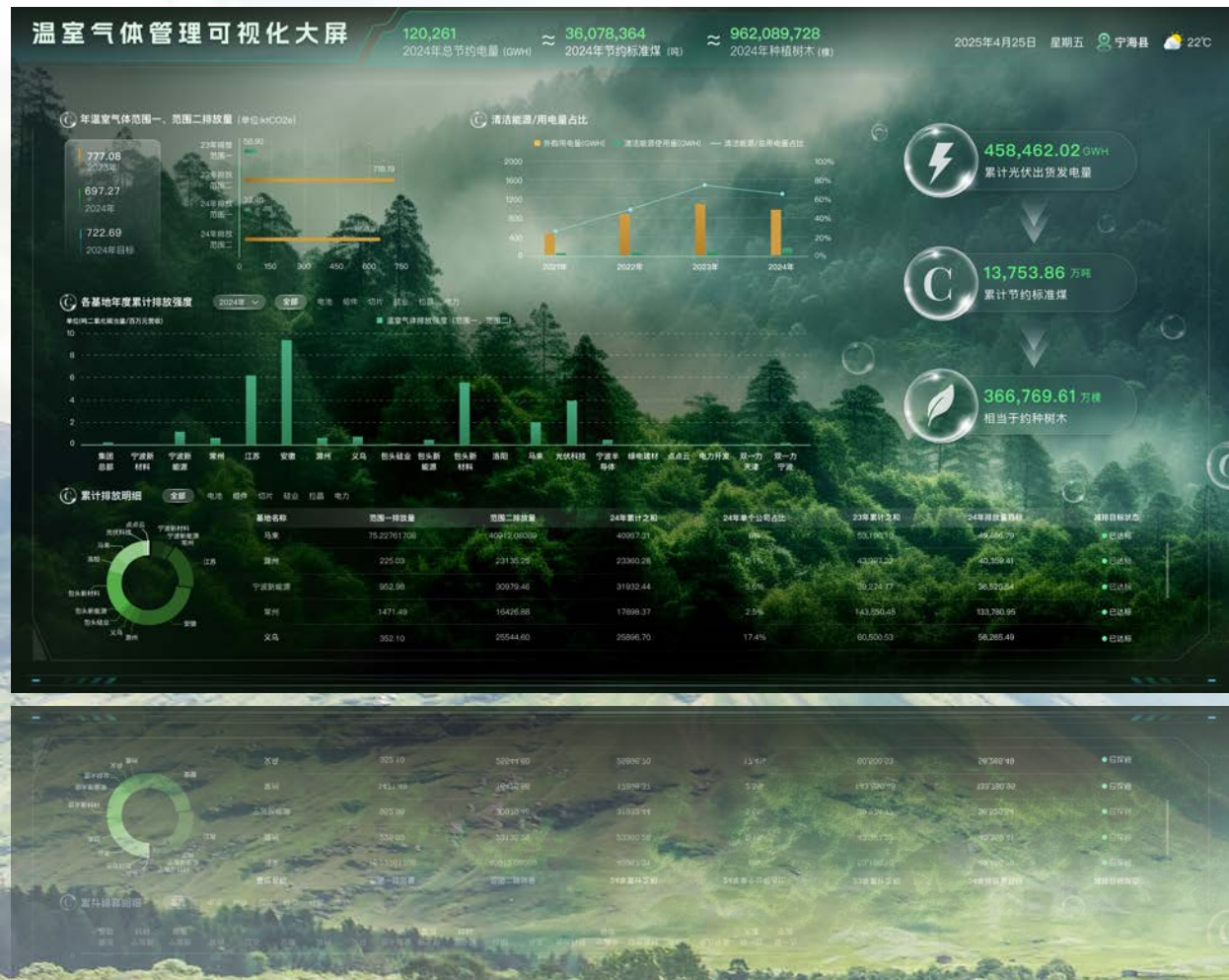
Indicators	Unit	2024	2023	2022
Scope 1 GHG emissions	tCO ₂ e	37,399.11	58,895.04	2,087.22
Scope 2 GHG emissions	tCO ₂ e	659,872.34	718,189.65	49,478.12
Scope 3 GHG emissions	tCO ₂ e	32,701,172.82	18,171,208.75	-

Due to differences in data coverage, the 2022 and 2023 figures are for reference only and should not be directly compared year-on-year

Management Enhancement in Energy Efficiency and Carbon Reduction

We have implemented multifaceted strategies to drive low-carbon transition and mitigate climate-related impacts on both the environment and our operations. To strengthen our institutional framework for energy conservation and emission reduction, we built upon our 2022 Risen Carbon Emission Management Policy by introducing the Risen Electricity Consumption Regulations during the reporting period. These regulations establish clear energy-saving targets for production processes while institutionalizing requirements for energy supply security and power demand-supply analysis, thereby promoting more efficient and optimized energy utilization across our operations

To strengthen our energy and emissions governance, we have implemented a digital monitoring platform that enables real-time tracking, recording, and analysis of energy consumption and greenhouse gas (GHG) emissions, facilitating granular management of these critical metrics. During the reporting period, we completed key implementation phases including: standardizing reporting parameters, assigning data entry responsibilities, conducting operational training, and compiling current-year datasets. Through systematic data cleansing, consolidation, and analytics, the platform now provides validated baseline data that delivers actionable insights for management decision-making on climate adaptation strategies



Energy Consumption Optimization

Given that energy consumption constitutes the primary source of our GHG emissions, optimizing energy consumption has become a cornerstone of our climate strategy. We have implemented comprehensive energy-saving measures across all operations, including: intelligent lighting control in workshops, optimized temperature settings for HVAC systems, and calibrated equipment operating frequencies, all aimed at reducing both energy intensity and associated emissions.

Project name	Description	Outcomes
Process exhaust reduction at Nanbin Base	We conducted airflow balancing to reduce fan operating frequencies and optimize exhaust volumes by aligning actual equipment airflow rates with anemometer (UM) readings. Additionally, we changed the exhaust system from "1 active + 2 standby" to "2 active + 1 standby" configuration. Adjustments were also made in the acid texturing exhaust system: from one unit at 42.5 Hz to two units at 32 Hz; alkaline texturing exhaust system: from one unit at 45 Hz to two units at 34.2 Hz; organic exhaust system: from one unit at 42.2 Hz to two units at 31.6 Hz.	10% reduction in average daily electricity consumption; annual savings: RMB 290,000
Lighting system efficiency enhancement at churhou Base	We adjusted lighting brightness in outdoor areas and auxiliary power rooms, resulting in the shutdown of 18,491 lights to avoid excess brightness.	Phase I annual savings: RMB 715,500 Phase II annual savings: RMB 1,004,400
Energy-efficient pump retrofit at Changzhou Base	We upgraded 3 cooling water pumps and 3 chilled water pumps from Grade 3 to Grade 2 efficiency.	Annual electricity savings: 1,569 MWh; annual cost savings: RMB 1,114,700

Key Energy-saving Measures for PV Business

Project name	Description	Outcomes
Cooling tower maintenance	Periodic replacement of cooling tower packing to ensure optimal heat transfer efficiency and prevent performance degradation due to aging/contamination; monthly cleaning of cooling tower to remove scale and contaminants, maintaining peak cooling system performance.	Achieved monthly savings of 3,000 kWh post-packing replacement
Air compressor optimization	Dynamic adjustment of post-treatment units as needed to regulate pressure levels at equipment room exits; real-time monitoring and calibration of pressure at all terminal points at all the workshops; weekly leak detection audits across the entire compressed air network (including compressed air equipment at all the workshops) every Friday.	Achieved 5-8% energy reduction through progressive pressure optimization

Key Energy-Saving Measures for Energy Storage Business

Risen's actively promotes low-carbon transition through energy efficiency improvements, energy use optimization, and product design innovation, aiming to reduce the impacts of climate risks on the environment and business operations. These efforts have strengthened our sustainability performance and contributed to global climate actions, demonstrating our commitment, leadership, and influence in climate governance.



Appendix: GHG Accounting Methodology

Reporting Boundary:

This GHG emissions accounting covers Risen Energy Co., Ltd. and its 20 subsidiaries under its operational control. The organizational boundary is defined by the operational control approach, which includes all facilities operated under the company's control within the legal jurisdiction of the registered entities.

GHG Accounting Standards and Methodologies:

The accounting methodology follows the principles and requirements of:

- ISO 14064-1:2018 Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.
- ISO 14064-2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.
- Guidelines for the Verification of Corporate GHG Emission Reports (Trial)
- Administrative Measures for Enterprise Environmental Information Disclosure (China)

Emission factors and parameters such as lower heating value (LHV), carbon content per unit of energy, and oxidation rates are based on the industry-specific Guidelines for GHG Accounting and Reporting. Grid emission factors are based on local electricity grid emission coefficients.

Indirect GHG emissions from transportation are calculated using the emission factor method, where activity data are represented by transportation turnover, and emission factors are sourced from the Chinese Product Life Cycle GHG Emission Factors Database.

Product-use-related GHG emissions are calculated based on the purchase of goods and services during production operations. Emission factors are sourced from:

- Beijing Industrial Carbon Emission Intensity Benchmarking Database
- UK EEIO DEFRA Table 13 – Indirect emissions from the supply chain
- UK EPA Supply Chain Greenhouse Gas Emission Factors v1.2

GHG Accounting Scope:

This GHG inventory covers Scope 1, Scope 2, and Scope 3 emissions within the defined organizational and reporting boundaries. All production sites and facilities under operational control are included, with emissions categorized as follows:

- Direct Production Systems: Emissions from welding, laminating, encapsulation, framing, curing, and packaging processes.
- Auxiliary Systems: Supporting systems such as ventilation, internal transportation, drainage, as well as energy supply (power, water, heating, cooling), equipment maintenance, laboratories, instrumentation, and warehouses.
- Supplementary Systems: Administrative and operational support units within the plant area, including production management departments, staff canteens, and dormitories.

Scope	Emission Type	Emission Source
Scope 1 (direct) GHG emissions	Stationary Combustion Sources	Fuel combustion in boilers, internal combustion engines, and diesel generators
	Mobile Combustion Sources	Vehicle use of gasoline and diesel
	Fugitive Emission	Refrigerant leakage (air conditioning), CO ₂ leakage from fire extinguishers, and methane release from septic tanks
Scope 2 (indirect) GHG emissions	Purchased Electricity	Electricity consumption by production, auxiliary, and domestic equipment
	Purchased Thermal Energy (e.g., hot water, steam)	Energy consumption by production, auxiliary, and domestic equipment
Scope 3 (other indirect) GHG emissions	Indirect Emissions from Transportation	· Upstream and downstream transportation and distribution of goods · Employee commuting and business travel
	Indirect Emissions from the Use of Purchased Goods and Services	Purchase of goods and services, and from waste disposal
	Downstream Indirect Emissions Related to the Use of Sold Products	Product use and end-of-life treatment

GHG Accounting Scope