



ENVIRONMENTAL, SOCIAL AND GOVERNANCE REPORT

2023

Golden Concord Holdings Limited

2023 Environmental, Social and Governance Report



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MESSAGE FROM THE PRESIDENT

The year 2023 brought both opportunities and challenges for the new energy industry. As the global energy transition accelerates and the issue of climate change becomes increasingly pressing, the new energy sector, represented by photovoltaics and wind power, has experienced rapid growth, with both installed capacity and power generation achieving significant increases. Emerging fields like energy storage are also developing swiftly. However, the industry is facing intensified competition due to overcapacity and technological bottlenecks, along with the impact of international trade barriers and geopolitical factors on product exports. The Chinese photovoltaic industry is now encountering unprecedented challenges. GCL has been deeply involved in energy sector for 34 years, navigating through the cyclical volatility of the industry's "four rises and three falls." In the face of current uncertainties, we have our own "solutions."



Zhu Yufeng

Secretary of the Party Committee, President and Chairman of the ESG Committee of GCL Group

Build a "Moat" for Development with Technological Innovation:

GCL regards technological innovation as the primary driver of corporate development, focusing on research, development and innovation in core materials such as silicon, lithium, carbon, and integrated circuit materials. We have developed over ten "black technologies", including FBR granular silicon and CCz technology, five of which are "global exclusives". Meanwhile, we are leading the world in the new generation of photovoltaic technology—perovskite photovoltaic modules. In 2023, we continued to break world records for "efficiency and size", and commenced construction of the world's first large-scale perovskite GW-level project, laying a solid foundation for the commercialization of perovskite modules. By the end of 2023, GCL had filed over 5,000 patent applications, with more than 3,000 effective patents. This is the foundation of GCL's confidence.

Cultivate New Growth Drivers by Pursuing "Green" Innovation:

Zhu Gongshan, GCL Chairman, once pointed out: "The first half of the energy transition involves the electrification of the energy system, while the second half focuses on the synchronized resonance of decarbonization, digitalization, intelligence, and decentralization within the power system." GCL, with ultra-low carbon footprint FBR granular silicon at our core, and the industry's first blockchain-based GCL carbon chain, is powering the low-carbon transformation of the photovoltaic industry. We are actively constructing an integrated green energy ecosystem of "electricity + energy storage + computing power." During the reporting period, GCL AI Computing (Suzhou) Center and GCL AI Computing (Shanghai) Center were successively put into operation, with their computing power scale leading the industry. We are using the advantage of "photovoltaic-storage-charge-computing" integrated service to support the low-carbon transition of industries such as construction, industry, and transportation. Our green commuting service brand, "GCL Charge", has scaled up rapidly, providing an ultimate charging experience featured by "one second per kilometer" to support the development of new energy vehicles, with applications in diverse scenarios.

Shape a "New Ecosystem" for Development through Synergetic Innovation:

GCL has been actively embracing the role as a "chain leader." By establishing advanced manufacturing bases for polysilicon production, photovoltaic module manufacturing, and lithium battery production, GCL has played a pivotal role in accelerating the growth of upstream and downstream enterprises across the entire industrial and supply chains. As of the end of 2023, GCL Group had 2,876 qualified suppliers. We promote the integration of new energy with various industries through cross-industry thinking. During the reporting period, we focused on the development of computing power and strengthened close communication and cooperation with enterprises, academic institutions, and governments in Suzhou, Shanghai, and other to build a new world of green, diversified, intelligent and shared clean energy, as well as to inject new vitality into economic development. 'Crisis' and 'Opportunities' will always exist side by side, and we believe that a more collaborative supply chain is the only way for the industry to continue to lead the world.

Amid the ongoing reshaping of the industrial chain, GCL remains steadfast in its commitment to long-termism, recognizing ESG principles as a crucial foundation for sustainable and far-reaching development. We drive the deep integration of ESG considerations into corporate operations. This includes advancing carbon footprint assessments across the entire Group, prioritizing suppliers with carbon footprint certifications, and spearheading a supply chain low-carbon transformation initiative at COP28. We incorporate the demands of stakeholders, into our development planning to build a community of shared value and achieve sustainability.

As the global energy transition progresses, the industry still holds immense potential for growth. At GCL, we are equipped with a "moat" built with technological innovation, the resilience honed from navigating market cycles, and the courage and capacity head for ongoing innovation and transformation. We actively adapt to changes, seize development opportunities, and continuously enhance technological expertise of GCL.

About GCL

Profile of the Group

Founded in 1990, Golden Concord Holdings Co., Ltd. (hereinafter referred to as "GCL Group" or "We") is a green and low-carbon technology company that focuses on diversified new energy, clean energy and renewable energy, including wind, solar, energy storage, hydrogen, ammonia, and methanol. Guided by the goals of "carbon peak and carbon neutrality," we have adhered to the leadership of science and technology (S&T) and digital empowerment over the past 34 years. Our efforts in energy S&T innovation revolve around R&D in silicon materials, lithium materials, carbon materials, and core materials of integrated circuits, driving a revolution in both manufacturing and application through material innovation. Against the background of accelerating the construction of a new power system, GCL Group empowers the digital and intelligent development of energy through the synergy of fixed energy + mobile energy, and the integration of power + energy storage + computing power. We achieve multi-format coupling of source-grid-load-storage, charging, swapping, sales, computing, monitoring and cloud platform. We provide zero-carbon scenario application solutions and comprehensive energy S&T services to the global market, promoting the construction of a new energy system.

By the end of 2023, GCL Group's assets exceeded RMB 200 billion, with an annual operating income of nearly RMB 200 billion. Our business spans over 100 countries across 6 continents, and we have several listed companies, including GCL Tech (03800.HK), GCL SI (002506.SZ), GCL New Energy (00451.HK) and GCL ET (002015.SZ). We are proud to employ over 3,000 energy S&T professionals.

Industry Influence

Executive Council Member of the China Chamber of International Commerce

Chairman of Asian Photovoltaic Industry Association

Chairman of Global Green Energy Council

Co-chairman of the Global Solar Council

Vice Chairman of China Electricity Council



Industrial Layout



Organization

- Management Centers
- R&D Centers
- Sales Centers
- Representative Offices
- Branches

Base

- Silicon Material Base
- Semiconductor Base
- Perovskite Base
- Innovative Materials Base
- Battery Base
- Module Base

- Intelligent Computing Center
- Energy Storage Base
- Charging Station
- Power Station
- Natural Gas Base
- Clean Energy Power Station
- PV Operation and Maintenance Base

Others

- Docks/Terminals
- Ports

Legend

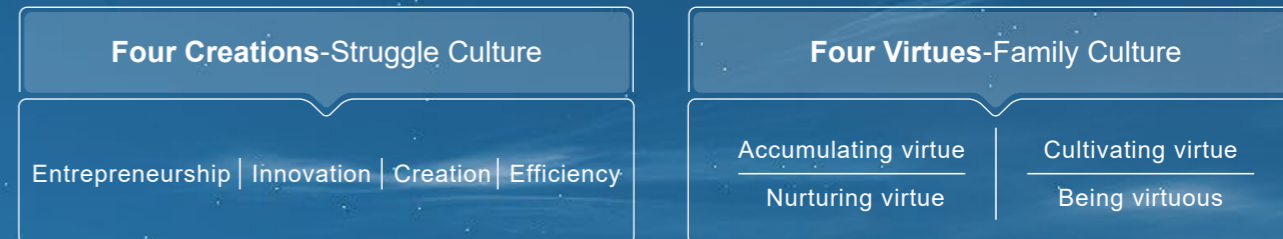
- Continental border
- Undetermined
- National boundary

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Map approval number : GS(2020)4392
Produced under the supervision of the Ministry of Natural Resources of the PRC

Culture of the Group

"Water has a source, so it flows endlessly; trees have roots, so they grow unceasingly." In the process of continuous development, GCL Group emphasizes the accumulation, extension and condensation of its culture. In 2023, the "Wutongqiao Spirit", "GCL Craftsman Declaration" and "GCL Basic Law" oaths were successively released to constantly enrich the corporate spiritual pedigree. At the same time, the "Four Creations" (entrepreneurship, innovation, creation, and efficiency) extended the core of the "struggle culture" and the "Four Virtues" (accumulating virtue, cultivating virtue, nurturing virtue, and being virtuous) enriched the connotation of "family culture". We aim to interweave the profound moral heritage of GCL Group with humanistic values to shape the cultural charm and corporate character of GCL.



Culture Matrix of GCL Group



Brand Value



Driven by cutting-edge strategic concepts, a broad international vision, a unique forward-looking perspective, and a commitment to green energy, an ecological brand group centered around GCL has emerged. By making technology our core and quality our soul, we continue to deepen the connotation of brand value and contribute the "GCL" strength to global sustainability.

In 2023, the Brand Value of GCL Group

Among in the Global Top 500 New Energy Enterprises No. 2	Among the Top 500 Asian Brands No. 160	Among China's Top 500 Energy Enterprises No. 38
Among China's Top 500 Enterprises No. 149	Among China's Top 500 Private Enterprises No. 40	



Brand value elevated by **50%**  Ranking rose by **17** places

*2023 Brand Value

ESG Governance

ESG Philosophy

We are committed to restoring the original principles of ESG and truly applying it to help achieve sustainability for enterprises. For businesses, deepening their core operations, ensuring sustainable practices, and pursuing high-quality development remain their most important social responsibilities. In this process, we organically integrate the concerns and demands of stakeholders into our development strategy. By leveraging our positive influence, we inspire, empower, and achieve mutual success with our stakeholders. The energy industry is our primary focus, and we are dedicated to building a better energy future through technological innovation, sustainability, and digitalization. We aim to leverage our influence to support the success of our stakeholders, thereby achieving a true synergy of social, environmental, and economic benefits.

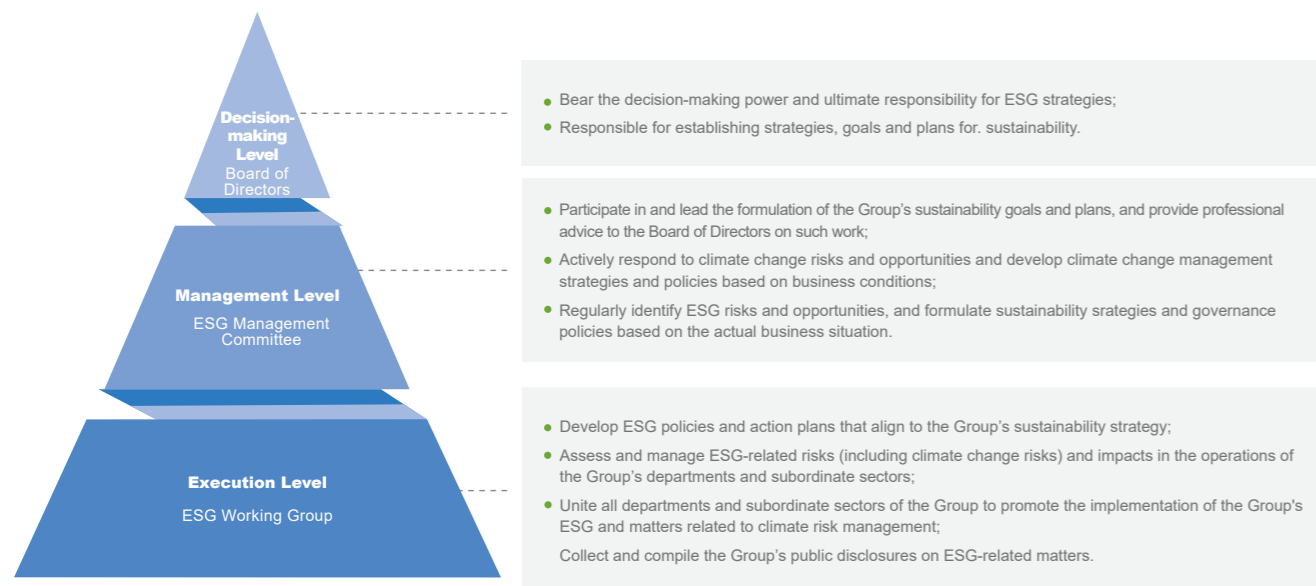
ESG Governance

GCL Group continues to improve its internal ESG governance structure to ensure the standardization and effectiveness of the governance process; by promoting ESG governance practices, we fortify the Group's brand image, strengthen ties with various stakeholders, and help create a sustainable ecosystem of co-governance and sharing.

ESG Governance Structure

GCL Group has established a three-level ESG governance structure of "decision-making level – management level – execution level" to constantly improve the effectiveness of the Group's ESG governance.

ESG Governance Structure



Stakeholder Communication

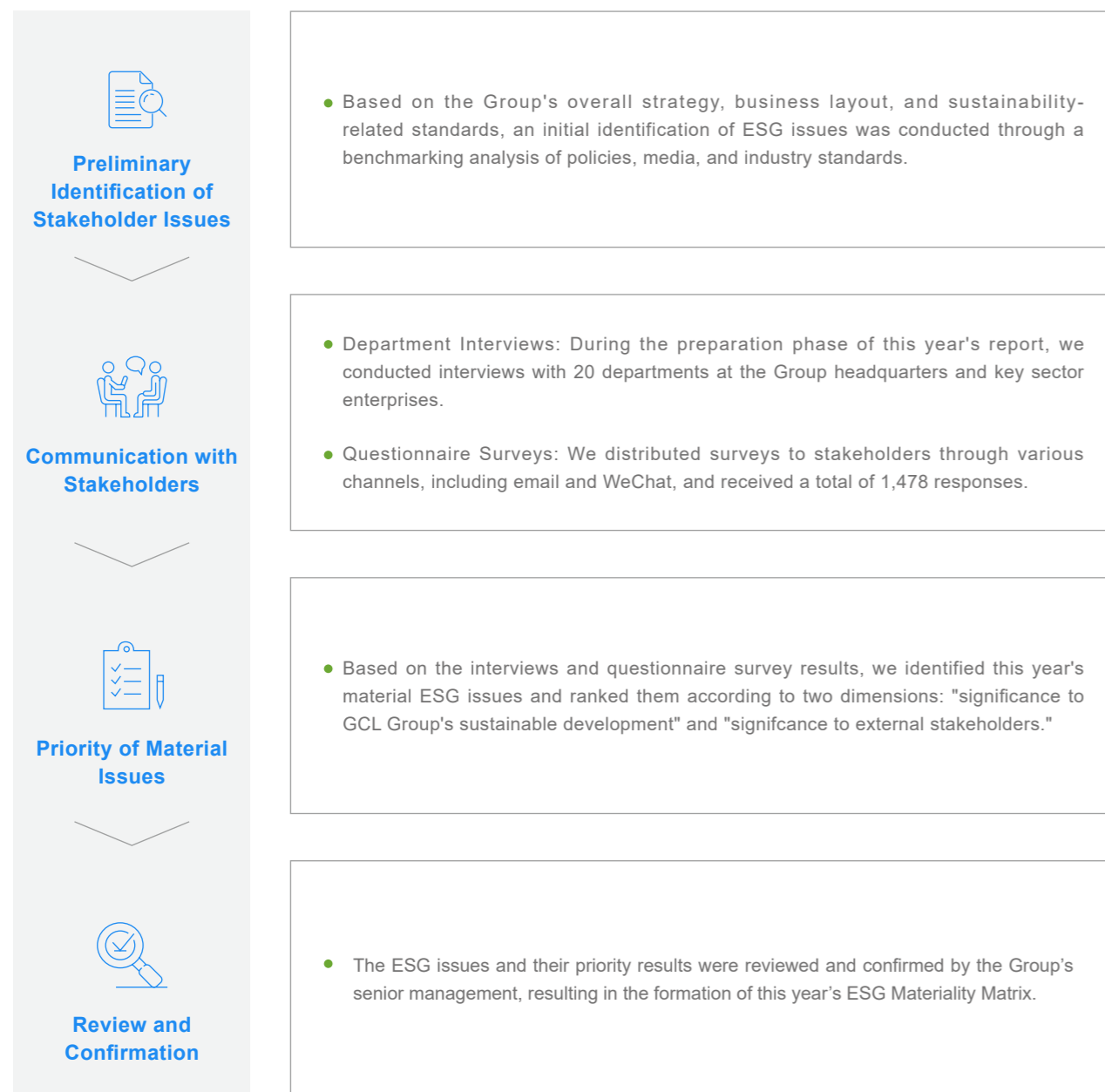
In order to gain a deeper understanding of the expectations of GCL Group's major stakeholders, we continuously improve our diversified communication mechanisms, build a two-way, efficient communication bridge, listen to and respect the voices of stakeholders, and respond and provide feedback to their expectations in a timely manner. We are committed to creating a sustainable ecosystem of mutual benefit and symbiosis.

Main Stakeholders	Main Issues of Concern for Stakeholders	Communication Channels
 Government and Regulatory Agencies	Pay taxes according to law Compliant operation Environmental compliance Driving regional industrial development Job creation	Supervision and check work report policy suggestion
 Shareholders and Investors	Corporate governance Investor relations management Climate risk management R&D innovation IP management	Investor meeting On-site research activities
 Employees	Equal employment Compensation and benefits Employee rights and interests Employee care Employee development and training Occupational health and safety	Conference for employee representatives Interviews with new employees Staff seminar Online mailbox Employee satisfaction survey
 Supplier	Supply chain management Business ethics Responsible procurement Mutual benefit and win-win	Supplier communication Supplier evaluation and assessment Sunshine procurement
 Partner	Driving industry development R&D innovation IP management Business ethics	Strategic cooperation Site survey Industry exchange
 Clients and Consumers	Product quality and safety Customer service R&D innovation Responsible marketing Information security	Site survey Satisfaction survey Customer complaint management Questionnaire survey
 Community and the Public	Community Contribution and engagement Environment friendly Biodiversity	Participation in community activities Charitable projects Volunteer service
 Media	Environmental protection Rights protection Information transparency	News report Management interview Site survey Industry exhibitions

Identification of Material Issues

We prioritize the expectations of all stakeholders. By aligning with our development strategy and staying abreast of international industry trends, we identify and select and identify ESG issues pertinent to GCL Group. Through departmental interviews and stakeholder questionnaire surveys through questionnaires, we engage with stakeholders both within and outside the Group. Based on the results of these surveys and communications, we rank the key issues, create a matrix of material issues for the year, and address them in our report.

Steps to Identify Material Issues



GCL 2023 Matrix of Material ESG Issues



Environmental Issues (E)	Social Issues (S)	Corporate Governance Issues (G)
1 Environmental management system	8 Protecting employees' rights and interests	15 Product and service quality
2 Energy management	9 Employee welfare and care	16 Customer service management
3 Water management	10 Employee training and development	17 Digitalization
4 Emissions and waste management	11 Diversity, equality and inclusion	18 Industry cooperation and development
5 Addressing climate change	12 Occupational health and safety	19 Supply chain management
6 Developing clean energy	13 Network security and information security	20 Sustainable supply chain management
7 Ecological harmony	14 Technological innovation and R&D	21 Social impact and contribution
		22 Corporate governance
		23 Business ethics and anti-corruption
		24 Risk management and internal control
		25 Intellectual Property protection
		26 ESG management

ESG Communication and Exchanges

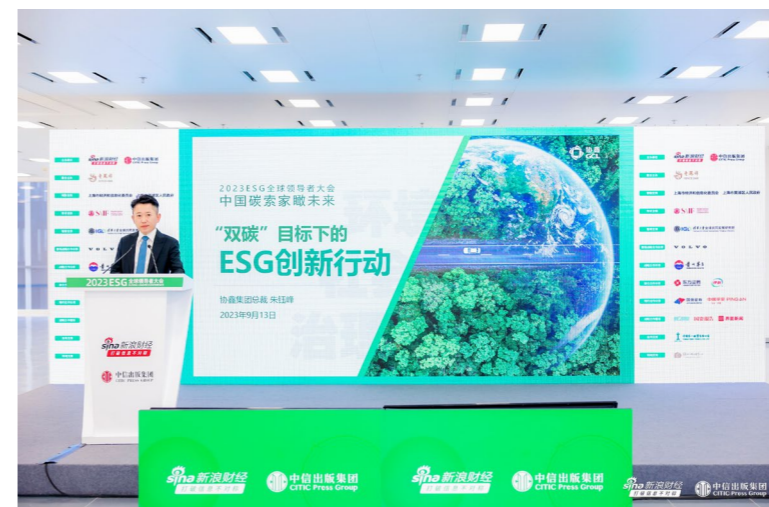
We actively participate in ESG communications and exchanges, vigorously promote ESG concepts and green development concepts, and are committed to building a sustainable future alongside our industry peers.

28th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28)



As a member of the "COP28 China [Carbon Pathfinder] Corporate Delegation", GCL Group discussed with experts and scholars from around the world the direction of the green technology revolution and energy industry transformation in the world today, and demonstrated GCL's leadership in the field of renewable energy and its commitment to environmental protection. GCL Group was awarded the honour of China's [Carbon Pathfinder] Pioneer Enterprise in Response to Climate Change at COP28.

ESG Global Leaders Conference



As one of the keynote speeches of this conference, "China Carbon Explorers' View of the Future" invited representatives of well-known domestic new energy enterprises and investment companies to discuss the "dual carbon" issue under sustainability. Zhu Yufeng, President of GCL Group, was invited to attend and delivered a speech entitled "ESG Innovation Action under the 'Dual Carbon' Goal", sharing his insights and strategies on sustainability.

CREC 2023 Carbon Neutrality Forum



Sun Wei, Vice Chairman and Executive President of GCL Group, participated in the 2023 Carbon Neutrality Action - 50-person Forum and discussed in depth key issues, such as the health of the new energy industry, innovation in carbon neutrality paths, ESG governance and the development of Wuxi's new energy industry.

ESG Performance and Awards

Environment Category

Thoroughly Develop the Green and Low-carbon Industries

Photovoltaic Industry

In 2023, the production of polysilicon is

232,256 tons

The annual production of Wafer is

51,077 MW

In 2023, the module shipments is

16.42 GW

If all of this were used for the construction and operation of photovoltaic power plants, it could generate enough green energy to support the living electricity consumption of 84 million people (approximately the population of Jiangsu Province).

84.32 billion kWh

Cumulative service capacity for new energy power stations

10 million kWh

The number of products certified for their carbon footprint

15

Clean Energy and Integrated Energy Services

Clean energy installations accounting for

80%

The annual grid electricity in 2023 approximately equals to the total electricity consumption of Suzhou Industrial Park over two years.

9.46 billion kWh

The electricity sales for market-based transaction service in 2023

24.784 billion kWh

Digital Energy

GCL AI Computing (Suzhou) Center—the first AI computing center in China applied to the energy sector

The first in China

GCL AI Computing (Shanghai) Center—as Shanghai's first AI computing system, a high-performance computing system, composed of one thousand or more computational acceleration cards, focusing on vertical fields

The first in Shanghai

Practicing Green and Low-carbon Development

Investment in environmental protection in 2023

729,320,200 yuan

Revenue grew by 16.95%, while energy consumption decreased

5.67%

Use of renewable energy

67,507.59 MWh

The amount of recycled water

35,317,113.11 tons

The proportion of recycled water is

65.95%

Provincial-level or higher green factories, including 4 national-level green factories

8

Production sites completing GHG inventories

10

ESG Performance and Awards

Social Category

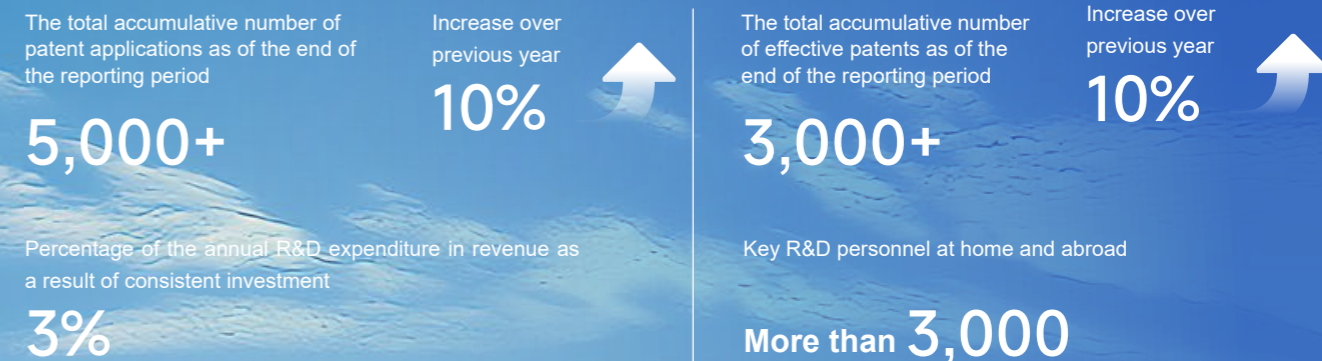
Employee



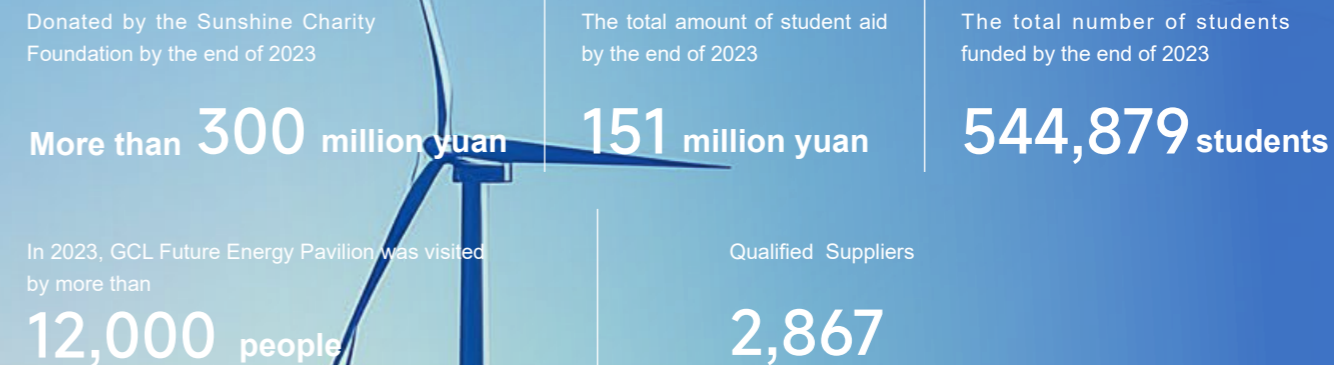
Safety Production



Technology Innovation



Public Welfare and Charity



Corporate Honors

GCL ET

- The Most Socially Responsible (ESG) Listed Company of the Year
China Securities Market Research and Design Center Capital Week
- Dual Carbon Innovation Pioneers
Southcn.com
- Top 10 Green Energy Brands of the Year
GreenergyDaily.com

- 2023 Leading Brands with Green Influence in Carbon Neutrality
China Energy News China Institute of Energy economics research
- Chinese Model Enterprise for Modernization Practice and Development
The Economic Observer

GCL New Energy

- MW Jade Award
2023 SNEC Expo
- "Milestone Witness" for New Energy Power Station Operation and Maintenance
Photovoltaic systems

- PVBL Photovoltaic Industry Excellence Service Award
Century New Energy Network
- Dual Carbon Technology Innovation Typical Case
China Energy News

GCL Tech

- 2023 Beautiful China Dual Carbon Pioneer Award – Golden Jubilee Award
China Investment Network
- Sustainable Brand Models
Huxiu "Clean Opportunity Leaderboard"

- Best Environmental (E) Practice Enterprise of the Year
Finance.china.com.cn The Third ESG Practice Research on Chinese Enterprises (2023)
- 2023 Most Influential PV Raw Material Manufacturers
Solarbe

GCL SI

- 2023 Listed Companies ESG Pioneer Case
Securities Daily
- Most Socially Responsible (ESG) Listed Company
Weekly on Stocks The 17th (2023) Crystal Ball Awards

- 2023 Outstanding ESG Practice Cases Dual-carbon Pioneer of the Year
NetEase Economic
- Taihu Lake Green Excellence Award Gold Award
Committee of the Chinese Renewable Energy Conference & Exhibition

New Energy

GCL Group stands at the forefront of the new energy sector, leading the green revolution with outstanding technological innovation and building a low-carbon, highly efficient industrial chain ecosystem. We have set an example for the global green energy transition. Our relentless pursuit of environmental protection and sustainable development has not only profoundly transformed the industry but also painted a grand vision of a cleaner, greener future for the planet.



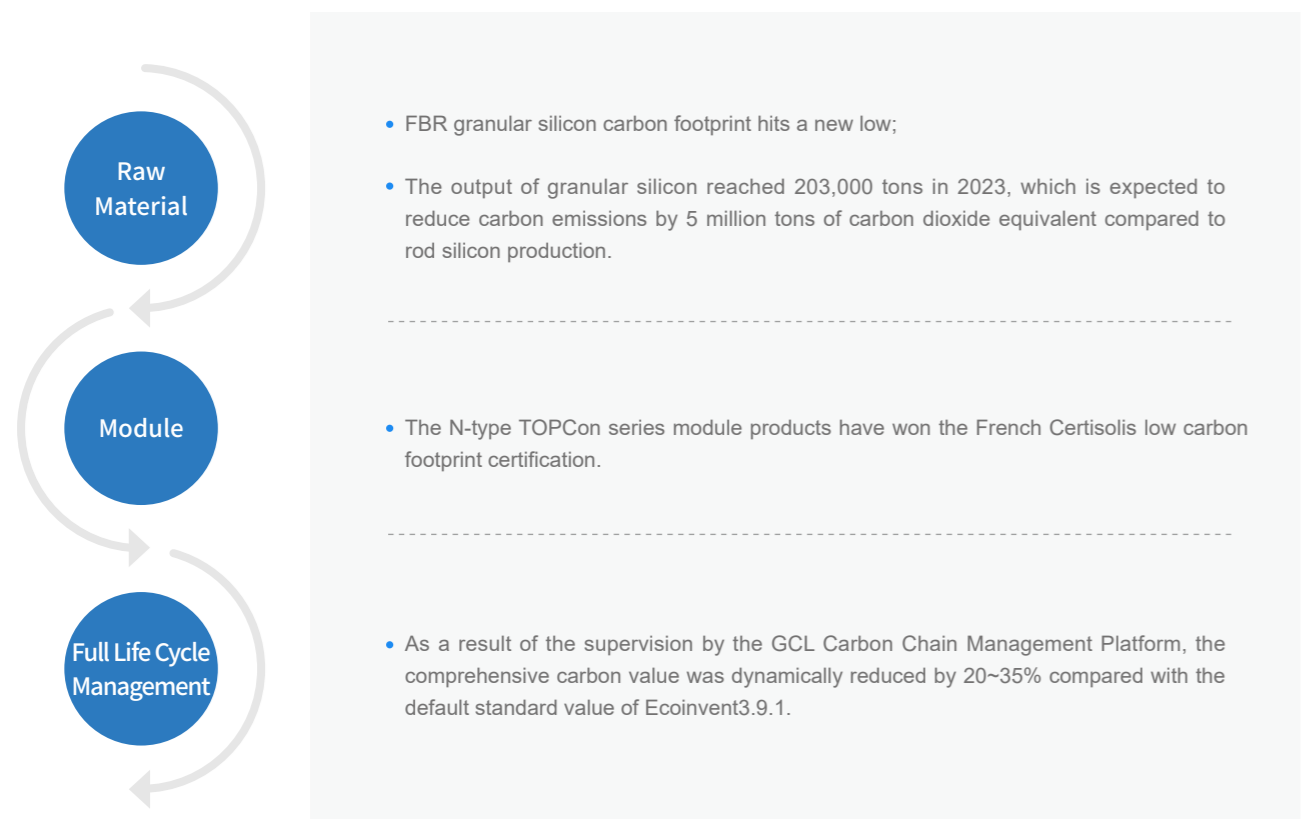
Thoroughly Develop the Green and Low-carbon Industries

GCL has always been dedicated to promoting a zero-carbon economic model and advancing the economic and social transition towards sustainability. GCL actively leveraged our "chain leader" advantage, beginning with innovations in upstream energy and advanced material technologies. This leadership extended to revolutionizing industrial manufacturing, system integration, and equipment customization in the midstream and downstream sectors. By doing so, GCL has established a new model for a zero-carbon industry that integrates green electricity with green industry practices.

Photovoltaic Industry: Drive Low-Carbon Transformation in the Industry

GCL Group entered the photovoltaic industry in 2006 with silicon material manufacturing. Through its original GCL modified Siemens method, it successfully broke the foreign technology monopoly and quickly grew into a world-class polysilicon leader. GCL has built a global silicon energy industry chain and created **an industry-leading intelligent production base for silicon powder, FBR granular silicon, silicon wafers, batteries, and modules**, providing global customers with high-efficiency photovoltaic module products, "photovoltaic +" and intelligent operation and maintenance services.

With the growing global focus on reducing carbon emissions, photovoltaics has become a crucial tool for carbon reduction while also facing significant pressure to minimize its own carbon footprint. GCL addresses this challenge by utilizing ultra-low carbon footprint FBR granular silicon as a core component, leveraging the benefits of digital innovation to support the low-carbon transformation of the entire photovoltaic industry chain. As of the end of 2023, a total of 15 products received product carbon footprint certification.



Raw Material Side - FBR Granular Silicon with Ultra-low Carbon Footprint

According to European Commission's calculation method for product environmental footprint, the carbon footprint of the upstream photovoltaic manufacturing link accounts for 80% to 95% of the entire life cycle of photovoltaic products, and the emission contributed by high-purity polysilicon production is about 47%. Against this background, reduction of carbon emissions at the raw material side of photovoltaic module products is key to the industry's decarbonization.

In 2021, FBR granular silicon was launched in batches and obtained a certificate of carbon footprint certification issued by the French National Energy Agency. The carbon emissions per kilogram of granular silicon was only 37kgCO₂e, breaking the global record of 57.559 kgCO₂e previously set by Wacker in Germany. During the reporting period, GCL adopted the "horse racing model" to motivate all bases to make continuous breakthroughs. Of them, Leshan GCL's granular silicon was awarded the carbon footprint certification by the China Quality Certification Center, with each kilogram of granular silicon emitting only 27.59 kgCO₂e, further reducing the carbon footprint of the product. In 2023, the output of granular silicon was 203,000 tons, which was expected to reduce carbon emissions by 5 million tons of carbon dioxide equivalent compared with rod silicon production⁶.

Nominal production capacity of granular silicon	In 2023, the output of granular silicon was	Which was expected to reduce carbon emissions by
420,000 tons	203,000 tons	5 million tons of carbon dioxide equivalent

⁶The calculation method for carbon dioxide emission reductions: (Electricity consumption per kilogram of rod silicon production - Electricity consumption per kilogram of granular silicon production) * Annual output of granular silicon * National power grid's average emission factor. The average power consumption for rod silicon production is sourced from the 2023-2024 Chinese Photovoltaic Industry Development Roadmap by the China Photovoltaic Industry Association, which is 57 kWh/kg-si. The power consumption for granular silicon production is 13.8 kWh/kg-si. The national power grid's average emission factor is the coefficient recommended by the Notice on the Management of Green house Gas Emission Reporting of the Power Generation Industry for 2023-2025, which is 0.5703 tCO₂/MWh.

Modules - Green Design and Green Manufacturing

In the process of module manufacturing, GCL has strengthened green management of the entire product life cycle, and reduced product resource consumption, thus providing the society with lower-carbon photovoltaic products. During the reporting period, GCL's N-type TOPCon series module products passed the German TÜV Rheinland safety certification and the French ESG carbon footprint authoritative certification.

Green Design	<ul style="list-style-type: none"> Introduce the concept of eco-design in the product design process, carry out eco-design self-assessment in accordance with GB/T 24256 "General Principles of Product Eco-design" and GB/T 32161 "General Principles of Eco-design Product Evaluation", and form an inspection report.
Green Purchasing	<ul style="list-style-type: none"> Give priority to establishing cooperation with products suppliers that have obtained carbon footprint certification or whose products have a lower carbon footprint, and require all buyers to sign a "Safety and Environmental Protection Commitment Letter".
Green Production	<ul style="list-style-type: none"> Attach importance to green lean production, stick to green intelligent manufacturing, vigorously promote the digital and intelligent transformation of factories, and constantly build green factories.
Green Logistics	<ul style="list-style-type: none"> Rationally plan the layout of factory sites, take measures such as combined road and rail transport and optimizing transportation routes, continuously improve the efficiency of resource utilization in logistic links such as containerization, storage and transportation, and accelerate the construction of a digital low-carbon logistics industry chain.
Green Recycling	<ul style="list-style-type: none"> Strictly follow the EU Waste Electrical and Electronic Equipment (WEEE) Directive, properly dispose of scrapped photovoltaic module equipment, and acquire organizational certification; Actively explore ways to recycle and increase the value of "retired" photovoltaic components, and promote the implementation of projects that reuse and recycle waste components.



Product Certification Report

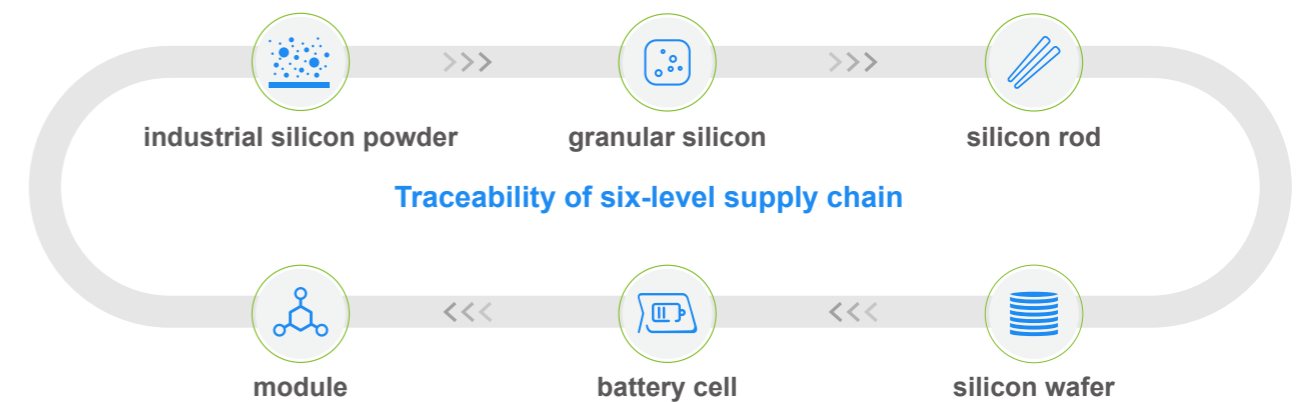


Low-carbon Certification Report

Strengthen Carbon Footprint Management - "GCL Carbon Chain"

In 2023, GCL launched "GCL Carbon Chain" - the world's first full-link zero-carbon digital management platform based on advanced technologies such as blockchain and privacy computing. This solution has been widely used in the entire value chain, effectively improving our product capabilities such as accurate measurement and analysis of product carbon footprints, making carbon data traceable, examinable and credible, and promoting the green and low-carbon development of the industry with digitalization.

"GCL Carbon Chain" applies the traceability form of "one item one code". By scanning the QR code on the component, one can quickly read product information, carbon footprint report, production factory, raw material sources and other information, and achieve real-time, accurate, efficient and deep traceability of the supply chain. It empowers the entire life cycle of products: the traceability and management of "carbon emissions" from the production, transportation, sales and use, enables products' "carbon emission value" to bear clear code identification "from cradle to gate", thereby helping global customers transform their energy by relying on truly green and low-carbon "bright code" products.



FBR's Total Production Capacity for Granular Silicon Reaches 420,000 Tons

In September 2023, the 100,000-ton granular silicon production capacity of Inner Mongolia Xinhuan Silicon Energy Technology Co., Ltd. was officially launched. The total production capacity of GCL's four major granular silicon bases exceeded 420,000 tons.



The Advanced Production Capacity of Large-size Modules and Cells Has Been Fully Released, Making the Shipment Rank Among the Top Ten in the World

Component Segment:

The production capacity of Hefei GCL's 60GW large-size component production base (Phase I) and the Funing base reached 17.5GW and 12GW respectively.

Battery Cell Segment:

The first phase TOPCon battery project (10GW) of Wuhu GCL's 20GW high-efficiency battery realized full production capacity in October 2023, and its product efficiency and yield indicators have reached the industry's leading level.



Wuhu Battery Base

Digital Energy: Synergetic Development of "Electricity + Energy Storage + Computing Power"

"Guided by the goal of 'dual carbon', the construction of a new power system is accelerating its paces. An era of intelligence, digitization, flexibility has arrived which is featured by resonance between digital energy and digital economy. Energy and computing power have become inseparable 'twin stars'."

—Zhu Gongshan

Thanks to its unique advantages in green electricity, AI computing, electricity sales and other fields, GCL is actively building an integrated green energy ecosystem composed of "electricity + storage + computing". Using computing power as the foundation of its digital energy business, GCL organically combines electricity and computing power to create a new productivity model; relying on energy storage as the core, GCL focuses on grid-side, industrial and commercial, and mobile distributed energy storage, while making an overall plan in the field of super charging, so as to provide users with integrated solutions for photovoltaic storage, charging, swapping and sales, and jointly shape a new landscape of digital energy.

AI Computing Center

GCL provides the world's leading computing power and energy, focusing on manufacturing large models and various application scenarios such as smart energy and zero-carbon transportation, and connecting the entire industry chain of "government", "industry", "university", "research" and "application" from end to end. We practice "electricity + computing power = new productivity", realize the deep integration of digital economy and real economy, and build a digital foundation for urban energy. The construction system of the AI Computing Center is diversified and heterogeneous, and AI clusters have been built based on the world's leading basic software and hardware, with a computing power scale leading in China.

AI Computing Centers Put into Operation

GCL AI Computing (Suzhou) Center

The first AI computing center in China applied to the energy sector



GCL AI Computing (Shanghai) Center

As Shanghai's first AI computing system, a high-performance computing system, composed of one thousand or more computational acceleration cards, focusing on vertical fields, the project integrates advanced technologies such as high-performance computing, artificial intelligence, and big data analysis to efficiently serve scientific research, industrial development, and social needs.



Integration of Photovoltaic Generation, Energy Storage, Charging and Computing

GCL uses AI computing as the digital foundation of its energy business, deeply empowers energy storage and energy replenishment businesses with AI computing. The integration of "photovoltaic generation, energy storage, charging and computing" serves as the core strategy for accurate layout in the upstream and downstream of the entire industry chain. During the reporting period, GCL and Huawei Digital Power reached an all-round cooperation on the construction of an integrated liquid-cooled supercharging network for energy storage, charging, photovoltaic generation and cloud platform, bringing users the ultimate charging experience featured by "a cup of coffee, a full charge"; We launched the green travel service brand "GCL Charge" which has been available in diversified application scenarios such as highways, transportation hubs, city centers, and communities.

Integrated Solution for Photovoltaic Generation, Energy Storage, Charging and Computing

Photovoltaics - Providing Green and Low-cost Energy

The 150kW Xinyunding BIPV passed the overall Class A non-combustible test. It has extremely high safety performance. Coupled with efficient mechanical load performance and high waterproof performance, it can continuously provide low-cost green electricity.

Energy Storage - Optimizing the Entire Industry Chain Solution

Based on exploration of market terminals, GCL launched standardized solutions for the entire energy storage industry chain. The intelligent string-type integrated energy storage system adopts the ALL-in-one integrated design concept and fully responds to various functional requirements on the source-grid side and the user side around the clock.

Supercharge - Bringing a Revolutionary Super-speed Charging Experience

supercharging pile has a maximum output power of 600kW at supercharging terminal. Liquid cooling technology ensures an ultra-long life of 20 years, achieving the ultimate charging experience of "one kilometer per second".



"It Is Amazing!" - La Camera, Director General of the International Renewable Energy Agency Praised GCL's Technology

On September 8, 2023, Francesco La Camera, Director-General of the International Renewable Energy Agency, made a special visit to the GCL Suzhou Energy Center. Accompanied by Chairman Zhu Gongshan, he inspected GCL Future Energy Pavilion and the integrated application scenarios of photovoltaic generation, energy storage, charging and computing, and closely experienced the bold breakthroughs and innovations of GCL in the process of energy transformation.



La Camera experiences super charging featured by "one kilometer per second"

Clean Energy: Keep Optimizing Energy Structure

GCL is willing to be the "guardian of blue sky and clear water", and keeps developing clean energy projects, such as gas turbine cogeneration, wind power generation, and waste power generation. We have realized clean energy on the supply side and become one of China's leading non-public operators and service providers for clean energy power generation and combined heat and power. We deployed large-scale wind power and photovoltaic new energy bases and built integrated projects of source-grid-load-storage in Northwest and North China. We constructed gas-fired thermal power, biomass power generation, and pumped storage power stations in industrial parks in East and South China, with clean energy accounting for more than 80%. Among them, GCL ET, a subsidiary of GCL Group, completed the electricity settlement of 9.46 billion kWh and natural gas settlement of 12.8906 million tons throughout the year.

With clean energy power generation and cogeneration as its core, GCL provides customers with comprehensive energy services, including electricity sales, distribution, energy storage, demand-side management, energy efficiency management, microgrids, energy big data, as well as carbon asset management, carbon neutrality certification, green electricity, and green certificate trading, boasting a leading domestic comprehensive service provider of new power system.

By the End of 2023,

GCL's clean energy accounted for more than

80%

GCL ET completed the electricity settlement of

9.46 billion kWh

GCL ET completed the natural gas settlement of

12.8906 million tons



Integrated Energy Services

GCL ET Delivers the First Green Certificate for its Self-owned Wind Power Project

In April 2023, GCL ET delivered the first green electricity certificate of self-owned project. Taicang Brose Drive Systems Co., Ltd. purchased 271,000 kWh of green electricity produced by Jiangsu Funing GCL 30MW wind power project in January 2023. By the end of 2023, GCL ET cumulatively traded green electricity and green certificate over 250 million kWh. As a result of deepening carbon asset innovation business, its carbon finance scale exceeded 25 million yuan.

By the End of 2023,

GCL ET cumulatively traded green electricity and green certificate over

250 million kWh

GCL ET's carbon finance scale exceeded

25 million yuan



The 30MW Wind Power Project of Jiangsu Funing GCL

Natural Gas Industry

GCL Huidong LNG Terminal Project in Jiangsu Rudong Is Progressing Efficiently

In December 2023, the air-jack dome lifting operation of the No. 1 - 200,000 cubic meter LNG storage tank of the GCL Huidong LNG Terminal Project in Jiangsu Rudong was successfully completed. This project is a key project in national "14th Five-Year Plan", and a significant achievement of GCL Group in helping the "Belt and Road" initiative to implement the energy cooperation and gas-electricity integration strategy.

LNG storage tank air-jack dome lifting operation completed with a capacity of

200,000 cubic meters





Application of Zero Carbon Solution

Relying on the integrated layout in the photovoltaic industry chain and the advantageous synergy with industries such as energy storage and integrated energy utilization, we provide zero-carbon solutions for different users and various application scenarios such as "integration of photovoltaic power and energy storage" and "integration of photovoltaic power, energy storage and charging", and serve the energy transformation of various industries.

Industry and Commerce

- We leverage the synergistic advantages of multiple fields, such as the integrated photovoltaic industry chain, energy storage, and comprehensive energy services, to help multiple industries promote green and low-carbon transformation.

Architecture

- Industrial Parks / Commercial Buildings: We are the first to explore and practice integrated energy services based on micro-grids in China, providing various types of carbon-neutral scenario applications such as zero-carbon industrial parks, factories, and buildings.

Transportation

- By adopting the integrated solution of "Photovoltaic Power-Storage-Charging", we deepen the integration of photovoltaic power generation, energy storage technology and electric vehicle charging facilities to create a highly intelligent, flexible and convenient integrated solution of photovoltaic storage and charging, and promote the development of green mobility.

Electricity

- Providing photovoltaic modules and other products for photovoltaic power stations and other users;
- Providing energy storage products for power stations, etc.; improving the utilization rate of green energy to help build a new energy system.

Rural Area

- "GCL Sunshine" comprehensive solar energy system provides solutions for six application scenarios for different regions and housing types.

Industry and Commerce: Integrated Project of "Photovoltaic Power, Energy Storage and Charging + Thermal Energy, Electricity and Cooling Energy" Helps Factories Increase the Proportion of Green Electricity Consumption.

In December 2023, the first integrated project of "photovoltaic power, energy storage and charging + thermal energy, electricity and cooling energy" of GCL ET in the southern region - the 2.5MW/4.48MWh energy storage power station of Guangdong Yantang Dairy Co., Ltd., was officially connected to the grid and put into operation. This project has an annual discharge capacity of 2.63 million kWh, achieving 100% consumption of new energy, increasing the proportion of green electricity consumption, and reducing carbon dioxide emissions by 21,000 tons during the operation period. This project won the "2023 Distributed Energy Excellent Project First Prize" co-awarded by the International Forum on Distributed Energy and China Energy Network.



Guangdong Yantang Dairy: Integrated project of "Photovoltaic Power, Energy Storage and Charging + Thermal Energy, Electricity and Cooling Energy"

Transportation: Invest to Build Demonstration Projects that Integrate Photovoltaic Power, Energy Storage and Charging to Empower Green Mobility

In October 2023, the first integrated photovoltaic power, energy storage and super charging station on Jiangsu Expressway was officially put into use. The project is equipped with 550W BIPV photovoltaic modules, which combined with 3.72MWh block-type energy storage equipment to generate 53,000 kWh of electricity annually. It can reduce carbon dioxide emissions by about 30.3 tons and facilitate the environmentally friendly journeys of 200,000 new energy vehicles.

53,000 kWh of Electricity Generation Annually

Potentially reducing carbon dioxide emissions by approximately

30.3 tons

Supporting green mobility with new energy vehicles, totaling

200,000



Jiangsu Expressway's first integrated photovoltaic power, energy storage and super charging station

Architecture: Construct Suzhou's First Carbon-Neutral Level-3 Hospital to Explore Zero-Carbon Development of Large Public Buildings

In July 2023, the zero-carbon project of Changshu Second People's Hospital, jointly built by Suzhou Wudu Energy and GCL ET, was awarded the "Carbon Neutrality Certificate". The project can achieve more than 5% energy saving and consumption reduction annually by applying the energy management digital platform. GCL ET further provides a carbon-neutral comprehensive energy solution covering heat, electricity and cooling by taking multiple measures to reduce energy costs and tapping the potential of technology transformation for carbon reduction and consumption reduction, thus achieving 10,497 tons of carbon emissions offset.

Tapping the potential of technology transformation for carbon reduction and consumption reduction, thus achieving carbon emissions offset

10,497 tons



Carbon-Neutral Project of Changshu Second People's Hospital

Electricity: Xipo Photovoltaic+Energy Storage Power Generation Project in Jinchuan District, Jinchang City, Gansu Province

The project uses the 80MWh Shield-30CB series energy storage system independently developed by GCL SI, paired with the 200MW high-efficiency photovoltaic modules, to help the power station realize peak load and frequency regulation.



Accelerate the Process of Internationalization



Energy has no borders. Relying on its brand influence and resource integration capability, GCL actively explore the global market to bring green and clean energy to the whole world. As of the end of the reporting period, GCL's photovoltaic products and solutions have covered more than 50 countries and regions around the world. In August 2023, GCL SI signed a cooperation agreement with Indian leading photovoltaic project developer SAEL Industrial Co., Ltd., for 1.1 GW N-type high-efficiency modules, becoming one of the largest procurement projects in the Indian market in recent years. It develops or operates energy projects in Indonesia, Serbia, and East Jakarta, Indonesia to provide green energy and solutions to global customers.



GCL's green solutions have been showcased multiple times at international exhibitions.

During the reporting period, GCL's FBR granular silicon, N-type high-efficiency photovoltaic modules, perovskite modules, energy storage solutions, and other products have been showcased at professional exhibitions such as the Intersolar Europe in Munich 2023, Intersolar South America 2023, and the International Photovoltaic Power Generation Expo in Japan. These appearances provided global customers with high-quality, efficient, and reliable green energy solutions, contributing to the global energy transition.



GCL's photovoltaic industry chain showcased at Intersolar South America 2023.



GCL's FBR granular silicon product showcased at Intersolar Europe.

Deepen the Green and Low-carbon Actions

Green development serves as the foundation of high-quality development and the inherent demand of new quality productivity. GCL and its subordinate industrial sectors firmly integrate the concept of low-carbon environmental protection, greenness and sustainability into every aspect of their operation and management, strictly strengthen environmental management, improve clean and low-carbon operation mechanisms, and accomplish coordinated development of the environment and economy.

Addressing Climate Change

Climate change is a major global challenge for mankind today. GCL Group has established a climate change management system from four dimensions: governance, strategy, risk management and indicator targets, by referring to the International Financial Reporting Sustainability Disclosure Standard No. 2 - Climate-related Disclosures issued by the International Sustainability Standards Board (ISSB).

Climate Governance

In order to effectively manage climate risks and seize potential opportunities from climate change, we have integrated climate risk governance responsibilities into the existing ESG governance and management system. Leadership and supervision are carried out at the Group level; the ESG Committee regularly reviews and evaluates the Group's overall strategy and plan for addressing climate change; the ESG working group and each sector enterprise are responsible for identifying climate risks and opportunities based on production and operation conditions and taking corresponding measures.




Strategy

GCL Group identifies and analyzes both physical risks and transition risks and takes corresponding measures for the identified risks to enhance our resilience in dealing with climate change. At the same time, we also fully identify the changes in market preferences and business models that may be generated by climate change, and proactively seize new growth opportunities.

GCL Group's Main Climate Risks and Countermeasures

Risk category	Risk factors	Potential impact	Impact Period	Countermeasures	
Physical risks	Acute risks	Weather disasters such as heavy rain, floods and typhoons	• Production or transportation suspension; • Increase safety risks in the production process; • Fluctuations in the value of fixed assets.	Short/Medium term	• Formulate emergency response plans for extreme weather and organize emergency drills regularly; • Strengthen hazard detection and safety inspection of operating facilities and production equipment based on seasonal characteristics.
	Chronic risks	Extreme heat	• Hot weather brings challenges to the operation of production facilities and equipment; • High temperature increase the risk of power outages and cause production interruptions; • Increase safety risks.	Short/Medium term	• Optimize technical and management measures to ensure equipment safety and personal safety; • Improve emergency plans for power outages and ensure efficient electricity use during the peak summer period.
		Extreme low temperature	• Affect the normal operation of the unit or production facilities.	Short/Medium term	• Strengthen the maintenance and repairing of production equipment in winter in Inner Mongolia, Xinjiang and other regions, such as taking anti-freeze measures.
		Water shortage	• Water shortage affects production.	Medium/Long term	• Conduct water resource risk analysis and assessment; • Improve water resource utilization by using water-saving equipment and technologies to strengthenwaste water reuse, etc.
Transition risks	Market risk	Risk of changes in market demand	• The market has higher requirements for low-carbon products, and failure to adjust operating strategies in a timely manner will lead to a decline in market share.	Medium/Long term	• Understand customers' requirements for environmental performance; • Adjust marketing and service strategies according to market demand.
	Policy changes	Pressure of policy on GHG emission reduction	• Increased operating and procurement costs due to rising carbon market prices and the implementation of carbon taxes; • Fines-related losses caused by violation of laws and regulations.	Short term/long term	• Pay attention to domestic and international policies and regulations, and formulate corresponding measures to ensure the compliance of the company's operations; • Promote each sector and subsidiary to check GHG emissions.
	Technological changes	R&D and investment in low-carbon transformation technology	• The demand for low-carbon technologies has led to an increase in R&D and investment costs; • Lagging behind in low-carbon transformation technology may reduce GCL's competitive advantage.	Medium/Long term	• Develop and launch FBR granular silicon with ultra-low carbon emission and components produced using FBR granular silicon; • Stay updated with low-carbon cutting-edge technologies and achieve a reduction in our carbon footprint through technological iteration.
	Reputational risk	Stakeholders' demand for climate risk disclosure	• As external scrutiny increases, non-compliant disclosures or inappropriate climate performance could lead to reputational damage.	Medium/Long term	• Regularly disclose information related to climate change through ESG reports; • Participate in external occasions to exchange and communicate about climate change issues.

GCL Group's Key Climate Opportunities

	Opportunity Description	Measures
 <p>Business, Products and Services</p>	Increased market demand for green energy, low-carbon products and services	<ul style="list-style-type: none"> • Increase the proportion of renewable energy in business layout; • Keep developing new low-carbon technologies and products; • Provide customers with services such as green electricity trading, integrated energy management; offer zero-carbon solutions for multiple industries through integrated services such as "photovoltaic + energy storage" and "photovoltaic power, energy storage, charging and computing".
 <p>Use of Renewable Energy</p>	The use of renewable energy (such as distributed photovoltaics) helps companies save energy costs	Install renewable energy facilities such as photovoltaic panels in factories.
 <p>Expand Market Space</p>	Actively expand overseas markets (EU, Saudi Arabia, etc.)	Discover market growth opportunities in countries and regions that are actively promoting renewable energy projects.

Risk Management

GCL Group has integrated the identification and management of climate change risks into its existing risk management system. The overall control is carried out by the Group level, while each sector and subsidiary are responsible for the specific management of climate risks for the purpose of enhancing the company's ability to resist climate change risks and ensuring sustainable and stable operations.

Indicators and Goals

During the reporting period, the subsidiaries of GCL Group continued to improve their internal GHG emission management system, carried out carbon footprint assessment and carbon audit work regularly, and achieved refined management of energy consumption and carbon emissions. As of the end of 2023, 10 production sites completing GHG inventories. Some sectors such as GCL SI and GCL Tech included Scope 3 in the organizational carbon footprint assessment for the first time and disclosed it publicly. In 2023, the total GHG emissions of Scope 3 of GCL Group is 19,419,778.40 tons of carbon dioxide equivalent.

GHG Emissions of GCL Group⁸

Indicator Name ⁹	Unit	2022	2023
GHG Scope 1	Tons of carbon dioxide equivalent	9,201,244.85	11,819,648.75
GHG Scope 2	Tons of carbon dioxide equivalent	2,349,323.03	5,353,404.69
Total GHG Emissions (Scope 1 + Scope 2)	Tons of carbon dioxide equivalent	11,550,567.88	17,173,053.45
GHG Scope 1 Emissions Intensity	Tons of carbon dioxide equivalent/10,000 yuan revenue	1.78	1.96
GHG Scope 2 Emissions Intensity	Tons of carbon dioxide equivalent/10,000 yuan revenue	0.45	0.89
GHG Emission Intensity(Scope 1 + Scope 2)	Tons of carbon dioxide equivalent/10,000 yuan revenue	2.24	2.84

⁷Scope of statistics: Four listed companies under GCL.

⁸GHG Scope 3 statistics includes: Five subsidiaries under GCL Tech, namely, Jiangsu Zhongneng, Xuzhou Photovoltaic, Leshan GCL, Inner Mongolia Xinyuan, and Inner Mongolia Xinheng, covering emissions from transportation and indirect emissions from product use. GCL SI's statistical scope includes purchased goods and services, capital goods, fuel and energy-related activities, upstream transportation and distribution, waste generated in operations, business travel, employee commuting, upstream leased assets, and the treatment of sold products at the end of their life.

⁹Due to the increased production of GCL Tech and GCL SI, as well as the growth in GCL New Energy's business, GHG emissions have also increased. In the future, the company will continue to explore and implement diverse emission reduction measures, striving to reduce GHG emissions.



Environmental Management

By means of improving the environmental management system framework, GCL Group has strengthened guidance and supervision of the environmental protection work of its subsidiaries, enhanced knowledge education on environmental management, thus laying a solid foundation for environmental management.

Environmental Management System

The Group has established a three-level EHS management structure, including the EHS Management Committee and EHS Office at the Group level to coordinate the EHS management work; each industrial sector and its subsidiaries are mainly responsible for implementing environmental protection responsibilities. In addition, we actively promote the construction of an environmental management system. As of the end of the reporting period, our 26 subordinate enterprises passed the ISO 14001 environmental management system certification.

GCL Group's Three-level EHS Management Structure



Strengthen Capacity Building

We have improved our employees' professional capabilities and awareness of environmental protection in an all-round way by strengthening environmental protection knowledge training, conducting emergency drills for sudden environmental accidents, and holding advocacy activities.

In 2023



Jiangsu Zhongneng launched advocacy activity themed by "Building a modern society where people and nature coexist in harmony" on June 5th, the World Environment Day

The activity covers training for all employees and initiating signature campaigns, etc., to promote ecological culture and cultivate employees' ecological ethics. In addition, in order to prevent environmental risks, Jiangsu Zhongneng conducted special inspections on environmental emergency hazards during the activity and ensured timely rectification.



Jiangsu Zhongneng - Initiating Signatures on the "World Environment Day"



Energy Management

In compliance with the Energy Conservation Law of the People's Republic of China and other laws and regulations, GCL Group promotes the sector enterprises and subsidiaries to establish and improve internal rules and regulations, such as the Energy Management Manual and the Energy Management System Procedures, for continuous optimization of the energy management work mechanism. We also strengthen energy management through multiple measures such as technological transformation, energy management evaluation, and the construction of new distributed photovoltaic projects to optimize the energy structure.

Major Energy Management Measures Taken by GCL Group

Strengthening Energy Management	<ul style="list-style-type: none"> Improve the energy management responsibility system and energy management assessment system; Establish an energy monitoring system: implement centralized and unified management of electricity, natural gas, LNG and other energy sources, effectively combining energy scheduling with production scheduling, and promote energy optimization in the production process; Set energy-saving quota targets and execute indicators management: continuously improve the energy-saving supervision and guarantee system in each link of the whole process of energy conversion from fuel acceptance and supply → chemical energy → thermal energy → mechanical energy → electrical energy; Build an energy management system and carry out energy management evaluation.
Energy-saving Technology Transformation and Equipment upgrade	<ul style="list-style-type: none"> Improve the recycling of by-product steam through energy-saving transformation; Transform the original air conditioning and refrigeration systems or processes;
Optimizing Energy Structure	<ul style="list-style-type: none"> Photovoltaic panels installed on the roof of the factory, and the operation mode of "self-generation for self-use and surplus power to the grid" adopted to actively promote the use of green energy and realize the use of renewable energy of 67,507.59 MWh; Some factories or bases purchase green electricity; Leshan GCL achieves 100% green electricity supply.

Energy efficiency level recognized! Multiple clean energy operation projects have been acknowledged by the industry

During the reporting period, many clean energy operation projects under GCL were recognized by industry authorities for their superior energy efficiency levels, including:

- Among the 690 units of the same type benchmarked in the national energy efficiency in 2022 (released in 2023), Unit 5 of GCL Taicang Port Power Generation **ranked first** with a plant power consumption rate of 1.41%, and was rated by the China Electricity Council as the "unit with the best plant power consumption rate indicator" for 300MW subcritical heating and wet cooling units.
- Wuxi Blue Sky Unit 2, Taicang Port Power Plant Unit 5, and Nanjing Gas Turbine Unit 1 were awarded the title of "Benchmark Units".



Self-built photovoltaic power stations increased the proportion of renewable energy use

During the reporting period, Hefei GCL built a self-owned photovoltaic power station "Xinyu" with a total installed capacity of 28.41 MW. In 2023, its power generation reached 29.1845 million kWh, and self-generated and self-used electricity accounted for about 21.72% of the annual electricity consumption of the whole plant.



Hefei GCL Xinyu Photovoltaic Power Station

The self-generated electricity consumption accounts for approximately the entire plant's annual electricity consumption

21.72%

Energy Consumption of GCL Group¹⁰

Energy consumption indicators ¹¹	Unit	Data for 2022	Data for 2023
Natural gas	Standard cubic meter	1,962,037,985.05	2,248,007,261.04
Liquefied petroleum gas	Ton	3.76	5.18
Gasoline	Ton	237.59	1,202.24
Diesel fuel	Ton	1,811.55	3,102.87
Coal	Ton	3,126,142.14	2,990,375.72
Outsourced steam	Ton	1,529,494.60	2,314,540
Purchased electricity	MWh	3,336,621.905	8,344,795.59
Direct energy consumption	Ton of standard coal equivalent	4,845,503.05	5,008,419.14
Direct energy consumption density	Ton of standard coal equivalent/10,000 yuan revenue ¹²	0.94	0.83
Indirect energy consumption	Ton of standard coal equivalent	606,763.84	1,025,885.76
Indirect energy consumption density	Ton of standard coal equivalent/10,000 yuan revenue	0.12	0.17
Total energy consumption	Ton of standard coal equivalent	5,452,266.89	6,034,304.90
Energy consumption intensity	Ton of standard coal equivalent/10,000 yuan revenue	1.06	1.00

¹⁰ Comprehensive energy consumption is calculated in accordance with the "General Principles for Calculation of Comprehensive Energy Consumption" (GBT 2589-2020). The data scope includes:

GCL ET: natural gas, gasoline, diesel, coal, liquefied petroleum gas, outsourced electricity.

GCL SI: natural gas, steam, gasoline, outsourced electricity.

GCL Tech: natural gas, gasoline, diesel, coal, outsourced heat, outsourced electricity.

GCL New Energy: gasoline, diesel, outsourced electricity.

¹¹ Due to the increased production of GCL Tech and GCL SI, as well as the growth in GCL New Energy's business volume, there has been a certain increase in energy data for gasoline, diesel, outsourced electricity, and purchase outsourced steam. However, the comprehensive energy consumption intensity shows a downward trend.

¹² Operating revenue: The sum of the operating revenues of the four listed companies, with GCL Tech using the combined operating revenue from silicon wafers and silicon materials.

Water Resources Management

Water Risk Assessment

With reference to the Global Water Risk Assessment Tool (Water Risk Filter) of the World Wildlife Fund (WWF), GCL Group assessed the water resource risks of 20 domestic operating locations¹³ based on three aspects: physical risk, regulatory risk and reputation risk, and 12 risk items including the importance of biodiversity, the status of ecosystem services, water shortage, flooding, water quality, etc.

Various Types of Water Risks and the Number of Operating Sites

Risk Type	Risk Description	Number of High Risk	Number of Medium Risk	Number of Low Risk
Physical risk in the watershed	Risks related to water quantity, water quality and aquatic ecosystems caused by human activities and natural factors, including four major risk categories: water shortage risk, flood risk, water quality risk and ecosystem dependence.	10	9	1
Supervision risk in the watershed	Risks caused by government regulation of water resources, such as water rights, wastewater discharge pricing, water quality standards, etc.; including four major risk categories: policy environment risk, institutional and governance risk, management tool risk, infrastructure and financial risk.	0	0	20
Reputation risk in the watershed	The potential risks brought by negative public opinion are mainly reflected in the public's understanding of water, the density level of local culture quantity and the degree of media attention; four major indicators are considered: the importance of water in local culture and local biodiversity, level of media attention and the risk of hydrological conflicts.	20	0	0

¹³ The operational locations include the main production bases and administrative management centers of GCL SI and GCL Tech, which are subsidiaries of the GCL Group.



Water Risk Management

Based on the results of the water resource risk assessment, the main production units under GCL Group developed targeted management strategies in line with their own operating conditions to control and mitigate future risk of water resource shortage from a forward-looking perspective.

Physical Risk in the Watershed

- Strengthen water resource management and elevate water resource utilization via water-saving technology reform and water reuse;
- Pay attention to extreme weather such as rainstorms and floods, and improve relevant emergency plans;
- During the process of project construction and operation, focus on protection of biological habitats and local water and soil.

Supervision Risk in the Watershed

- Strictly comply with national and local laws and regulations on watershed protection;
- Water intake and drainage must strictly follow regulations;
- Maintain communication with local governments and environmental protection departments.

Reputation Risk in the Watershed

- Carry out public welfare projects and volunteer activities for water resource protection to improve corporate brand image.

Water-saving Measures

GCL Group and its subordinate industrial sectors have improved water resource utilization and conserved water resources by bolstering water resource management, focusing on reclaimed water reuse, wastewater reuse, rainwater collection and reuse, industrial water cooling reuse, water-saving technical transformation and other measures. In 2023, many subsidiaries of the Group were awarded the title of water-savers.

Water-saving Measures

Enhance Water Conservation Management and Perform Water Balance Testing

- Establish a water-saving management system, improve water use management system, metering management system, maintenance system, reward and punishment system, etc.;
- Quantify and refine responsibility targets and indicators;
- Many companies including Funing GCL, Gaoyu Gas Turbine, and Gaozhou Thermal Power have completed water balance tests.

Strengthen Water Resource Recycling and Reuse

- Henan GCL: The silicon-containing wastewater, after cleaning and polishing, is discharged into the sedimentation tank of the sewage station, and recycled after sedimentation and flocculation, **with a reuse rate of 65%**;
- Xinhua Semiconductor: By implementing measures such as recycling cooling water and condensed water, and reusing industrial water, the company reduced its daily water consumption and saved **322,800 m³** of production water;
- Leshan GCL: Recycled water is used in production links such as slurry treatment and lime water preparation in wastewater treatment plants, **with a recycling rate of 99.02%**;
- North Gas Turbine: The commissioning of the circulating water replenishment system was successfully completed in January 2023, **effectively saving 50% of the total annual water extraction cost**;
- Xuzhou Recycling Resources: efforts were made to improve the comprehensive recycling of wastewater such as ultrafiltration and nanofiltration concentrated water;
- Taicang GCL and other subsidiaries achieved **100% recycling** of industrial water throughout the plant.

Perform Water-Saving Technical Reform and Equipment Transformation

- Carry out independent reuse and renovation of the concentrated water system to increase the total amount of water storage tanks and effectively reduce the tap water replenishment caused by water consumption fluctuations;
- Xuzhou Xinyu: The condensate water pipeline renovation project was conducted to connect the condensate water to the tap water pool for use, which is estimated that 14,100 tons of tap water can be saved each year, with direct economic benefits of RMB 54,285 yuan.

Install Water-Saving Facilities

- Composite air coolers were installed. When the temperature is low (below 12°C), the water spray for cooling will be stopped and switched to air cooling. The water consumption is only 1/3 of that of water cooling.
- A sludge dewatering system was set up in the water purification station to recycle the self-used water in the reaction sedimentation tank and reduce the use of fresh water.



Suzhou GCL Won the Title of Water Efficiency Leader

Suzhou GCL Photovoltaic Technology Co., Ltd. implements a three-level water-saving management system, including a water-saving leading group, headed by the general manager, and water-saving management group by each team to be responsible for the water-saving, water-calculation and metering management. At the same time, it has established and improved water-saving management systems, metering management systems, maintenance systems, and reward and punishment systems. In December 2023, it was awarded the title of "Water Efficiency Leader" by the Suzhou Water Affairs Bureau for its outstanding performance in improving water efficiency.

During the Reporting Period, the Water Resource Usage of GCL Group is as Follows:¹⁴

Comprehensive water consumption	The amount of recycled water	Proportion of recycled water usage	Water use intensity
53,553,040.99 tons	35,317,113.11 tons	65.95%	8.86 tons/RMB 10,000 revenue

Wastewater Discharge

The sector enterprise under the GCL Group have formulated relevant management systems for wastewater discharge, and follow the principles of separation of clean and polluted water, classified governance, and polluted water treated for discharging to clean water facilities. They also reduce wastewater discharge by optimizing production processes, upgrading water treatment facilities and equipment, and strengthening wastewater reuse. Based on products and processes, they are equipped with wastewater treatment processes and facilities that meet production and environmental protection requirements, and monitor the quality of drainage water in real-time according to regulatory requirements to ensure compliance with discharge regulations. Of them, Inner Mongolia Xinyuan and Inner Mongolia Xinhuan have achieved zero discharge of production wastewater.



Jiangsu Zhongneng refined production to reduce wastewater discharge

In 2023, Jiangsu Zhongneng further optimized the granular silicon production process and effectively reduced wastewater discharge by reducing the amount of slurry neutralization, increasing the recovery rate of chlorosilane, and improving the operating efficiency of the drum. In this year, it reduced wastewater discharge by more than 503,000 tons and suspended solids discharge by about 57.47 tons.

During the Reporting Period, the Wastewater Discharge Data of GCL Group are as Follows:

Total wastewater discharge is	The wastewater discharge density is
13,753,493.79 tons	2.28 tons/RMB 10,000 revenue

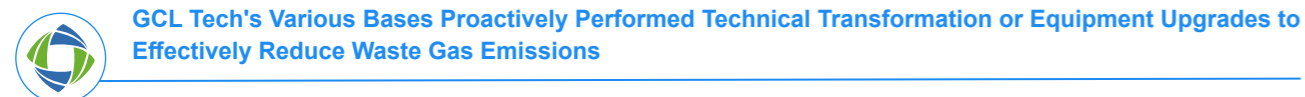
¹⁴ Scope of statistics: Four listed subsidiaries under GCL Group.

Emissions Management

GCL Group strictly abides by the "Law of the People's Republic of China on the Prevention and Control of Air Pollution" and other environmental management standards, and ensures the compliance of waste discharge and disposal through source control, process control and emission control.

Exhaust Emissions

The Group's subsidiaries have used targeted waste gas treatment facilities based on the waste gas generated in the production and operation process to ensure that the waste gas is discharged in compliance with regulations. Taking GCL ET as an example, its main types of atmospheric pollutants emitted are SO₂, NO_x and smoke. GCL ET uses wet desulfurization, low-nitrogen combustion + SNCR, SCR + SNCR, bag dust removal, electric bag dust removal, wet electrostatic precipitators and other equipment and process technologies to treat atmospheric emissions. All operating coal-fired thermal power companies under the Group have completed ultra-low emission transformation and met both national and local emission standards. During the reporting period, no excessive waste gas emission incidents occurred in GCL's subsidiaries.



Production Process of FBR Granular Silicon:

Jiangsu Zhongneng has significantly reduced air pollution through measures such as centralized collection and treatment of waste gas and technical improvements to waste gas treatment devices. In this year, it dismantled 9 exhaust pipes, reducing dust emissions by 1.95%, NO_x by 2.66 tons, and SO₂ by 0.24 tons year-on-year; Leshan GCL implemented the renovation of hydrolysis tanks and directly transported the hydrolysis waste gas to the waste gas elution tower for treatment, which effectively solved the waste gas emissions caused by incomplete hydrolysis in the slurry section. The system has a slurry processing capacity of 0.2 tons per hour and a daily processing capacity of up to 4.8 tons.

Slice Operation:

Xuzhou Crucible upgraded the VOC_s treatment process, and achieved effective removal of VOC_s through centralized collection, dry filtration, activated carbon adsorption and catalytic combustion desorption. After treatment, the VOC_s concentration in the exhaust gas dropped to below 1mg/m³, far below the national emission standard of 60mg/m³.

During the Reporting Period, the Waste Gas Pollutant Emissions of GCL Group¹⁵ are as Follows:

Indicator Name	Unit	Data for 2022	Data for 2023
NO _x	mt	2,136.94	2,039.13
SO _x	mt	376.74	308.28
Dust	mt	78.43	90.32

¹⁵ Statistical scope of emission data: Four listed subsidiaries under GCL Group, namely GCL ET, GCL SI, GCL Tech, and GCL New Energy.

Waste Management

The Group and its enterprises at all levels strictly abide by the relevant laws and regulations, such as the State Law on the Prevention and Control of Environmental Pollution by Solid Waste and the National List of Hazardous Wastes, formulated internal systems and procedures, such as the Waste and Hazardous Waste Management Control Procedures and the Solid Waste Management System. We strictly control the classification, storage and disposal process of hazardous waste and general industrial solid waste, clarify the responsibilities of supervisors, and ensure the compliant waste disposal. Among them, hazardous waste is handed over to qualified units for compliant disposal. For general solid waste, such as waste battery cells and waste packaging materials, re-resource and harmless management is implemented.

During the Reporting Period, the Solid Waste Emissions of GCL Group are as Follows:

Indicator Name	Unit	Data for 2022	Data for 2023
Hazardous waste	Ton	68,240.01	52,047.41
Hazardous waste emission intensity	Tons/RMB 10,000 Revenue	0.01	0.01
Non-hazardous waste	Ton	1,094,791.71	1,038,155.02
Non-hazardous waste emission intensity	Tons/RMB 10,000 Revenue	0.21	0.17
Recyclable waste	Ton	31,570.44	52,184.85



Interior of Taicang Port Power Plant

Biodiversity Conservation

While promoting the development of green industries, GCL incorporates biodiversity protection into the entire process of project planning and design, project construction, and operation management. In the project planning and design stage, full consideration is given to the impact on the ecological environment; in the project construction stage, strict control is exercised on the impact of waste, noise, etc. on the surrounding environment; in the project operation stage, environmentally friendly green production is practiced to boost the harmonious coexistence of society and nature.



Leshan GCL accomplished ecological design for the park

In the early stage of designing the park, Leshan GCL retained more than 28% of the original ecological mountain area, as well as the native tree species (tung trees, giant eucalyptus, etc.) and original water bodies. After the factory was built, more greening efforts were made, and the mountain greening area exceeded 70% of the original one. In addition, more than 20 varieties of herbaceous and shrub ground cover plants were planted. Thanks to the concept and practice of ecological protection, the park has a beautiful mountain ecological environment, attracting many animals such as leopard cats, squirrels, and civets to inhabit and reproduce here.



Leshan GCL Park Environment

Create a Zero-carbon Office

GCL Group practices the green and low-carbon concept from multiple dimensions, including park design, renewable energy facilities, energy-saving management of office buildings, promotion of low-carbon mobility, and advocacy of low-carbon life. In early 2023, GCL Energy Center obtained the authoritative carbon neutrality certification, becoming the first zero-carbon headquarters in Suzhou that received this certification.

GCL Energy Center creates a zero-carbon office space with leading low-carbon design and technology

GCL Energy Center, the headquarters park of GCL, uses the "six-in-one" micro-energy network technology to achieve comprehensive energy supply, and applies 100% green electricity for daily operation. Among them, more than 50% is self-supplied green electricity from photovoltaic, natural gas distribution, wind power, etc. In addition, based on our own technological advantages, the leading zero-carbon technologies such as perovskite and photovoltaic thermal heat pump system (PVT) have been employed in the park to further increase the "green content" of the park.



GCL Academy (restaurant) adopts photovoltaic thermal heat pump system (PVT)

GCL Energy Center

Daily operation using green electricity

100%

Self supplied green power capacity exceeds

50%



The "photovoltaic+storage+charging" energy station in the GCL Energy Center provides employees with "one second, one kilometer" supercharging



Advanced Management

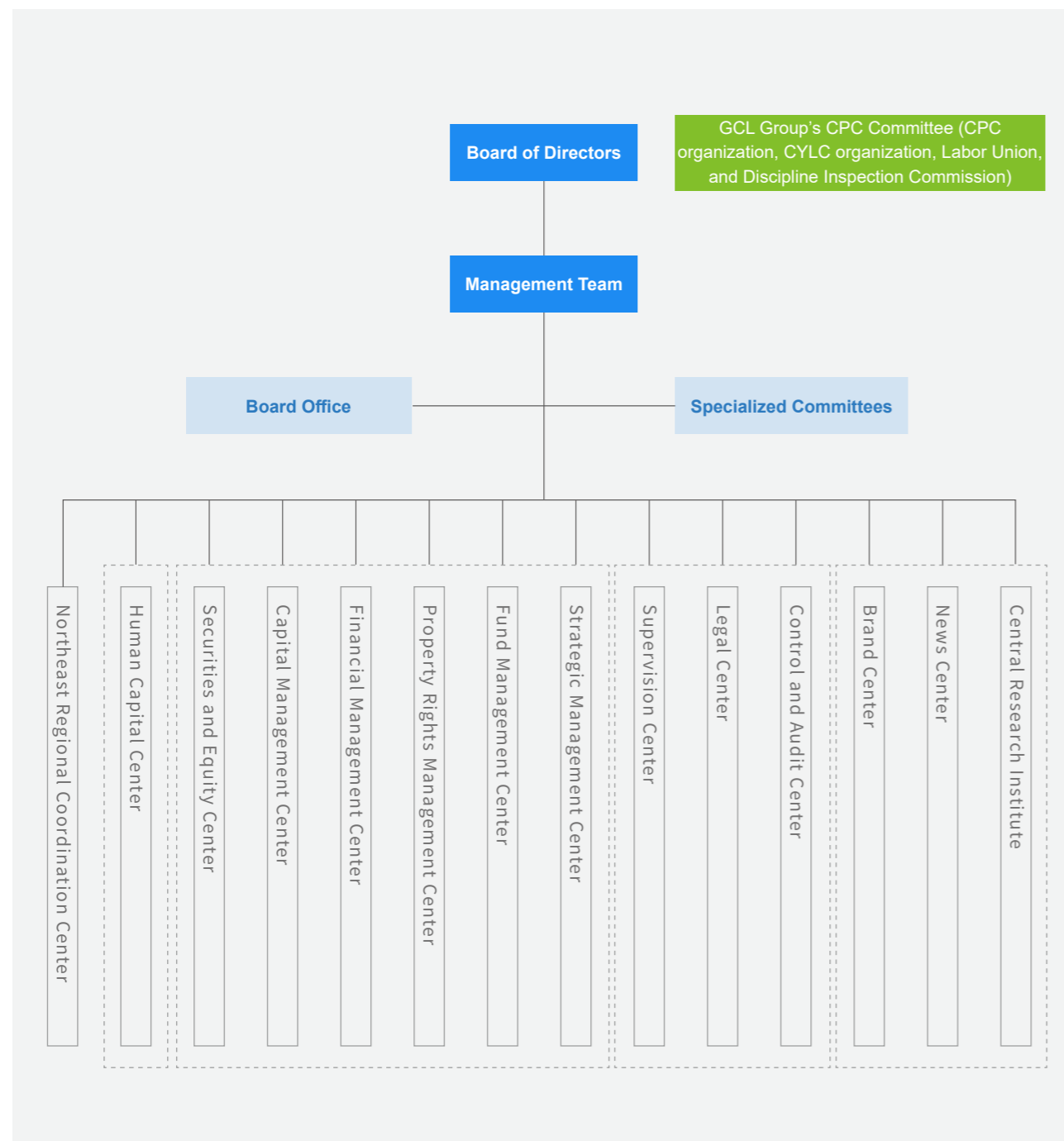
GCL Group consistently optimizes our business layout from the perspectives of technological foresight and industry development, maximizing synergies across our sectors. We have established a comprehensive "major risk control system," including risk management, compliance, auditing, and supervision, to strengthen safety production. Additionally, GCL promotes interactive projects such as CPC building and corporate culture, laying a solid foundation for the robust development of the enterprise.



Corporate Governance

The high level of corporate governance of GCL Group can guarantee its long-term and stable development. We have established a comprehensive corporate management structure, with the Board of Directors as the highest decision-making body, and eight management committees under it to systematically control our overall growth. These initiatives have consolidated the management foundation of our business development and improve our decision-making level.

GCL Group's Organizational Structure



Risk Management and Internal Control

GCL Group keeps bolstering risk management and control. In response to various risks involved in operations, such as strategic management, legal compliance, safety, health and environment, we clarify the responsibilities of the "four lines of defense" (i.e., operating units, functional departments, risk control functions, internal audit functions and supervisory functions), form a joint defense mechanism, and weave a solid risk control network. At the same time, a major risk control system is established by internal control, auditing, legal center, supervisory center and other lines, with regular communication and collaborative cooperation to jointly provide a firm basis for stable operations.

Risk Management

Improve the Risk Management and Control System

GCL Group has established a complete risk management framework covering the Group, its industrial sectors and its subsidiaries, and built a risk quantification indicator system, taken measures such as major decision-making risk identification, important business risk warnings, and risk indicator monitoring mechanisms to strengthen risk supervision and control. During the reporting period, we formed a more comprehensive risk management and control system by improving risk control management, innovating management concepts, promoting process reform and optimization, and information-based empowerment.



Improve Risk Control and Management

- **Improve management system:** Complete 13 system updates and releases for 11 related management systems, such as risk and internal control throughout the year; strengthen detailed rules and deepen management requirements;
- **Organizational system optimization:** Carry out job rotation, build a diversified team, and strengthen risk control communication among different lines.



Process Reform and Optimization

- **Set up a process management committee:** Conduct special inspections on process design and operation, implementation of using specifications, etc.;
- **Process reconstruction:** Optimize and reconstruct the business processes of 6 key functional departments at the Group headquarters by adopting Huawei model;
- **Prepare process manuals:** One headquarters public process manual and 10 functional professional process manuals produced in 2023.



Concept Innovation

- **Penetrate into business:** Lead business with risk and steadily carry out risk control projects throughout the year in 12 provinces and cities in China by going to the frontline, diving into the base, penetrating into the front line, and appearing at the site;
- **Management Shift Forward:** Establish a "full-chain risk management system before, during and after the event" to enhance proactive management capabilities; improve pre-warning, formulate response plans and warning indicators for identified risks, and strengthen in-process control.



Information-based Empowerment

- **Risk management platform system:** Undertake the risk management system and gradually realize the construction of risk control coordination, daily monitoring and timely reporting; the first phase of the project has been launched, realizing the online management and tracking function of the entire process of major risks;
- **Process mining information platform:** A visual, quantifiable, and real-time process monitoring platform covering EC, SAP, GCL Intelligent Chain and other systems to promptly detect business bottlenecks and anomalies.

Construction of Risk Management Culture

In order to improve the risk awareness and management level of all staff and create a good atmosphere for all to participate in risk management, GCL Group has continuously strengthened the construction of corporate risk management culture by organizing training, compiling training materials, WeChat official account, internal magazines, etc., to intensify the publicity, education, and training on the value orientation, concepts, knowledge about risk management, etc.

Internal Publication of Risk Control

Contains 16 articles involving risk management, internal control compliance, the three major issues and use of big amount of capital, to strengthen the risk management awareness of various functional departments.

Contains **16** articles



Risk Control Official Account "Xinfengxiang"

Posting 14 articles on WeChat official account to carry out regular risk communication and advocacy and receiving over 8,300 views.



Small seal, big responsibility

As an important asset of a company, seals have great legal effect, and their use and management directly affect the safety and interests of the entire group.



「Securities Compliance」2023 A-share Market Violation Punishment Case Sharing - Market Ban

In addition to building a risk management culture for all employees, we provide internal training and external agency training for employees in the risk control line. Throughout the year, the risk control line organized 94 training sessions that covered 3,662 people, 8 external bench-marking study visits and received 4 external bench-marking study visits, helping employees broaden their horizons on thinking and perspectives of external risk control.



Participating in external learning and exchanges

Compliant Internal Control

GCL Group has continuously strengthened internal control and risk prevention by building an authorization system with GCL characteristics, conducting internal control evaluations, and strengthening regulatory bench-marking. During the reporting period, the Group conducted an overall top-down streamline of the authorization system, modularized and standardized the authorization management, and fully assisted management innovation; the Group and its sector enterprises conducted 254 internal control assessments throughout the year and adopted compliance inspection, bottom line management, and violation accountability mechanisms to strengthen compliance supervision. In addition, in 2023, we established risk control capital-end tentacles for listed companies, paid attention to external regulatory penalties; released the Group's regulatory reports in stages, publicized new regulations and key hotspots, selected 18 comparable companies in the photovoltaic industry to analyze and compare PE, ROE and other 22 indicators, tracked and organized 1,937 regulatory penalties for A-share listed companies. As a result, the compliance management was comprehensively strengthened.

In 2023, the entire Group was punished 0 times by external regulatory authorities.

Internal Audit

During the reporting period, the Group established an Audit Committee to review, decide and coordinate the Group's audit management related work; the Audit Management Center is responsible for economic responsibility audits, special management audits, efficiency audits, departure audits, anti-corruption audits, etc., to promote management improvement, cost reduction and efficiency improvement, and rectification of violations, and drive the continuous progress of risk and internal control management. In 2023, the overall construction of the Audit Management Center has planned an "audit management system" to promote the construction of digital audits.

Business Ethics

Business ethics is not only a guide for corporate behavior, but also a key factor in winning the respect and trust of the market. GCL Group has always adhered to the principles of honest management and fair competition, pursued a corporate culture of incorruptible practice, and worked hard to build a "clean GCL".

Anti-corruption and Anti-bribery

GCL Group has a zero-tolerance attitude towards corruption. During the reporting period, we revised the Anti-Corruption Regulations and the Reward and Punishment Management Measures, and continued to improve the anti-corruption system. The second inspection team of the GCL Group Discipline Inspection Commission was established to participate in the construction of a major risk control system, set up a long-term communication mechanism with the supply chain department, and fortify the internal anti-corruption system control. In addition, GCL strengthened cooperation with public security, procuratorial and judicial organs, and the anti-fraud alliance, deepened the integration and connection with resources in all sectors of society, improved the awareness of integrity, and created a good atmosphere for collaborative case handling.



Seminar on private enterprise compliance investigation

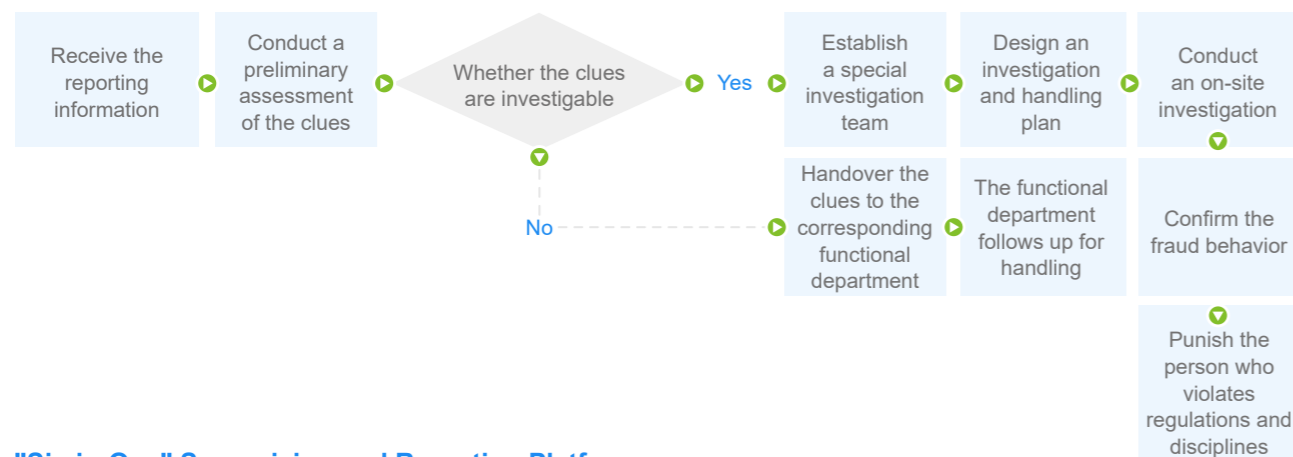
In July, the Supervision Center of GCL Group and the Wujiang District Commission for Discipline Inspection of Suzhou co-organized a "Seminar on Private Enterprise Compliance Investigation". The general manager of the GCL Supervision Center shared the process, practices and results of our compliance investigation based on our actual operation and typical cases, and emphasized the importance of corporate integrity and compliance.



Reporting and Protection

GCL has established clear reporting channels, reporting handling procedures and whistle-blower protection mechanisms. We have built a "six-in-one" supervision and reporting platform, which innovated internal reporting methods, embedding reporting channel information into each employee's computer desktop to collect reporting information extensively. In addition, we strictly keep the whistle-blower's personal information and all reporting materials provided by the whistle-blower confidential to prevent leakage or loss; any form of retaliation is strictly prohibited. If the whistle-blower suffers from any form or degree of retaliation, he or she is encouraged to report to the relevant department as soon as possible.

Process for Handling of Reports



"Six-in-One" Supervision and Reporting Platform

The Group's official website	Mobile Client
WeChat official account: "Clean GCL"	Email: Jubao@gcl-power.com
Tel: 0512-68538110	Address: GCL Supervision Center, F/6, GCL Energy Center, No. 28 Xinqing Road, Suzhou Industrial Park

Building a Culture of Integrity

We continue to drive the construction of an integrity culture, requiring new employees to sign the "Managers' Code of Conduct"; establish a party member's integrity commitment mechanism, prepare and sign the "Party Member's Honest and Self-Discipline Commitment"; and constantly improve employees' awareness of integrity and compliance by organizing integrity training and posting relevant cases. During the reporting period, the Group Supervision Center went to Leshan and other places to conduct a total of 22 offline internal and external training sessions, and posted 21 related articles online.

Integrity and compliance training

The Group held a themed training in Xinjiang in August 2023. This training was provided from the perspectives of management and employees, combining classic cases to strengthen the awareness of integrity. After the training, the Group Supervision Center issued its contact card to the trainees, encouraging employees to report fraudulent behavior in a timely manner for joint maintenance of a clean and green corporate environment, and escorting the integrity construction of GCL.

Led by CPC Building

GCL regards the "red gene" as the spiritual motivation and cultural source of all GCL people. This year, GCL's CPC organizations at all levels comprehensively studied, publicized and implemented the spirit of the 20th CPC National Congress, fully carried out the themed education of studying and implementing Xi Jinping's Thoughts on Socialism with Chinese Characteristics for a New Era. By practicing the CPC building concept featured by "red leadership, green development", we kept advancing the normalized and long-term CPC history learning and education. We successfully completed the election of the Group's CPC committee and formed a new model empowered by "digital CPC building". With excelled, promoted and strengthened organizational construction, we enriched the three-dimensional network featured by CPC building and co-construction, and innovated the model of mass organizations and culture led by CPC building.

During the reporting period, GCL Group was awarded the title of "National Power Industry CPC Building Brand Influential Enterprise in 2023" by the "Electricity and Culture Today" magazine of the China Electricity Council, further expanding the brand influence of GCL's CPC Building in the power industry across China.

Strengthen CPC's Ideological Construction

In 2023, GCL comprehensively studied, publicized and implemented the spirit of the 20th CPC National Congress through a series of themed CPC Day activities, knowledge contests, publicity and joint learning initiatives in key projects, etc. As a model unit for learning and guidance in city-level thematic education, GCL intensely advanced the study and implementation of the socialist ideology with Chinese characteristics in the new era, whose work was recognized by many parties. At the Thematic Education Promotion Conference in Suzhou Industrial Park, GCL was the only enterprise representative to share views on the theme of "Study and Shoulder Responsibility, Endeavor in Work to Create a New Landscape". In addition, as the first private enterprise in China to establish the "Yan'an Spirit Research Association", GCL continued to boost the normal and long-term CPC history learning and education, and consolidate the foundation of CPC building.



Comprehensively study, propagandize and implement the spirit of the 20th CPC National Congress

Knowledge Contest on the "Study of Spirit of the 20th CPC National Congress"



Constantly promote the normal and long-term CPC history learning and education

In July, the large-scale photo exhibition titled "Red Flag Canal Spirit Endures Forever" were exhibited at various front-line enterprises of GCL.

Themed education of studying and implementing Xi Jinping's Thoughts on Socialism with Chinese Characteristics for a New Era



In October, GCL Group's CPC Committee held a thematic meeting on studying and implementing Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era at the GCL Energy Center.



The Group's CPC Committee held a demonstration training course for concentrated rotation training of secretaries of front-line CPC organizations.

Organizational Building

GCL Party Building has formed a relatively complete system of organizational management, organizational development, and training of key talents. During the reporting period, GCL successfully completed the replacement of the group's party committee, with Vice Chairman and President Zhu Yufeng once again serving as the group's party committee secretary; Carry out excellence promotion and strengthen organizational construction, with 100 branches reaching the standard for promotion within the year; Comprehensively implement the system of party affairs workers holding certificates for employment in all grassroots organizations of the group, and strengthen the construction of the "two teams".¹⁶

The Party Committee of the Group continues to strengthen the vanguard and exemplary role of Party mass organizations and Party members in promoting the strategic goals of the "Three Great Xiexin". In the group's key construction projects, "black technology" projects, "digital transformation" projects, new formats and new businesses, grassroots party organizations and party members actively act as pioneers, assault teams and leaders, bravely shoulder missions, pursue excellence, work together to overcome difficulties, and ensure significant breakthroughs in core technologies.



The Second Party Committee of GCL Group



Inner Mongolia Xinyuan will promote the "Three Brightnesses" theme practice activity - "Party members show their identity, projects show progress, and production shows quality" - among all grassroots party organizations in the sector, in order to gather a strong red driving force and lead the enterprise to continuously move forward.

¹⁶ Two teams: respectively refers to the "team of party workers" and the "team of party branch secretary".



By the end of 2023, GCL Group had:

CPC members	CPC Committees	CPC General Committees	CPC branch Committees
More than 3,500	16	4	115

Co-construction with CPC Building

Co-construction with CPC building helps deepen the integration of CPC building, business and management, and expands the industrial chain, work chain and service chain led and empowered by the "CPC building chain". GCL has built a multi-dimensional co-construction model, formed a three-dimensional and diverse co-construction network, and advanced the integrated development of CPC building consortium, industrial consortium and governance communities. In 2023, the CPC Committee of the Group and the CPC Committee of Suzhou Branch of China CITIC Bank achieved full co-construction at both the CPC Committee level and the branch level, becoming a case of bank-enterprise co-construction to promote high-quality growth of the real economy; A "Chasing Light Pioneer" CPC building community with Procuratorate and Court of the Suzhou Industrial Park was set up to jointly improve the grid-based construction level of front-line CPC organizations.



In November, the Group's CPC Committee was invited as the only corporate representative to participate in the CPC Building Promotion Conference of Suzhou Industrial Chain.

Cultural Escort

As long as the culture and spirit are not lost, the power will be multiplied, the green mountains will always stand and clear waters will flow forever.

—Zhu Gongshan

In 2023, GCL developed interactive system projects including corporate culture construction, CPC building, and human capital management, creating a distinctive corporate culture construction system for GCL. These moves have not only subtly enhanced employees' sense of identity and cohesion with corporate culture, and inspired them to love their jobs, be dedicated to their work, and take on major responsibilities, but also showcased the company's image in multiple external exchanges and enhanced the competitiveness of corporate culture.

Cultural Construction

During the reporting period, the content of GCL's corporate culture was further precipitated and enriched: the GCL Craftsman Declaration and the oath of the GCL Basic Law were summarized; the "Wutongqiao Spirit" was released, and the "Symposium on Promoting the GCL Spiritual Pedigree" was held to further broaden the corporate spiritual pedigree; and innovative practices in corporate culture construction were actively carried out through activities such as drawing the "12 GCL Constellation - Approaching the GCL Basic Law" and conducting corporate culture research. In addition, we helped Jiangsu Xinhua Semiconductor Technology Co., Ltd., one of our subsidiaries, to compile and release the "New Corporate Culture Atlas of Xinhua Semiconductor", injecting strong spiritual power into the long-term development of the company.

On this basis, GCL gives full play to the autonomy and creativity of the Group's labor union and communist youth league through their building led by CPC building. We also promote the Group's mass work and corporate culture construction to continuously reach new levels with the innovation of leading models, service models, and activity models.

Enhance External Communication and Showcase the Corporate Image



GCL's entrepreneurial history exhibited at Jiangsu, Hong Kong and Macao Youth Development Forum

In October 2023, Zhu Yufeng, the President of GCL Group, attended the 13th Jiangsu, Hong Kong and Macao Youth Development Forum. During the forum, the themed audio, poetry and painting performance "Chinese Youth Striving Forward" not only highlighted GCL in the plot, but also included many frames of pictures and video materials reflecting GCL's "Xin Haikang Spirit" and "Zhongneng Spirit" in the background.



Participated in the opening ceremony of the 3rd Cross-Strait Youth Culture Month

In July 2023, the Chorus of GCL Group was invited to participate in the opening ceremony of the 3rd Cross-Strait Youth Culture Month.

Enhance Employees' Understanding of Corporate Culture and Elevate their Sense of Identity and Pride



Organize the event titled 2023 "Frontline Employees Visit Headquarters" for the first time

The Group selected 20 front-line employees from enterprises in Ethiopia, Xinjiang, Inner Mongolia and other places who went to the headquarters in Suzhou, Jiangsu on October 28 for participation in "GCL Day" and other related activities.



"GCL New Employees' Footprint Project & MINI Cultural Study Tour"

Through activities such as visiting benchmark enterprises (cultural bases) under GCL, the understanding of GCL was deepened, interaction and friendship among new employees were enhanced at the same time.

Vigorously Promote the Spirit of Model Workers, Labor Spirit and Craftsmanship, and Stimulate the Creative Potential of Employees



Zhang Huali Innovation Studio

Named after Zhang Huali, the national May 1st Medal winner, it has cultivated more than ten technical talents in the two years since its establishment and created over RMB 20 million yuan in benefits for the enterprise.



The "Craftsman Studio" of Taicang Port GCL Power Generation Co., Ltd. was unveiled.

Honorary Recognition

During the reporting period, GCL's corporate culture construction work was recognized by many parties. Of them, "GCL Academy Corporate Culture Path Construction and Exploration" was awarded the second prize of "Excellent Achievements in Corporate Culture Construction" by the China Enterprise Culture Improvement Association, and "Effectively Operating Corporate University and Promoting Corporate Culture Construction" was granted the first prize of "Excellent Achievements in Corporate Culture" by the Jiangsu Enterprise Confederation.

Various front-line enterprises won numerous honors at or above the provincial level in terms of CPC building-led construction of mass organizations, and corporate culture construction, including Jiangsu Zhongneng winning the 2023 "National May 1st Labor Award" issued by the All-China Federation of Trade Unions; the dispatching team of the production and operation department of Jiangsu Zhongneng successfully promoted to win the "Two-Star National Youth Civilization Unit"; Jiangsu Zhongneng's granular silicon branch and Xuzhou GCL Photovoltaic Production and Manufacturing Department both awarded the honorary title of "Jiangsu Workers Pioneer" from Jiangsu Federation of Trade Unions. These honors not only represent acknowledgment of outstanding employees and collectives, but also a high recognition of corporate culture construction work.



In April 2023, Jiangsu Zhongneng was awarded the "National May 1st Labor Award" by the All-China Federation of Trade Unions.

Safety Serves as Foundation

Safety means getting it right the first time and every time. GCL Group has always placed safety in production at an important position, firmly established the concept of safe development, continuously improved the safety production management system, enhanced emergency management capabilities, strengthened the advocacy of safety culture, and ensured the occupational health and safety of employees. At the same time, we achieved digital management of safety production with S&T means and continuously built a long-term mechanism for safety production.

Strengthen Safety Management

GCL Group conscientiously implements the decisions and arrangements on work safety decisions of the CPC Central Committee and the State Council, executes the Work Safety Law and other laws and regulations, adheres to the principle of "safety first, prevention foremost, and comprehensive management", establishes and effectuates the GCL EHS management concept of "safety is the root, efficiency is the basis, and environment is the priority", sets up and improves the work safety responsibility system for all, strengthen safety risk management, boosts the standardization and digitalization of work safety, puts the focus of safety management on the front line of enterprise teams, and continuously consolidates the safety foundation.

Key Measures of GCL Group to Strengthen Production Safety Management

Improve the Institutional System

Develop institutional documents such as the "Management System of Safety, Health and Environment Management", "Management System of Safety, Health and Environment Incidents", "Safety, Health and Environment Assessment Measures" and "Safety, Health and Environment Emergency Plan".

Promote High-quality Safety Standardization Construction Starting from Level 2

Each sector is required to set the guiding ideology for the construction of safety production standardization featured by "relying on full participation, self-construction and supported by external agencies". By means of the level 2 safety standardization construction, the gaps are identified, rectification plans are formulated, and various kinds of management capabilities are improved.

Implement the Management of the Safety Performance Checklist for the Main Responsible Persons of Enterprises

GCL has developed a practical, executable, and quantitatively assessable safety performance checklist template for main corporate responsible persons, which is implemented throughout the Group and tracked and supervised on a monthly basis to boost them to take the lead in fulfilling their safety responsibilities.



Guided by the "Three Models and One Digitalization", the Group adopts the "Front-line Work Method" to inspect safety, health and environmental protection work

The Group practices the "Front-line work method", formulates monthly research and inspection plans, as well as standardized templates for research and inspection outlines targeting different business formats, monthly researches and inspects enterprises their safety, health and environmental protection work, investigates and rectifies common problems found in the Group for effective improvement in the level of safety management.



The Group conducts in-depth research on the safety, health and environmental protection work of sector enterprises.

Build a Solid Security Line

During the reporting period

Investment in production safety was

199,534,000 yuan

Emergency drills for production safety

3,455

Improve the Dual Prevention Mechanism for Safety Risks and Hazards

The dual prevention mechanism serves as an important measure to ensure safe production. GCL Group has achieved source control and system management of safety production risks through the organic combination of safety risk classification control and hazard investigation and management. GCL Group's various sector enterprises and directly affiliated companies continue to establish and improve relevant internal systems, such as the "Dual Prevention Mechanism" and "Safety Risk Identification and Control System" to effectively carry out safety risk control and hazard investigation and management; the person in charge of safety production in each enterprise regularly leads a team to conduct safety risk control and hazard investigation and management on the production site, implements rectification and management of safety hazards found during inspections, and regularly reports the investigation and management situation for safety risks, hazards and on-site inspection photos to the management system for filing.



Suzhou Lantian, a subsidiary of GCL ET, conducts potential safety hazard investigation



Comprehensive emergency drill for ammonia leak fire in Kunshan Lantian



Emergency evacuation drills and fire training activities held by GCL Energy Center



Xinhua Semiconductor established emergency rescue team and regularly conducts capacity building and unscripted drill evaluations for their members



Jiaxing Thermoelectric conducted emergency drill on desulfurization tower slurry leakage endangering rain outlet

Digitalization of Safe Production

GCL continues to explore how to use digital technology to empower safe production and improve the level of inherent safe production. Many subsidiaries under the Group have applied technologies such as AI, automatic video recognition of violations, and automatic disconnection of online alarms in daily operations to improve the quality and efficiency of safe production management.



Xinhua Semiconductor established an AI hazards analysis system for employee safety behavior to strengthen management of the entire process of special operations

Informatization of work permits

Implement informatization management of the entire process of application, review, permit, supervision, and acceptance of special operations;

Real-time monitoring and video storage of the entire operation process

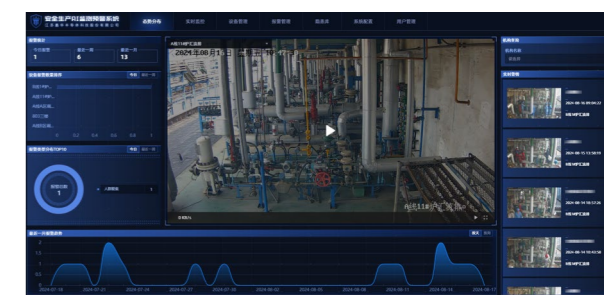
Strengthen standardized management;

Use thermal imaging technology

Convert the infrared thermal radiation of the cable into a visual thermal image, clearly display the hot spot distribution of the cable, and identify potential problem points.

Use ultrasonic thickness gauge and intelligent wall thickness detection equipment

Transmit continuous detection data to the DCS display terminal, and set alarm sound and light display to remind equipment personnel to take preventive measures in advance;



AI-based hazards analysis system



Emergency Management for Production Safety

All subsidiaries of GCL Group have formulated safety production emergency plans in accordance with the requirements, including comprehensive emergency plans, special emergency plans and on-site plans which have been filed with local functional departments to obtain filing numbers. According to seasonal characteristics, risks and hazards existing in the production site, targeted drills such as confined space, hazardous chemical leakage, typhoon and flood prevention, and fire emergency plans are organized to improve the emergency response capabilities of management personnel and front-line personnel.

Advocate Safety Culture

During the reporting period, GCL continuously improved the safety awareness and skills of all employees by providing safety knowledge training to different groups, such as safety managers, new employees, and contractor operators, and organizing "Safe Production Month" and "Fire Protection Advocacy Month" activities. In 2023, the Group's safety training coverage was 100%.



The Group organized a themed activity for Safety Production Month Featured "Everyone Talks about Safety and Everyone Knows How To Prepare For Emergency"

The Group requires all units to stick to the theme of Safety Production Month, earnestly publicize and implement the CPC's and the national safety production policies, carry out in-depth special inspection and rectification actions for major accident hazards, strengthen safety publicity and emergency drills, and further elevate the safety management levels.

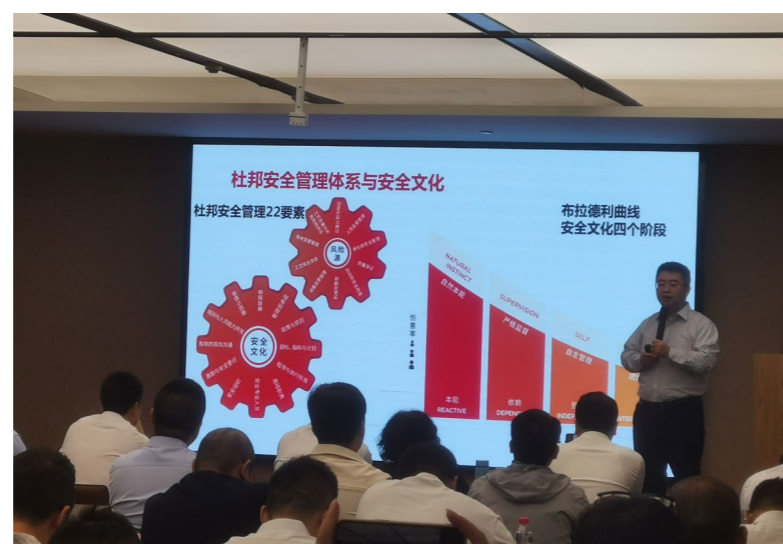


The Launching Ceremony of 2023 Safety Production Month



GCL Group organized the 2023 safety, health and environmental line training and invited experts to impart international advanced safety management concepts

In October 2023, GCL Group invited experts in hazardous chemicals safety guidance services and DSS+ safety consulting experts from key counties in China to provide a lecture about systematic special training on advanced safety management concepts, safety culture construction, and actual safety risk identification and analysis methods and techniques, team safety management, and safety experience sharing, drawing on leading experience and constantly raising the level of safety, health and environmental management.



The Group invited experts to provide lectures and educate on international advanced safety management concepts

Occupational Health and Safety

GCL strictly sticks to the requirements of applicable laws and regulations such as the Law of the People's Republic of China on the Prevention and Control of Occupational Diseases and the Regulations on Work-related Injury Insurance. We have formulated relevant management measures such as the Occupational Health Management Standard and established a sound occupational safety and health management system. By guiding and supervising our industrial sectors and subsidiaries to solidly promote various work related to occupational health and safety protection, we have created a healthy and safe working environment for employees. As of the end of the reporting period, 25 subsidiaries of the Group had passed the ISO 45001 occupational health and safety management system certification.

During the reporting period

Rate of employee physical examination coverage	Rate of employee occupational health and safety filing	Total person-time of participating in safety training throughout the year	Number of occupational disease cases
100%	100%	198,655	0

Main Measures for Occupational Health and Safety Management

Identification, Notification and Labelling Management of Occupational Hazardous Factors

- Place obvious safety signs and warning signs on equipment and facilities to remind employees to pay attention to occupational hazards;
- Conduct regular tests on occupational hazard factors to ensure that all factors meet national standards.

Implement Occupational Health Monitoring

- Set up a "Personal Occupational Health Supervision File" and conduct regular occupational health examinations;
- Continue to promote the orderly connection of multi-level medical insurance and strengthen employee medical insurance.

Improve Occupational Safety Awareness

- Provide three-level safety education and training for new employees, and regularly provide special training on labor protection, chemical use, mechanical injuries, electrical safety, etc.;
- Launch publicity week activities on the Occupational Disease Prevention and Control Law.

Prevent Risks of Occupational Hazards

- Provide employees with labor protection supplies, facilities and tools that are compatible with occupational health protection;
- Formulate preventive measures and adopt engineering control, ventilation and purification, noise reduction and other measures to reduce the risk of harm;
- Supervise the use of labor protection supplies and conduct regular inspections and updates.



Guangzhou Lantian carries out special training activities for paramedics

In September 2023, Guangzhou Lantian invited a registered lecturer from the Guangzhou Red Cross Society to provide a special training for first aid workers, including on-site cardiopulmonary resuscitation (CPR), AED on-site defibrillation, on-site first aid for common accidental injuries and emergencies, basic trauma first aid techniques, etc. A total of 22 trainees from various departments of the company participated in this training activity, all of whom passed the professional examination and successfully acquired the International Red Cross first aid certificate.

A vibrant, futuristic cityscape viewed through a large circular frame. The scene is dominated by a bright blue sky with fluffy white clouds. Several sleek, aerodynamic flying cars are seen in flight, leaving blue energy trails. In the foreground, a red sports car is driving on a curved, multi-lane road. The city features tall, modern skyscrapers and large, circular architectural structures that resemble portals or gates. The overall atmosphere is one of advanced technology and innovation.

Technology Innovation

Technology is GCL's "primary energy source." We are deeply committed to researching black technologies, building an innovative system that fuels team creativity through incentive mechanisms, and continuously reaching new technological heights. We rigorously protect our intellectual property, strategically positioning each innovation to forge the core advantages of the Group. Amidst the tides of change, GCL harnesses the power of technology to illuminate the path forward.



Technology Innovation

"Technology is the primary energy source. The endless pursuit of technological innovation is the foundation of a zero-carbon economy. Even during the critical period of our transformation and upgrading, GCL has never reduced its investment in science, technology and research. The technological content is defined by its green content."

—Zhu Gongshan

Achievements of Technology Innovation

Since its establishment 34 years ago, GCL Group has focused on silicon materials, lithium materials, carbon materials and core integrated circuit materials. By means of independent innovation in energy technology, we have created many world firsts or major innovative breakthroughs in cutting-edge technology fields, and promoted technology iteration, material substitution and model replacement in the industry.

<p>FBR Granular Silicon</p>	<ul style="list-style-type: none"> • More than 10 years of independent R&D, with complete independent IP rights; • Compared with rod silicon, the comprehensive power consumption is reduced by 77%, water consumption by 27%, labor cost by 57%, and hydrogen consumption by 57%; • Each kilogram of FBR granular silicon emits 37 kilograms of CO₂. FBR granular silicon has obtained dual carbon footprint certification from the French Energy and Environment Agency and the China Quality Certification Center, with the lowest carbon footprint for silicon materials in the world.
<p>Continuous Czochralski (CCz) Technology</p>	<ul style="list-style-type: none"> • The high fluidity of FBR granular silicon and high quality and efficiency of CCz are the upstream technology that perfectly matches n-type batteries, enabling the efficiency improvement and quality optimization of the photovoltaic industry chain; • The output of a single crystal pulling furnace has exceeded 185 kg/day, and a pilot production capacity of 200MW has been achieved.



<p>Perovskite Photovoltaic Modules</p>	<ul style="list-style-type: none"> • With high conversion efficiency, large size and excellent stability of its module products, GCL is leading the perovskite industry into the industrialization process of "high-large-stable" three-dimensional competition. • The 2m² single-junction perovskite module has a steady-state efficiency of 19.04%, and has obtained TÜV Rheinland IEC 61215 and IEC 61730 module safety and reliability certification; the 1.71m² stacked module has a steady-state efficiency of 26.36%; • The high compatibility of module-level stacking technology drives the common development of traditional crystalline silicon and new-generation photovoltaic technology; • Leading the industrialization process of perovskite technology, the world's first gigawatt-level perovskite stacked module project base is under construction.
<p>PVT Photovoltaic and Photothermal Integration Technology</p>	<ul style="list-style-type: none"> • Combine photovoltaics, photothermal and heat pumps, with photothermal and solar components complementing each other; • Perfectly integrate traditional photovoltaic modules and aluminum alloy blown molding panels; • Low energy consumption, high efficiency and energy saving, high safety performance and rich application scenarios.
<p>Electronic Grade Polysilicon</p>	<ul style="list-style-type: none"> • Undertake the "02 project" of the national major S&T; • 18 key impurity content level industry indicators have reached the industry's advanced level; • Construction of China's first 5,000-ton electronic-grade polysilicon production line (10,000 tons under construction); • The domestic market share exceeds 50%, and effective import substitution has been fully achieved.
<p>Semiconductor Large Silicon Wafer</p>	<ul style="list-style-type: none"> • Have a technical team capable of mass-producing 10nm silicon wafers; • Possess a complete supporting industrial chain and complete technical patents for semiconductor silicon wafer manufacturing; • The products cover 6-12 inch semiconductor-grade silicon wafers, power devices and other application areas.
<p>GCL-PHY Lithium Iron Phosphate Cathode Material</p>	<ul style="list-style-type: none"> • GCL's original physical production technology; • The process is reduced from 11 steps in the traditional chemical method to 4 steps; • The overall cost is reduced by nearly 50% compared with the traditional lithium iron phosphate process; • There is no wastewater, waste gas or waste residue in the whole process, and there is no need to settle in a chemical industrial park; • The project with an annual output of 120,000 tons of cathode materials has been put into production.



<p>Silicon Carbon Anode Material</p>	<ul style="list-style-type: none"> GCL's silicon-carbon anode material can replace graphite. It has high energy density, and can significantly improve the capacity and electrochemical performance of battery anode materials; The silicon-carbon anode material produced by GCL's nano-silicon material technology has a single product specific capacity of more than 1,500 mAh/g and an initial charge and discharge efficiency of 91%.
<p>AI Supercomputing Technology</p>	<ul style="list-style-type: none"> GCL Group has built the first energy AI supercomputing center in China, GCL AI Computing (Suzhou) Center. The center is planned to have a total computing power of 1,000P, or a computing speed of 100 quadrillion times per second.
<p>PV-Storage-Charging-Swapping Integrated Cloud Platform Technology</p>	<ul style="list-style-type: none"> Achieve frequency regulation in seconds; GCL's PV-Storage-Charging-Swapping Integrated Cloud Platform uses cloud computing, the Internet of Things, big data and other advanced technologies to integrate photovoltaic power generation, energy storage and battery swapping functions into a comprehensive platform. The platform covers the entire life cycle of people, vehicles and goods, making smart energy replenishment simpler and improving energy efficiency.

In 2023, GCL Group had

various scientific research projects carried out

377

National key R&D projects undertaken

8

GCL honored with

Jiangsu Provincial Enterprise Technology Center

Research projects

128

Provincial and municipal S&T projects

24

8 subsidiaries of the Group honored with

High-Tech Enterprise

Technical transformation projects

239

R&D expenses in operating income

3%

Xinhua Semiconductor honored with National Level

Specialized, Refined, Distinctive, and Innovative "Little Giant" Enterprise

New Generation Photovoltaic Technology - Perovskite

As a third-generation new solar energy technology, perovskite modules combine all the advantages of photovoltaic modules, especially the "perovskite + crystalline silicon" stacking design, which can further improve the photoelectric conversion efficiency. At the same time, the preparation process of perovskite modules is shorter and has lower energy consumption than traditional crystalline silicon modules, and has obvious cost advantages. Perovskite photovoltaic modules have more application scenarios than crystalline silicon modules due to their excellent properties such as lightweight, low thickness, bendability and translucency.

GCL is the founder of the commercialization of perovskite technology. We adhere to the industry's unique module-level perovskite stacking route, rather than laboratory-level perovskite cell-level technology R&D. We also pioneered a parallel solution that is compatible with all crystalline silicon routes, and jointly promoted the reduction of photovoltaic power generation costs with the crystalline silicon industry.

GCL firmly believes that only breakthroughs in core technologies can generate the expansion of the industry's ceiling and the improvement of the internal involution ecology. GCL Group has mastered the world's most advanced perovskite technology. In 2021, we built the world's first 100-megawatt perovskite pilot line, which has been in stable operation for more than three years. In 2023, GCL targeted commercial components for R&D and broke the world record for perovskite components one after another. At the same time, a 2GW-level large-scale perovskite production line was built in Kunshan, Jiangsu, which is committed to continuously improving the photoelectric conversion efficiency of perovskite components and reducing the cost of solar panels.

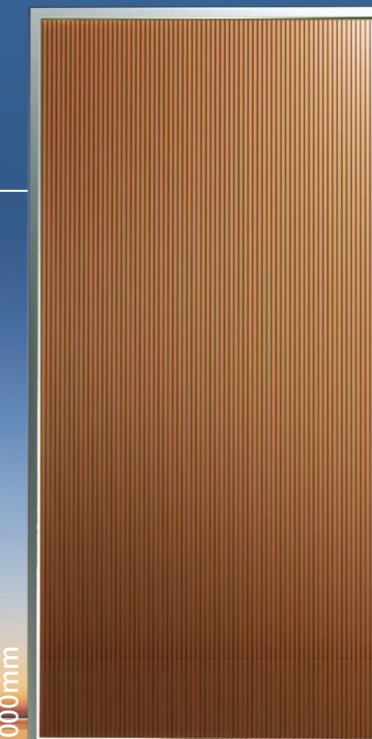
"Efficiency and size" are both improved, breaking world records successively

Perovskite Single Junction Module

November 23, 2023:

18.04%
@2m²(100cm x200cm)

1000mm



Perovskite Stacked Modules

November 30, 2023:

26.17%
@1,032cm² (27.9cm x37.0cm)

December 14, 2023:

26.34%
@2,048cm² (36.9cmx55.5cm)

2000mm

Ground-breaking for the World's First Commercial-scale (1.2m x 2.4m) Perovskite Stacked Module Gigawatt-level Production Base

On December 27, GCL Optoelectronic held the groundbreaking ceremony for the world's first gigawatt-level large-scale (2.4m×1.2m) perovskite production base in Kunshan Hi-Tech Zone, Suzhou City, Jiangsu Province, marking the official entry of GCL perovskite into a new era of gigawatt-level commercial operation. With full independent IP rights, the project has fully realized the localization of technology, equipment and materials. It represents the world's highest level of perovskite technology and commercial application, and is of great significance to the innovative development of the photovoltaic industry.



Project Site Plan

Energy Storage: the Ballast of New Power Systems

Energy storage is an important support for building a new energy system. GCL has successfully mastered a series of energy storage core technologies, including super-fast charging technology, large-scale energy storage single-phase liquid cooling technology, high specific energy cells, a new CTP integration process, active battery pack balancing technology, and energy storage high safety warning system. The energy storage system has high safety performance such as super energy level cycle, ultra-long design life, and three-level thermal barrier, leading the industry to achieve "energy storage parity" and "same life of photovoltaic and storage".

GCL released the "Xin" series of energy storage products

At the SNEC "Night of GCL" in 2023, GCL released the "Xin+" series of energy storage products, including "Xinyuan" LFP cathode materials for energy storage, "Xinchen" high-efficiency stacked short blade energy storage cells, "Xinwei" PACK, "Xinchen+", "Xinwei+", "Xinyu+" series of liquid-cooled energy storage integrated cabins, and "Xinhe+" series of liquid-cooled energy storage integrated cabinets. Of them, the capacity of the integrated cabin has been upgraded to the industry-leading 6MWh level.



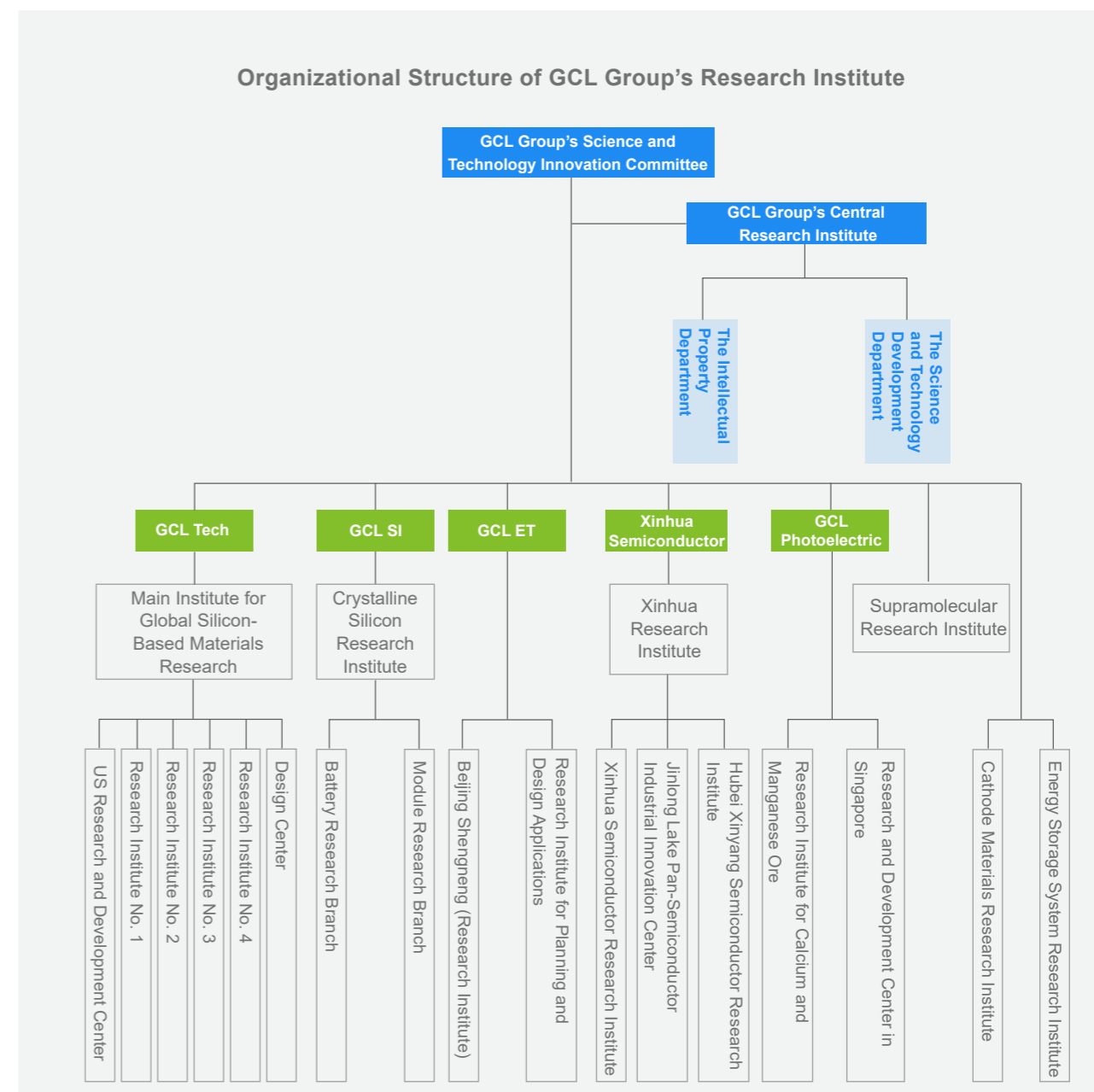
20-foot 3.72MWh+ liquid-cooled container energy storage system, equipped with 280Ah battery cells, using GCL's own electrode materials, with a maximum cycle life of up to 8,000 times.

Guaranteed by Technological Innovation

GCL Group insists on taking technological innovation as the primary driving force for business development. It has established a sound technology management system, introduced and cultivated S&T talents, continued to increase investment in technology R&D, anchored the forefront of S&T, and made every effort to promote the fission and development of the S&T field.

Innovative R&D System

GCL uses the Central Research Institute as a carrier of S&T innovation. It has established R&D centers in China based on the Yangtze River Delta, the Guangdong-Hong Kong-Macao Greater Bay Area, and industrial bases in the western region. It has also set up R&D centers in the United States, the Middle East, Japan and other overseas regions to build an innovative R&D system that integrates domestic and international collaborations.



GCL Group's Technology Innovation Committee	GCL Group's Central Research Institute	Main Research Institutes
As the highest decision-making body for S&T management of the Group, it coordinates the Group's S&T progress and innovation.	Mainly responsible for integrating the Group's scientific research resources, promoting the implementation of S&T strategies, improving digital platforms, strengthening IP management, raising scientific research funds, and paying attention to the latest technological trends at home and abroad.	Mainly responsible for the scientific research of special innovative R&D projects such as silicon-based materials, battery-level components, battery replacement technology, semiconductor materials, supramolecular technology, energy storage materials, and digital technology.

Research Team

GCL has a strong and efficient scientific research team, which brings together a think tank of 100 experts headed by 10 academicians of the Chinese Academy of Sciences and the Chinese Academy of Engineering, supplemented by over 3,000 outstanding R&D personnel from home and abroad, including of 20 S&T innovation teams and leaders.

10 academicians from the Chinese Academy of Sciences and the Chinese Academy of Engineering leading the think tank composed of 100 external experts

10 academicians

S&T Innovation Team

20

Excellent R&D personnel at home and abroad

More than 3,000

Intellectual Property Protection

Protecting intellectual property means safeguarding innovation. GCL Group has formulated internal policies such as the Intellectual Property Management Standards, Intellectual Property Application Management Process, and the GCL Group's 14th Five-Year Plan Intellectual Property Strategic Action Plan, and established a leading group to comprehensively promote the intellectual property strategic plan. We also take a series of powerful measures to fully strengthen IP protection, such as arranging IP layout, serving IP protection for key projects, optimizing IP platform construction, and enhancing the awareness of IP protection among all employees.

Innovation Incentives

GCL builds incentives for S&T innovation and keeps optimizing it. During the reporting period, we revised the "Science and Technology Award Management System", further clarified the award standards and conditions, and realized the normalization and standardization of S&T award management; we also implemented the scientific research exemption system, established an "S&T partner" mechanism, and solved the worries of scientific researchers in medical care, housing, life, children's education and family care, so as to stimulate their innovative vitality.



GCL Group 2023 S&T Work Conference and Annual Awards Ceremony

GCL Group held the 2023 S&T Work Conference and Annual Awards Ceremony in January 2024. The event recognized 47 advanced individuals with outstanding performance in the field of S&T innovation, 30 outstanding an excellent invention patent holders, 22 excellent S&T project teams, and awarded 6 "Wu Baolu Awards" to encourage the enthusiasm of innovative S&T talents and ignite the innovation enthusiasm of more people.

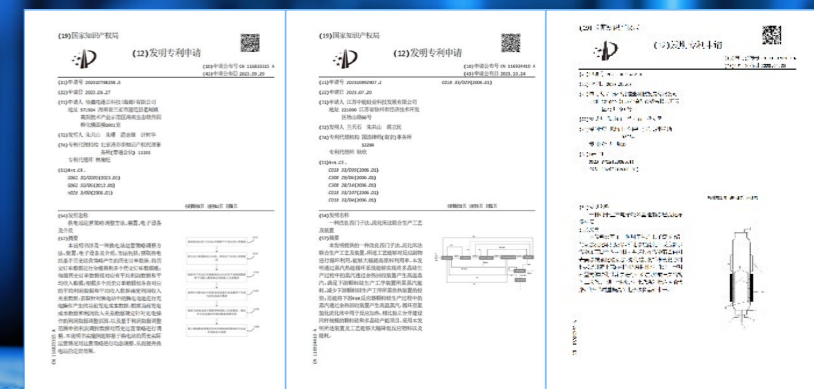


The Awarding Ceremony

Industry-University-Research Cooperation

In 2023, GCL Group achieved fruitful results in industry-university-research cooperation, and actively carried out 16 related cooperation projects with domestic and foreign research institutes and well-known universities. Together with Harbin Institute of Technology and other universities, it established the first supramolecular research institute in China; the perovskite team and Soochow University co-established a teaching and training base; the Singapore R&D center was also set up; GCL Group carried out technical cooperation with Central South University to jointly build a lithium battery recycling pilot line; in the photovoltaic field, GCL Group maintained close scientific research cooperation with Tianjin University of Technology, Hohai University and other universities to jointly promote technological progress; in the semiconductor field, the Group cooperated with Yangzhou University, China University of Mining and Technology and other universities to conduct in-depth big data research and technical cooperation, injecting new vitality into the development of the semiconductor industry.

GCL advocates the concept of "patent application is open to everyone" and makes patent application channels available for all employees to tap into their innovation potential and inject innovation and development momentum into the Group. In order to inspire "GCL people" to actively apply for patents, Zhu Gongshan, the Group chairman personally played a leading role and successfully applied for 3 invention patents in 2023.



Invention Title: Method, device, electronic equipment and strategy of battery swap station
Invention Title: A modified Siemens method and fluidized bed combined production process and device
Invention Title: A coated fluidized bed reactor for producing electronic grade polysilicon

Planning Intellectual Property (IP) Layout

During the reporting period, GCL Group conducted an in-depth analysis of the current status of its IP rights, completed a special analysis report on patents in key industries, and planned the IP layout of key industries in advance. The Group's Central Research Institute organized its subsidiary GCL SI to jointly launch a special overseas early warning analysis of BC batteries with the Suzhou Intellectual Property Protection Center. In addition, it also completed the patent risk investigation of battery cell projects to fully ensure the security of the Group's IP rights.

IP Protection for Key Projects

We have carried out IP protection work around key projects, established a set of professional processes from search to review, and applied them to key projects such as perovskite, field-based energy storage, mobile charging and storage vehicles, battery cells, and natural gas, to comprehensively improve the quantity and quality of the Group's IP. In 2023, the Group launched a project for the patent mining and layout of perovskite stacking, completed the proposed patent searching report and patent layout suggestions; in the Rudong natural gas project, we actively promoted IP protection work to ensure the smooth progress of the project.



Raising IP Awareness

In order to enhance employees' awareness of IP protection, we have completed extensive publicity, popularization and training on IP rights by releasing IP learning materials, holding IP publicity weeks, and reinforcing training via multi-department collaboration. During the reporting period, GCL Group launched IP-related learning materials based on the "GCL Sea of Knowledge" platform, among which the "Basic Knowledge of IP Rights" received over 10,000 hits.

Conducting IP-related knowledge training to enhance all employees' awareness of IP protection

In 2023, GCL Group's Supervision Center organized special training on IP rights in places including Leshan, Xinjiang, Baotou. Through case analysis and other methods, it systematically advocated and disseminated contents involving IP infringement to raise employees' awareness of IP protection.



Training site in Leshan in April

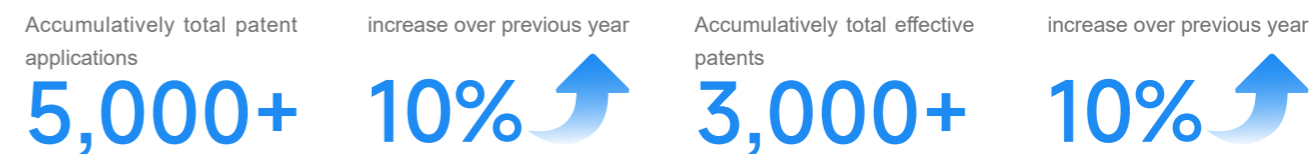


Training site in Baotou

Achievements in IP Protection

GCL remains committed to letting the journey reflect its progress and the accolades reflect its persistence. In 2023, the Group's patent applications hit a record high, with 626 patent applications, 260 invention patent applications, 453 authorized patents, and 91 invention patents authorized. By the end of the reporting period, the Group has filed accumulatively over 5,000 patent applications, with more than 3,000 valid patents. In 2023, the patent titled "A Method for Testing the Quality of Trichlorosilane, Purification Control Method, and Device" by Xinhua Semiconductor was awarded the China Patent Excellence Award.

By the End of the Reporting Period, GCL Group Has Filed



During the reporting period, GCL Group has added 29 international and industry standards, and has presided over or participated in the formulation/revision of 9 international and national technical standards, including "Determination of Minority Carrier Lifetime in Silicon and Germanium - Photoconductivity Decay Method" and "General Principles for Green Enterprise Evaluation". Among them, the new version of the national standard "Fluidized Bed Granular Silicon" led by GCL Tech has officially been released.

New Granular Silicon National Standard officially released

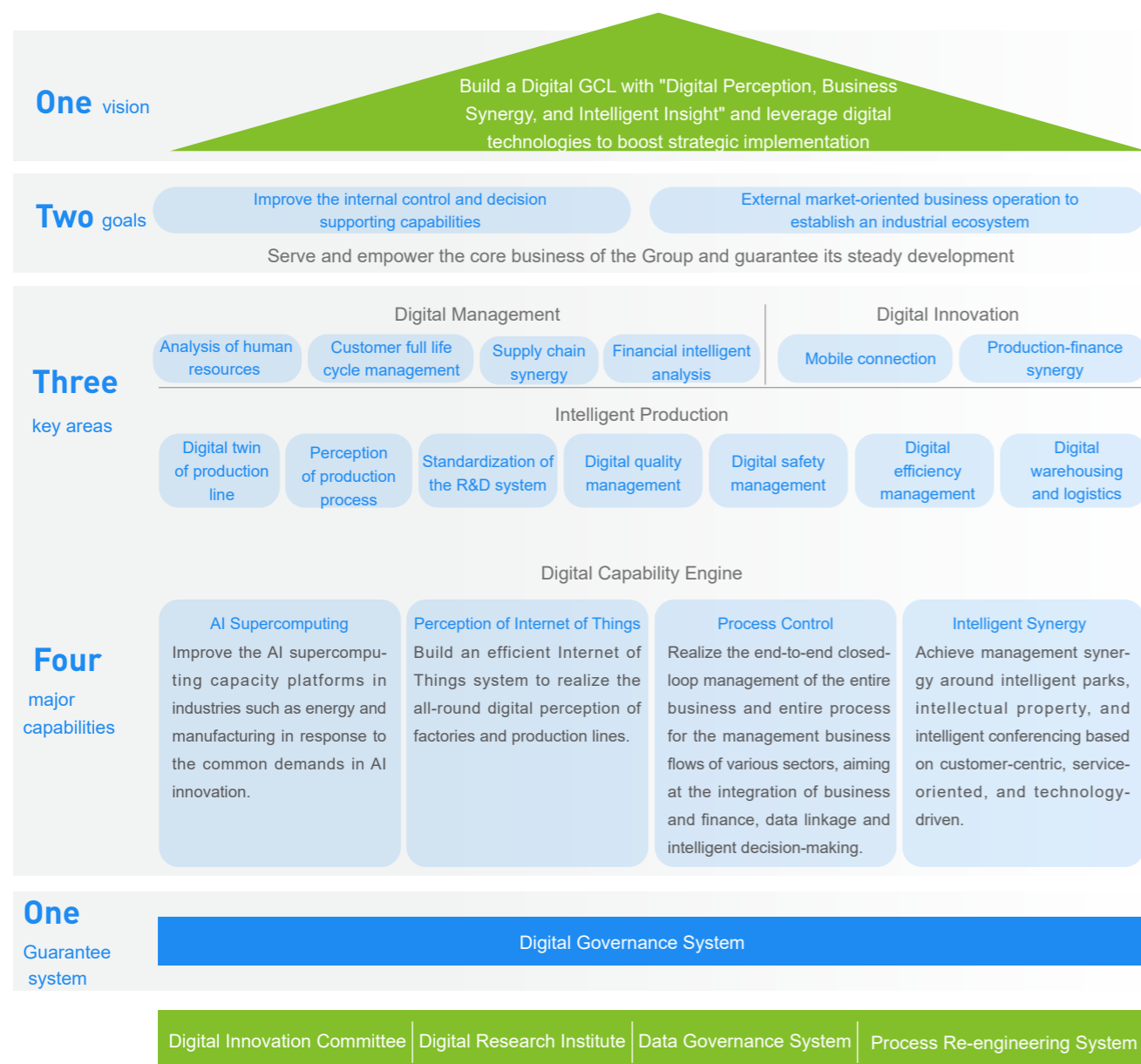
On August 6, 2023, the new national standard for "Fluidized Bed Granular Silicon" (GB/T 35307-2023), led by GCL Technology, a subsidiary of GCL Group, was officially released and would be implemented on March 1, 2024. This milestone signifies that GCL Technology's patent portfolio and technological advancements in the granular silicon field have provided a solid foundation for our competitiveness in the global photovoltaic industry, further promoting the standardization and internationalization process for granular silicon technology.

Digital Transformation

Digital transformation is the essential process for the development of energy companies. Guided by the "Digital GCL" strategy and the "Three Models and One Digital" theory, GCL Group follows the "three-step" path of digitalization and digital intelligence. By relying on informatization and using the opportunities of industrial upgrading and management reform, we accelerate digital transformation, and intelligent upgrading of the manufacturing industry, making digital the foundation of GCL.

Improve the Top-level Design of Digitalization

GCL Group has built a digital top-level design, guided by the vision of creating a digital GCL with "digital perception, business collaboration, and smart insight". We use digital technology to assist in strategic execution, which is guaranteed by a digital governance system. We strengthen the four major capabilities of AI supercomputing, IoT perception, process control, and smart collaboration as the digital engine, promoting digital management, intelligent production, and digital innovation, thus implementing the "Digital GCL" strategy to make decisions smarter, business more efficient, and users more convenient.



Digitalized Management

GCL is committed to demonstrating all business management behaviors with numbers, so that numbers can objectively and truly reflect the effectiveness of business management and reform, and serve an objective basis for assessing organizations and individuals. Based on this, GCL Group has orderly promoted the digital construction of various functions such as financial management, supply chain management, and recruitment management, deeply explored the value of digitalization, enabled enterprises to improve efficiency, and built new competitive advantages.

Business and Finance Integration

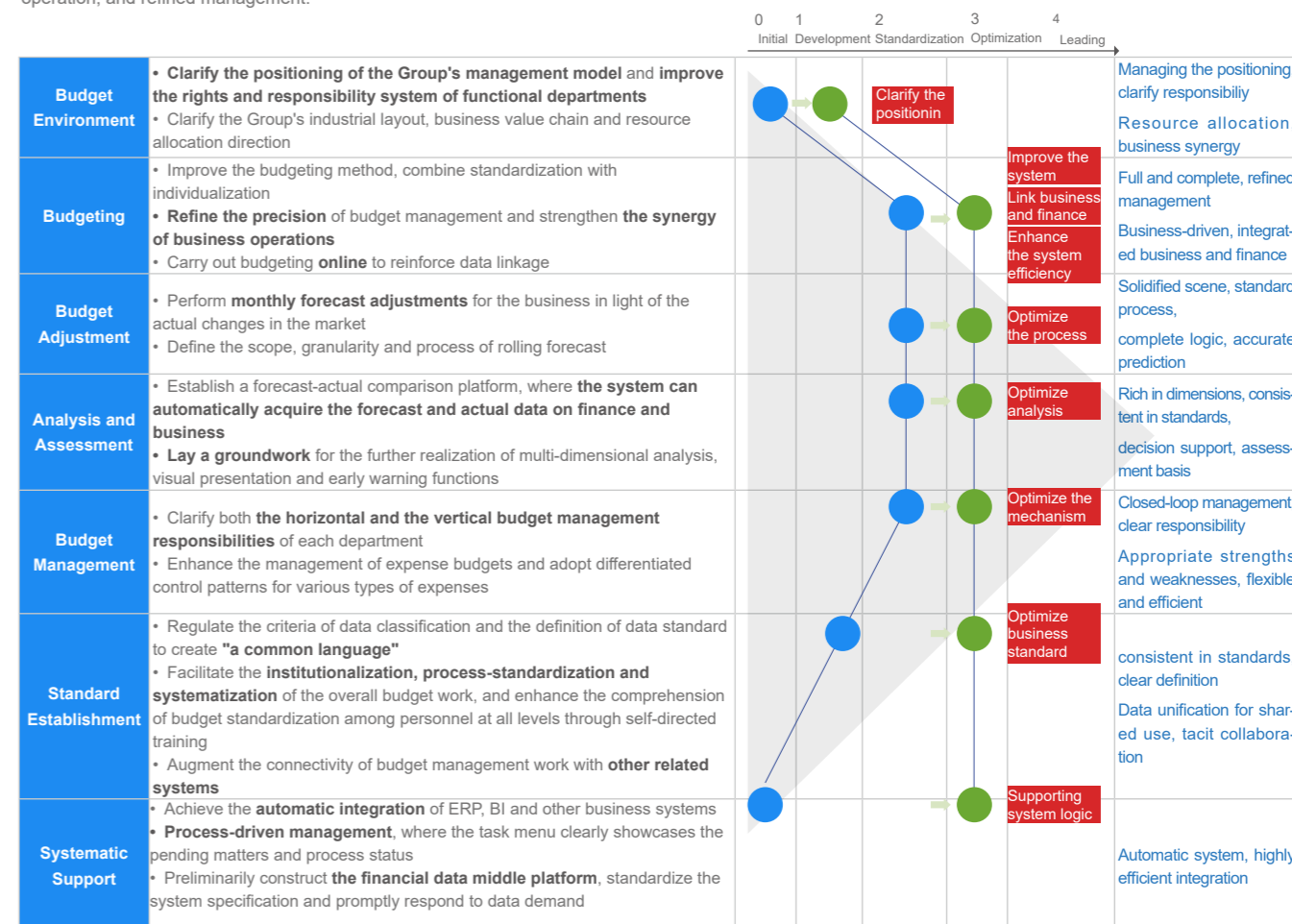
In the context of the digitalized intelligent era, GCL Group believes that financial digitalization can not only bring about functional changes, but also highlight value creation. After years of practice, GCL has built a "digital operation + smart finance + digital tax management + smart financial coordination" system, and achieved the management upgrade of "integration of business, finance, taxation and finance".

In terms of the integrated accounting system for business and finance, GCL has built a platform based on SAP ERP, including a fund management system, financial sharing platform, comprehensive budget management system, financial management report system, the Group tax management platform, the Group risk control platform and other modules; in terms of the financial basic data platform, GCL has two major parts: financial master data management platform and business and finance data management platform, as well as a large component of digital financial innovation (RPA, big data, AI) in the innovative application category. During the reporting period, GCL Group improved the efficiency of financial sharing by implementing projects such as bill split management, robotic process automation, intra-group reconciliation platform, and monthly settlement one-click inspection project; and launched the BPC consolidated report system optimization project and approval flow self-service query project to deepen the application of SAP system.



Building a comprehensive budget management system to strengthen the business department's ability to control business matters

Relying on the information system, we have established a comprehensive budget closed-loop management framework covering budget targets, budget preparation, budget control, budget analysis, budget adjustment, and budget assessment, which helps to achieve goals such as overall planning, efficient operation, and refined management.



"GCL Intelligent Chain"—Supply Chain Management Platform

GCL Group has created the "GCL Intelligent Chain" platform to build an integrated digital procurement platform in terms of supplier management, sourcing, e-commerce, and procurement collaboration. We have effectively promoted the reform of supply chain business management, effectively improved the level of refined management of suppliers, and achieved all-round, multi-angle, standardized, normalized, process-based and transparent supply chain procurement, improved supply chain operation efficiency and personnel efficiency, connected upstream and downstream enterprise systems, and built an energy industry ecosystem.

"GCL Talent Pool"—Digital Recruitment Platform

GCL Group has built a digital recruitment platform "GCL Talent Pool" to realize online recruitment and interviews, process assistance and supervision, data sharing and analysis, creating value for the group's talent development strategy in terms of efficiency, quality and control.

Online Management, Monitoring and Tracing of the Entire Recruitment Process	Enhance Data Sharing and Analysis	Recruitment Channel Management and Ecological Connection
<p>Improve work efficiency and talent screening efficiency</p> <p>Realize the management of the entire recruitment process including recruitment needs, job posting, resume screening, interview management, offer approval and issuance, and pre-employment</p> <p>Data visualization</p> <p>Multi-dimensional data analysis on recruitment progress, recruitment completion rate, recruitment efficiency, candidate quality, etc. can provide real-time feedback on the completion status of recruitment work.</p>	<p>Supporting human resources strategic decision-making</p> <p>Integrating recruitment, HCM, training, finance and other data on a digital analysis platform for comprehensive big data analysis;</p> <p>Activate talent pool resources</p> <p>Build a talent pool through classification, stratification, and decentralization. Label the talent pool and use AI and machine learning (ML) technologies to achieve job matching recommendations.</p>	<p>Unified management of recruitment channels</p> <p>Integrate social recruitment website channels, self-built recruitment websites, and headhunting channels to achieve unified management of recruitment channels; and analyze the conversion rate of recruitment channels to achieve rational allocation of recruitment resources;</p> <p>Recruitment ecosystem connection</p> <p>The recruitment system uses the assessment, background check and other ecosystem partner functions to output assessment and background check results, assist in decision-making on recruitment results, and reduce recruitment fault tolerance costs to a certain extent.</p>

"GCL Synergy" - Improving Overall Collaborative Efficiency

GCL Group has built "GCL Synergy", a mobile office platform covering all employees, which unifies full-time, live broadcast, telephone and other modes into Tencent Meeting, forming a combination of instant messaging, remote meetings, work calendars, application windows and multi-person collaboration and other applications to fully support daily collaborative work scenarios and improve the overall collaborative work efficiency of the group. In addition, based on the security guarantee of the Tencent Cloud Platform, it integrates zero-trust gateways, light and dark watermarks, real-name login, secondary authentication and other measures to further improve the security level.

"GCL Contract" - Assisting the Digital Transformation of Legal Affairs

In order to promote the digitalization and intelligence of contract management, GCL Group selected pilot units, addressed the pain points of contract management, and built a contract management system - "GCL Contract" to effectively connect various business systems related to the corporate main business activities, such as supply chain bidding, sales, procurement, payment, and performance. In this way, we realized full closed-loop control of online contract management, unified the approval platform, promoted electronic signing, effectively avoided the risks of online and offline contract differences, and improved contract data analysis capabilities and compliance.



Digital CPC Building

The CPC Committee of GCL Group actively responded to the call of the CPC Central Committee to build a "Digital China" and fully integrate into the construction of the Group's "Digital GCL". Through the construction and application of "one center and four platforms" (i.e., digital CPC building center, CPC building publicity portal platform, mobile CPC building platform, CPC member work platform, and party CPC organization work platform), GCL has realized "digital" functions such as informatization of CPC work, online organization of activities, and quantitative basic assessment, strengthened the coordination of CPC organizations, achieved the dual integration of CPC affairs and business, and built a new pattern of overall intelligent governance of CPC building.

After the implementation and release of the GCL Digital CPC Building Platform, it was fully affirmed by the organization department of Suzhou Industrial Park and received study visits of CPC organizations from many places in China. On June 30, 2023, GCL submitted 4 patent applications and 1 software copyright application. In August, the computer software copyright registration certificate was issued by the National Copyright Administration two design patent certificates were obtained in early 2024.



Computer Software Copyright Registration Certificate (August 2023)



Design patent certificate for the "Graphical user interface for enterprise information management on display screen panel" (2023)



Design patent certificate for the "Graphical user interface showing workflow on display screen panel"

Intelligent Production

GCL Group has consistently viewed intelligent manufacturing as a vital strategy to bolster the core competitiveness of the enterprise. By establishing digital workshops and intelligent factories, GCL Group has continuously enhanced production efficiency, reduced costs, and improved quality management.

Intelligent Manufacturing

GCL builds industry-based lighthouse factories to lead the Group's intelligent manufacturing construction. Focusing on the integration of industrialization and informatization, GCL promotes change through the construction of software systems such as MES, APS, WMS, and QMS, the automation of hardware equipment, and the combination of lean analysis. Since 2016, GCL has joined hands with Alibaba Cloud Computing to launch the "ET Industrial Brain", taking the lead in building a photovoltaic intelligent factory in the world, effectively promoting production efficiency and reducing labor costs, and greatly improving corporate competitiveness; and gradually promoting unmanned operation, sales and delivery collaboration platforms, and fully automatic intelligent stereoscopic warehouses in manufacturing bases to further deepen intelligent applications. As of the end of the reporting period, all core manufacturing bases of the four listed companies under GCL Group were "intelligent workshops", "intelligent factories", "intelligent manufacturing demonstration enterprises" and "national high-tech enterprises" at or above the provincial level.

During the reporting period, many companies under the GCL Group were selected as excellent national-level intelligent manufacturing scenarios in 2023.

Suzhou GCL — "Precise Delivery Scenario"

Based on the full 5G coverage of the enterprise factory, the application of 5G AGV trolleys, and high coordination with WMS and MES, the full-process precise delivery of multiple varieties of silicon rods/silicon wafers can be realized, which greatly improves the material transportation efficiency and precise delivery rate, and drives the efficiency of the entire production process.

Suzhou GCL — "Intelligent Online Detection"

For the properties of silicon wafers, the industrial camera device of the silicon wafer sorter is used for online visual inspection to detect whether the various properties of the silicon wafers meet the requirements. The system automatically collects the inspection data and promptly feeds back the results to realize the automation of product inspection. The implementation of this scenario has greatly improved the accuracy and efficiency of quality inspection, reduced the product defect rate, and decreased personnel costs.

GCL Lithium Battery — "Human-machine Collaborative Manufacturing"

The use of fully automated technology and automatic grinding technology can realize automatic kettle transfer and batch switching, upgrading from one person per machine in traditional equipment to only one person per six machines; the material flow of the entire production process is all transported by closed pipelines, without the need for manual supervision and manual transportation. The use of this scenario can greatly improve product quality.



Suzhou GCL successfully selected into the "5G Fully Connected Factory"

On November 20, Suzhou GCL's "5G Fully Connected Factory" project was selected for the "2023 5G Factory List". The project takes 5G+Industrial Internet as the entry point, deeply integrates 5G and other new-generation information technologies with enterprise business and information systems, promotes the deep integration of 5G network technology and traditional industries, and realizes the integration of all factors such as people, machines, materials, methods, environment, and measurement in the factory. It supports the application innovation of Suzhou GCL Photovoltaic's "5G Intelligent Cloud Factory" and promotes the digital transformation and upgrading of the company's 5G fully connected factory. Such move has played a strong role in promoting the healthy development of the company's business, production management and operations. After being put into use, the company's production efficiency has increased by more than 48%, the product development cycle has been shortened by more than 55%, and the profit growth rate has reached 76%. In 2023, it was selected as a national, provincial, and municipal 5G demonstration project many times, and continued to "lead" digital transformation.



Launching an unattended system to help build intelligent factories

Through unattended operation integrated with GCL Intelligent Chain, SAP, MES and other systems, GCL Group has completed the online automated management of the entire process of supplier order acceptance, vehicle dispatch, weighing, inspection, warehousing, settlement and other links, realizing the integrated management of procurement, logistics, warehousing, quality inspection and financial data, automatically collecting process data, reducing human intervention, improving the accuracy and real-time nature of data collection, and more effectively avoiding the occurrence of cheating; the successful launch of the project has reduced the vehicle entry time from 6 minutes/vehicle to 3 minutes/vehicle, and the weighing efficiency has increased by 100%; it has broken the information island and elevated the business communication efficiency by more than 10 times; with system replacing manual labor, the number of operating personnel has been reduced by 4, achieving a decrease in staff and increase in efficiency; the overall weighing room cost has been reduced by 60%.



Quality Management

"Enterprise in my heart, quality in my hands" is a core element of GCL's corporate culture. GCL's industrial sectors follow applicable quality and safety laws and regulations based on industry characteristics and process flows. By a variety of measures such as building a quality management system, strengthening digital quality, and conducting training, we create a corporate culture atmosphere of "quality for all employees" and constantly improve product quality.

	Main Quality Management Measures of GCL Group's Industrial Sectors	Product Quality Performance
GCL Tech	<p>Improve the Organizational Structure Formally set up a quality management center and build a quality management system with silicon wafer business as a pilot.</p> <p>Standardize System Management Standardize the requirements and norms for key links such as the admission of raw and supporting materials, production process, and finished product control, and realize the full life cycle management of product quality.</p> <p>Improve Product Quality Collect customer complaints, conduct market research to establish customer portraits, establish corresponding response measures around the three major aspects of performance, appearance, risk reduction and cost improvement, and summarize to form a quality standard system for internal segmented products.</p> <p>ISO 9001 Quality Management System Certification Except for 2 newly built bases in the year, the certification coverage rate reached 100% (a total of 13 bases).</p>	<p>The products with a total metal impurity content of five elements $\leq 1\text{ppbw}$ has overall stabilized at around 90%. At the same time, the products with a total metal impurity content of five elements $\leq 0.5\text{ppbw}$ has increased overall to about 75%, and some bases have approached 90%. This type of product can fully benchmark the market quality standards for N-type dense recycled materials.</p>
GCL SI	<p>Use Digital Technology for Quality Inspection Built an industry-leading fully automatic production line with an automation rate of up to 79.5%;</p> <p>High-level Photovoltaic Testing Center Passed the review of laboratories accredited by the China National Accreditation Service for Conformity Assessment (CNAS) and annual audits by international authoritative certification bodies such as TÜV (Rhine Germany) and CSA (Canadian Standards Association);</p> <p>Optimize the Quality Process Issued and implemented the "Identification and Traceability Control Procedure" and other regulations to improve quality management and traceability regulations; set up a unique certification QR code for each product for withdrawal of unqualified or unsafe products in a timely manner;</p> <p>Construct Quality Management System Hefei GCL, Funing GCL, and Xuzhou Xinyu obtained ISO 9001 quality management system certification; Funing GCL passed IEC 62941 photovoltaic module manufacturing quality management system certification.</p>	<p>During the reporting period, GCL SI did not suffer any product recall incidents;</p>

Xinhua Semiconductor

Improve the Quality Management System
Formulated internal audit, management review control procedures, risk and opportunity control procedures, etc., and improved the internal system framework; passed ISO 9001 and IATF 16949 system certification;

Quality Risk Identification and Management
Minimize the probability of risk occurrence by implementing process standardization, knowledge graph management, and sampling management during the testing process;

Strengthen the Supervision and Inspection Mechanism
Set up Xinhua Testing Center to conduct comprehensive monitoring of raw materials, products and processes; and cooperated with third-party testing companies to conduct random inspections on each batch of products;

Digital Quality Supervision
Use material tracking systems, profound applications of 5G industrial networks, SPC quality management systems, and LIMS laboratory management systems to monitor relevant indicators of the production process, conduct timely manual intervention, and eliminate unstable quality factors.

During the reporting period, Xinhua Semiconductor had no illegal or irregular incidents related to product quality, health and safety.

GCL Tech carried out self-inspection activities, with integrated quality management to empower the digital future

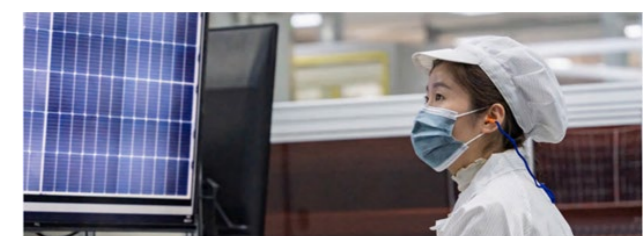
In 2023, GCL Tech, relying on its own industrial advantages, connected members of different bases in the upstream and downstream of the industrial chain, carried out self- and mutual inspection and correction mainly on wafer cutting, and conducted strict inspections around the effectiveness of standard documents, the standardization of on-site execution, and the timeliness of problem closure. During the inspection process, GCL Tech optimized documents and on-site records, discovered problems and continuously made them closer to the "site", so as to ensure the accuracy of the remote control command, and pave the way for the future promotion of digital management.



GCL Tech production base members carry out self-inspection activities

GCL SI uses AI judgment instead of manual inspection to improve production efficiency

It is highly efficient and accurate for AI to inspect products, which can optimize labor and reduce production costs. GCL SI attaches great importance to the application of AI technology in production. Line scanning AI is able to identify defects, which is expected to save 6 people per shift (based on 8 lines).



Line scanning AI used in the production line

Digitalized Operations

GCL Group actively promotes the integration of digital technology and industry, uses digital technology to improve efficiency, optimize service quality, and create new business models and growth points. Meanwhile, we also inject new impetus into the high-quality development of the industry and the construction of a new energy system.

Digital and Intelligent Operation and Maintenance Promotes High-quality Development of the New Energy Industry

GCL New Energy, a subsidiary of GCL Group, provides customers with comprehensive energy system solutions integrating "data + management" with its independent IP rights "GCLINKAGE" comprehensive energy management platform, which helps the high-quality development of the new energy industry. By the end of 2023, it served over 300 new energy projects with a total capacity of more than 10 million kilowatts, covering 27 provinces (municipalities and autonomous regions) in China.



"GCLINKAGE" comprehensive energy management platform

Virtual Power Plants Enhance Comprehensive Energy Service Capabilities

GCL, through the coordinated operation of virtual power plants, energy storage, and distributed photovoltaics, continues to enhance comprehensive energy services such as power distribution and electricity sales. Our subsidiary, GCL ET, operates a virtual power plant with a flexible load capacity of 300MW, whose responsive load accounted for over 23% of the total in Jiangsu Province throughout the year.



GCL Digital Energy Virtual Power Plant

PV-storage-charging integrated intelligent cloud platform

The integrated cloud platform of photovoltaic, storage, charging, and digital intelligence used by "GCL Charge" can not only realize big data site selection, intelligent operation and maintenance of stations, and monitor charging safety, but also perform comprehensive energy dispatch of photovoltaic, storage and charging and virtual power plants. The unique "on-demand allocation + intelligent upgrade" mode brings a better experience to users.



System and Information Security

As GCL Group continues to advance its digital transformation, network and information security serve as crucial foundations for ensuring the smooth operation of the enterprise. GCL Group continues to improve network security construction, organizational planning and internal control systems to holistically ensure the security of network use and achieve effective and controllable information data collection, protection and processing.



Overall Structure

The Group established a unified information security threat detection platform (situation awareness) to optimize and strengthen the protection of the Group headquarters and pilot project company's networks;

Improve the identification of security threats from a global perspective, make security events assessable, trends predictable, risks sensed, and execution controllable, and enhance the Group's information security protection capabilities.

Institutional System

Establish and implement systems and regulations related to information security and network security, including "Information Security Management Standards" and "Network System Management Standards".

Ensure that employees understand and comply with these regulations to reduce threats to safety caused by human factors.

Infrastructure for Information and Cyber Security

Ensure that the Group's information systems and network facilities have the necessary security performance and functions, including security firewalls, intrusion detection systems, vulnerability scanning systems, etc.

The Group can conduct regular security checks and vulnerability scans on a quarterly basis to promptly identify and fix security vulnerabilities.

During the reporting period, no major network security and information security incidents occurred in GCL Group.

United As One

GCL Group regards our employees as the core driving force behind the corporate development. We strictly adhere to national laws and regulations, fostering harmonious labore relations and paving the way for diverse career growth opportunities to ensure fair competition and empower every employee to reach their full potential. Additionally, we deeply care about the well-being of our employees, creating a supportive and sustainable workplace environment as we work together to build a brilliant future.



Protect Employees' Rights and Interests

Family culture is the emotional bond that unites all GCL people with the Group and with each other. It is a spiritual contract between GCL individuals and the corporate parent company to share both joy and hardship. This internal code enables GCL to continuously overcome crises, navigate cycles, and achieve transformation and upgrades.

—GCL Basic Principles (2023 Revised Edition)

After 34 years of development, GCL Group has inherited the essence of tradition and continued to grow. It has consistently adhered to the core principle of "family culture," prioritizing talent development. GCL has continuously optimized its human resources management system, safeguarded employees' legitimate rights and interests, enhanced a diversified training mechanism, broadened career development channels, focused on employee welfare, and created a healthy and safe working environment. With the "family" cultural atmosphere, GCL Group has envisioned a future of harmonious progress, mutual benefit, and win-win outcomes for both employees and the enterprise.

Protection of Labor Rights

We strictly adhere to the laws and regulations of the People's Republic of China, including the Labor Law, the Labor Contract Law, and the Regulations on the Prohibition of Child Labor. We practice legal employment, strictly prohibiting child labor and forced labor. We treat employees of all ages, genders, races, skin colors, religious beliefs, and cultural backgrounds fairly and impartially, firmly opposing discrimination, bullying, and other such behaviors. We recognize and respect that employees have various legal rights and interests, including the freedom to resign. The Group established the GCL Group Labor Union in 2016, adhering to the principle of "promoting corporate development and safeguarding employee rights." This union works to build and maintain a harmonious employment environment, ensuring that employee rights are fully respected and protected.

During the reporting period, the labor contract signing rate of GCL Group's employees reached

100%

Recruitment of Diverse Talents

During the reporting period, we continued to enhance our human resources management system and related regulations, revising documents such as the "Employee Recruitment and Employment Management System." Guided by the Group's strategy, business model, and internationalization goals, we focused on attracting elite talent both domestically and internationally. We introduced talents through various methods, including social recruitment, campus recruitment, school-enterprise cooperation, and management trainee programs. In 2023, we concentrated on attracting top talents in the industry. Through targeted searches and strategic recruitment efforts, we introduced nearly 100 employees at the senior director level and above, and amassed over 1,000 resumes of high-profile talents from both domestic and international sources.



School-enterprise Cooperation

GCL Group and Shenyang Institute of Engineering (SIE) jointly unveiled the "SIE Internship and Employment Base" & "GCL Group Talent Training Base".



2023 Global Campus Recruitment Project

The project was jointly planned and implemented by the Group and its various industrial sectors, and carried out in a combination of online and offline methods. 14,000 excellent resumes were received.



Management Trainee Project

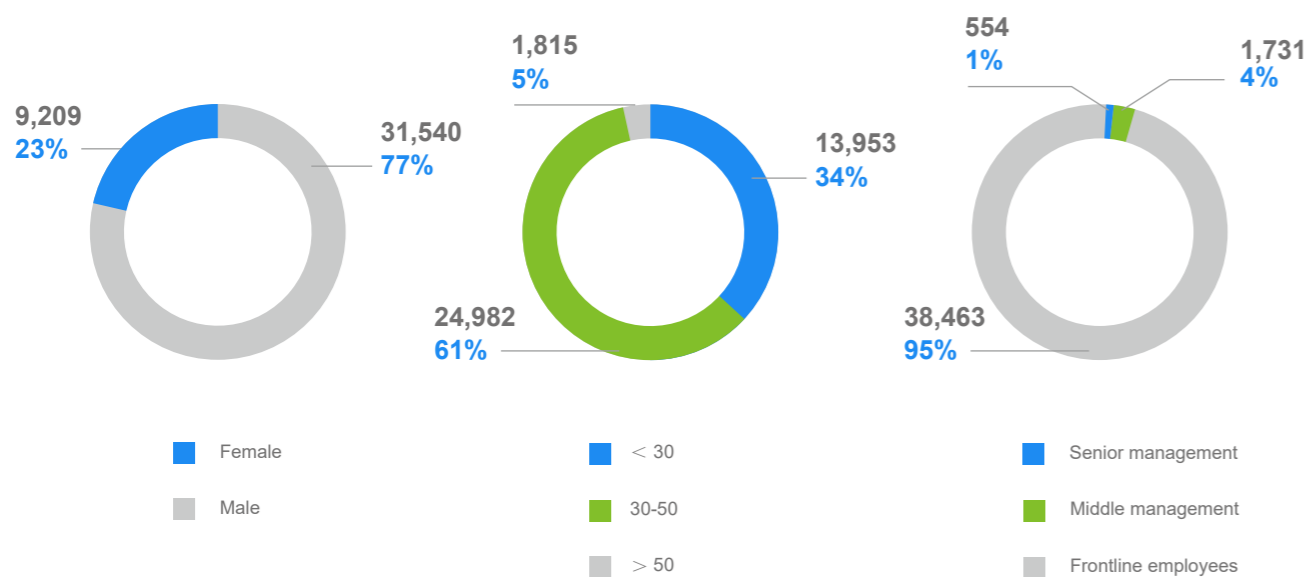
Mid-term defense of GCL Group's 2023 management trainees.

By the End of the Reporting Period

GCL Group had a total of **40,749** employees Including **3,645** from ethnic minorities

The Employee Distribution is as Follows (Unit: Persons, %) :

The number of employees by gender The number of employees by age group The number of employees by job level



Employee Compensation and Benefits

GCL Group views remuneration and benefits as crucial for attracting and retaining talent. We strictly adhere to the Labor Contract Law of the People's Republic of China and other relevant laws and regulations. To this end, we have formulated the Remuneration Management System and continually enhanced our comprehensive remuneration system, welfare programs, and diversified incentive policies. We are committed to sharing the fruits of our development with our employees by providing industry-competitive remuneration and benefits based on market conditions and job roles. Additionally, we flexibly adjust remuneration levels according to market conditions to ensure that GCL employees receive what they deserve.

During the reporting period, the social insurance coverage rate of employees reached

100%

Human Capital Development

GCL Group prioritizes employee development and talent empowerment. By building a mature training system, optimizing promotion mechanisms and channels, and establishing a comprehensive employee incentive policy, we enhance the professional quality of our employees and foster the common growth of both our staff and the enterprise.

Professional Development

To better expand the development space for employees and build a dual channel of Y-shaped career development, in 2023, the Group followed the guiding principles of "grading by position, hiring by ability, separating evaluation and hiring, and matching people with positions" and started the reform of the employee rank system. According to the type of position, four sequences are divided into M (management), P (professional), T (technical), and O (operation). Each sequence is divided into 12-13 levels. Each level sets clear standards and development paths around multiple dimensions such as professional and technical capabilities, skills, qualities, cultural values, age, education, and work experience, guiding the in-depth development of talents and providing employees with more abundant growth opportunities. In addition, in 2023, GCL Group carried out the reform to the job-title system and promoted the professional and technical capability level system. These initiatives aimed to help GCL employees deeply understand the core of the system reforms and to stimulate their enthusiasm and engagement.

During the Reporting Period, Job-title Reform Training was Provided in Many Places:



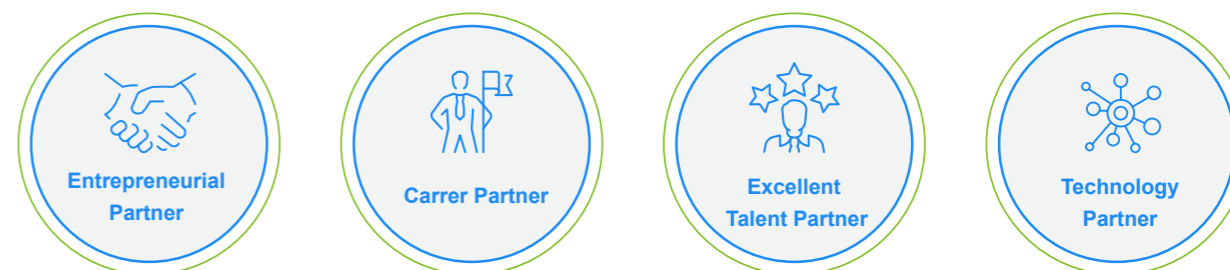
Inner Mongolia Xinhua Silicon Energy Technology Co., Ltd. organized job-title reform training



Training for Sichuan region was held at the Group's southwest headquarters.

To attract and retain key talents, enhance the company's competitiveness and achieve long-term stable development, GCL continues to promote the "Partner" plan¹⁷. Different types of partners are equipped with different types of medium- and long-term incentive plans, fostering a green business environment built on shared values and vision.

Classification of GCL Group's Partners



¹⁷The "Partner" system includes "Entrepreneurial Partner," "Career Partner," "Outstanding Talent Partner," and "Technology Partner." An employee can simultaneously be part of two or more partner categories and can also partner across different sectors and companies. The enterprise offers returns in the form of restricted stock, stock options, and virtual shares. This partnership mechanism fosters a culture of co-creation, shared responsibilities, mutual benefits, and common prosperity, enabling dedicated individuals to lead all GCL people towards shared prosperity.

Talent Fostering

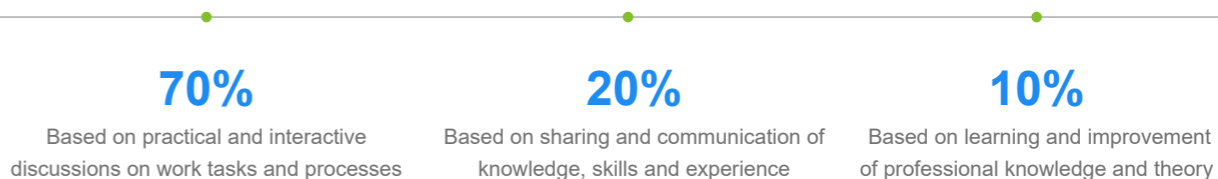
Talent is GCL's foremost resource. GCL continuously optimizes its talent training system, fosters an organizational learning culture, and encourages employees to pursue ongoing learning and improvement. This commitment ensures that both the company and its employees maintain a leading position in the industry.

Perfect Talent Fostering System

GCL focuses on the main channel of the industry, and creates a learning organization by strengthening the construction of the teaching organization network system, enriching the curriculum system, and innovating the training methods. This approach helps employees grow, enabling them to better adapt to changes and face challenges.

<p>Improve the Network System of Teaching Organization</p>	<ul style="list-style-type: none"> Form a three-level linkage of "GCL University-branch-base"; Plan the development of branch schools and branch institutes around industrial development and in different categories, and add digitalization school and digital energy school.
<p>Clarify the Direction of Talent Fostering</p>	<ul style="list-style-type: none"> Leadership Talent Fostering 167 trainees passed the leadership training assessment and defense; completed study of 60 courses including strategic leadership. Industrial Talent Fostering Jointly organized a reserve cadre fostering program with GCL ET, and jointly organized an ABC echelon class project for special fostering of successor cadres with GCL New Energy; and delivered 25 teaching sessions in various industrial bases; Professional Talent Fostering In 2023, GCL effectively carried out talent training and certification programs in various areas including finance, news communication, digitalization, and supply chain management, with over 500 participants receiving training.
<p>Enrich the Curriculum System</p>	<ul style="list-style-type: none"> Build GCL case library, course library and teaching material library to form a teaching method that conforms to GCL's reality and characteristics; By 2023, 217 new courses was developed, bringing the total number of courses to 1,865.
<p>Optimize Internal and External Teaching Staff</p>	<ul style="list-style-type: none"> Internal Instructors 101 new internal lecturers were added; the Internal Lecturer Management System was revised and a promotion, demotion and exit mechanism was set up; External Faculty Establish GCL think tank and introduce influential experts, scholars and outstanding young scholars in various fields.
<p>Promote Digital Transformation</p>	<ul style="list-style-type: none"> In 2023, the iterative update of the "GCL Sea of Knowledge" digital learning platform was launched, and each industrial can operate independently; advanced technologies such as AI and GhatGPT was integrated to build an all-encompassing learning organization.

GCL builds a "721" talent fostering model, emphasizing combination of theoretical learning with practice



Training program for new employees from on-campus recruitment - "New Employees On-boarding" training camp.

GCL University's Elite Class went to Peking University for intensive training.



In the contest by 2024 Xinhua News Agency's "Training" magazine, GCL's "Three Models and One Digital" Management Methods course won the "Excellent Course Award".



Education and Qualification Support

To systematically help employees clarify their learning goals, during the reporting period, we carried out school-enterprise cooperation projects to enhance employees' academic qualifications.. We have implemented a policy of "certification required for key positions" and initiated an independent professional qualification evaluation process, where our professional qualifications hold the same validity as the title certificates issued by government human resources and social security departments. These initiatives promoted the overall improvement of employees' academic qualifications and professional capabilities.

Enriching Talent Training Paths	Important Positions Require Certification	Independent Evaluation of Engineering and Technical Professional Qualifications
<p>Cooperate with the School of Business of Renmin University of China to launch master's degree programs, etc.; Work with Soochow University and Shanghai University of Electric Power to launch employee associate degree upgraded to bachelor's degree programs.</p>	<p>Standardize employees' job responsibilities through professional training, assessment and certification.</p>	<p>The pass rate for assistant engineer qualification review is 100%, and that for intermediate engineer qualification review is 83%.</p>

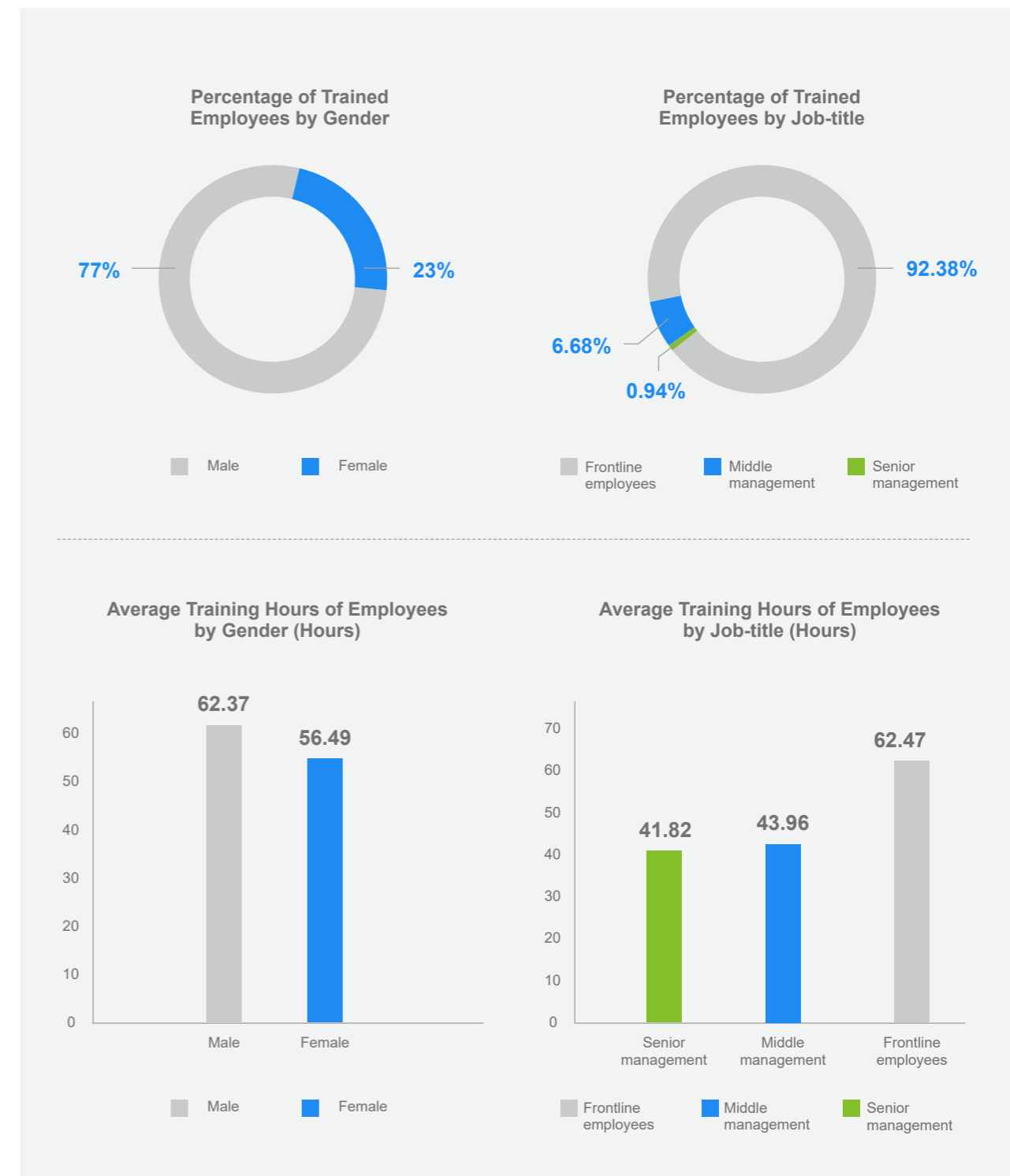


Certification training for GCL Intelligent Chain supplier's administrator

In December, GCL Group held the first GCL Intelligent Chain supplier administrator certification training event to help supplier managers from various units gain an in-depth understanding and master the application and maintenance skills of GCL Intelligent Chain platform, improve their professional quality and management capabilities, and work with certification to promote the digitalization of the Group's supply chain network.



During the reporting period, the total training hours for employees reached 1,477,577.54 hours, up 8.11% year-on-year; the average training time per person was 61.04 hours, up 14.95% year-on-year:¹⁸



¹⁸Scope of Statistics: GCL Group and its listed subsidiaries

Improve Employees' Well-being

GCL Group has consistently adhered to a "people-oriented" philosophy, valuing employee feedback and regularly organizing themed activities such as festivals and birthday parties. This approach fosters a diverse and inclusive work environment, continuously enhancing employees' sense of belonging, achievement, and happiness.



Employee Communication

GCL Group places great emphasis on democratic management and has actively established a three-tier employee representative conference system at the Group, industrial, and enterprise levels. In line with the GCL Basic Law, we have defined employee participation methods within decision-making, management, and coordination mechanisms. Furthermore, we have developed a combination of online and offline channels to widely gather employees' suggestions, opinions, and demands, thereby continuously enhancing their sense of participation and belonging.

Employee Communication Channels



GCL Group held its first employee representative conference in its new cycle.




Chairman Zhu Gongshan attended the Group's new employee symposium and discussed the future of GCL with them

Employee Care

GCL Group has always embraced the concept of "family culture," integrating employee care into both work and life. We offer a comfortable and welcoming work environment and foster a united and friendly atmosphere through initiatives such as employee support, assistance for those facing difficulties, and a variety of enriching activities.



Chairman Zhu Gongshan greeted GCL employees who stuck to their posts during the Spring Festival

 Providing practical care for employees



Helping employees in need: We have set up a special fund to care for GCL employees, and actively carried out the "One-Day Donation" campaign to help employees and their families who are in trouble due to illness or disaster.



The Group's "Sending Warmth to Gobi Desert Employees" project: The official unveiling and use of the Employee Activity Center of Xinjiang Guoxin Coal and Electricity Energy Co., Ltd. in December 2023




"GCL Summer Care Class": Won the honorary title of "Excellent Demonstration Site" in Jiangsu Province



Caring for female employees: During the International Women's Day, the Group's labor union organized female employees to visit the Nanxun Ancient Town



 We offer employees a variety of internal and external cultural and recreational activities



Corporate culture themed speech contest: "Get it right the first time"



The Group's labor union organized a theatrical performance titled "My Motherland and I" to express GCL employees' heartfelt blessings to the motherland



GCL Star United Team participated in the first Enterprise Basketball League in Jiangsu



International students from the Silk Road Institute of Renmin University of China visited Henan GCL and exchanged ideas on the Belt and Road culture with young GCL employees

Responsibility

GCL Group actively embraces social responsibility, adhering to a customer-centric philosophy. We continuously enhance the quality of our customer service through information-based solutions and complete management systems. Additionally, we are deeply committed to public welfare and charitable endeavors in various areas such as education support, environmental education and awareness, and volunteer activities, demonstrating our dedication to social responsibility and sustainability.



Improve Customer Service

GCL Group has always been customer-centric. All sector enterprises closely monitor product and service features, continually enhancing the customer service management system. We actively use customer feedback to drive ongoing optimization and iteration of our products and services.



Key Customer Service Initiatives

GCL New Energy

- Improve service efficiency through information technology such as the "GCLINKAGE" platform;
- New systems such as "Customer Complaint and Feedback Management", "Customer Satisfaction Survey and Evaluation Management", and "GCLINKAGE CRM Module Management Standards" were added to standardize customer service processes;
- Won the "PVBL 2023 Photovoltaic Industry Service Excellence Award".

GCL Tech

- Strengthen customer communication: Learn from the "e-commerce model" to innovate customer service mechanisms, and establish a process of "customer complaints - establishment of work orders - record distribution - responsibility determination - cause analysis - customer feedback" in 2023; achieve full-cycle and full-coverage customer communication; conduct satisfaction surveys regularly;
- Strengthen the statistical analysis of customer complaint data, organize regular customer complaint meetings, and track improvement progress;
- In 2023, GCL Tech's customer satisfaction rate increased to 96.85%, up 6.43% year-on-year.

GCL SI

- Improve the customer service system: formulate systems such as "Customer Request Control Procedure" and "Customer Complaint Management System" to standardize the process of handling customer complaints and opinions; establish a regular return visit system for the after-sales department and conduct closed-loop management of the return visit information;
- Adhere to the principles of honest management and responsible marketing, establish a product and service compliance review mechanism, regularly conduct employee compliance awareness training, ensure that product promotion materials are authentic and effectively communicated, comply with laws and regulations, and effectively protect customers' right to know;
- In 2023, the customer satisfaction survey scores of all GCL SI bases exceeded the target scores.



GCL SI Global Marketing Center provided training on responsible marketing, such as marketing contract legal affairs and sales business conduct norms, to the front-line sales team to enhance their compliance awareness.



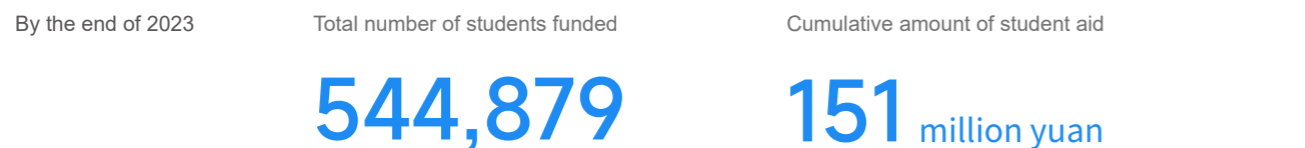
Engage in Public Welfare and Charity

GCL has always adhered to the concept of green development. While manufacturing green energy and exporting green solutions, we remain committed to social responsibilities and actively engage in public welfare and charity. Since the establishment of the GCL Sunshine Charity Foundation, the Group has carried out and participated in more than 100 public welfare projects across various fields, including environmental protection, poverty alleviation, orphan care, assistance to the disabled, education assistance, and disaster relief. As of the end of the reporting period, the external donations totalled over 300 million yuan.



Educational Support

GCL is always grateful and adheres to the principle of "wherever the industry goes, there is love!" This is especially evident in public welfare and charity projects dedicated to caring for the next generation. By focusing on supporting left-behind children, assisting children in difficult situations, improving school facilities in remote areas, and organizing children's summer camps, we aim to help local children grow up healthily.



The second phase of the "Children's Heart Harbor Provided by GCL" project to care for left-behind children in rural and pastoral areas was launched

Co-implemented by GCL Sunshine Charity Foundation and Baotou Youth League Committee, GCL donated another 500,000 yuan following the first donation of 200,000 yuan in September 2022. Since its launch, the hardware and software facilities of three schools in Baotou have been comprehensively upgraded, benefiting 569 students.



GCL Lithium Battery supports education in Renshou, Sichuan Province

On September 7, 2023, GCL Lithium Battery pledged one million yuan at the scholarship donation ceremony of the Renshou County Education Development Promotion Association of Sichuan Province. The pledged funds will be used to commend, reward, and assist outstanding students, outstanding teaching teams, and students from poor families in Renshou County, to encourage teachers and students to move forward.



GCL ET launched the "Hand in Hand, Heart to GCL" charity fundraising campaign

This activity has been held for seven consecutive years. Employees donated unused extracurricular books and educational toys to the children of Mangxiaoran Primary School in Shahe Township, Shuangjiang County, Lincang City, Yunnan Province, and donated teaching materials as a company to help the school improve its teaching conditions.



Popularization of Environmental Knowledge

Popularizing ecological and environmental knowledge helps to enhance public awareness of environmental protection, encourage green and low-carbon lifestyles, and collectively promote the construction of the beautiful China. GCL Future Energy Pavilion is a nationally popular science education base. Since its establishment, GCL Future Energy Pavilion has played a significant role in educating the public about the new energy industry and promoting low-carbon concepts. In 2023 alone, it hosted nearly a thousand groups of visitors, with over 12,000 people attending, including government agencies, enterprises, industry associations, and students from various levels across China. Additionally, GCL's subsidiaries have further enhanced environmental awareness by establishing environmental protection science and education demonstration sites, participation in local environmental initiatives, fostering a positive atmosphere where everyone cares about and participates in the construction of ecological civilization.



Xuzhou Regional Operation Center of GCL ET Clean Energy Company held a parent-child environmental protection science popularization activity titled "Striving to Be a Pioneer in Environmental Protection and Sharing a Green Life"



Taicang GCL held the event titled "Environmental Protection Facilities Public Open Day" to popularize environmental protection knowledge to citizens. Up to now, it has built 10 environmental protection science and education demonstration sites.

Volunteer Activities

We encourage and support employees to participate in various public welfare and volunteer services, promoting the regularization of volunteer activities through initiatives such as "Lei Feng Day" themed events, community assistance, blood donation, environmental protection, and other public welfare activities. In 2023, the Group organized approximately 120 employee volunteer activities, with a total participation of 10,078 person-times and a cumulative activity time of 20,108 hours.



Since Suzhou Lantian joined the "River Chief Alliance" in 2021, it has conscientiously fulfilled the duties of "corporate river chief", and specially formed a river patrol team to carry out the "clear river, protect banks, purify water, and conserve water" operations. In early 2024, it was thanked by the River Chief Office of Suzhou Industrial Park.



Jurong PV organized employees to carry out free blood donation activities.



Enhanced Cooperation

GCL Group is committed to building a stable, efficient, and resilient supply chain system. By means of optimizing management mechanisms, strengthening ESG risk identification and control, promoting responsible procurement and integrity in the supply chain, managing conflict minerals, and empowering suppliers, we aim to enhance the overall efficiency and sustainable development of our supply chain. Additionally, we are expanding our collaborative ecosystem to foster global exchanges and cooperation in the clean energy sector, collectively creating a green, diverse, intelligent, and shared world of clean energy.

17 PARTNERSHIPS
FOR THE GOALS

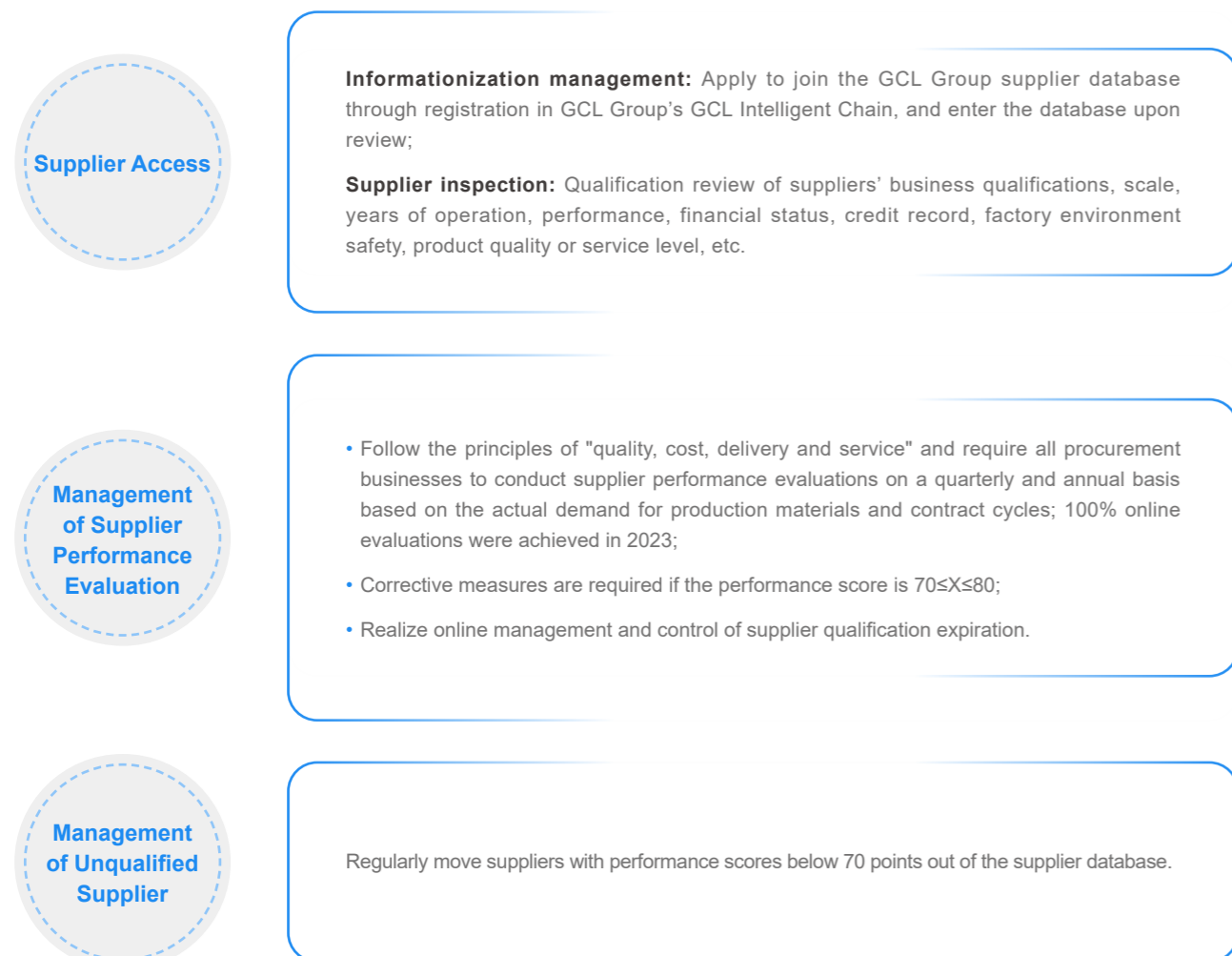


Supply Chain Collaborative Development

A stable, efficient, and resilient supply chain is crucial for corporate development. GCL Group continuously optimizes its supply chain management mechanism by building the "GCL Intelligent Chain" to enhance supply chain digitalization. We strengthen the identification and control of ESG risks within the supply chain and collaborate to create a transparent, win-win, and responsible supply chain.

Supplier Management

GCL Group has formulated and continuously improved the "Supply Chain Management System" and "Purchase Management System" and other systems to achieve full-process and standardized management of suppliers from aspects such as supplier access, tiered management, assessment, evaluation and exit. In addition, the Group and its subsidiaries have different focuses in supplier management. The Group proposes the principles, policies and goals of supplier management based on the development strategy; the subsidiaries are responsible for the evaluation of supplier selection, product acceptance and other aspects, and jointly implement the relevant requirements of supplier management.



By the end of 2023, the total number¹⁹ of qualified suppliers of GCL Group is

2,867

The number of suppliers by region is as follows:

Domestic	Suppliers	2,856
Suppliers in Hong Kong, Macao and Taiwan	Suppliers	3
Overseas Suppliers	Suppliers	8

¹⁹Scope of Statistics: Number of suppliers recorded on GCL Group's GCL Intelligent Chain platform

Build a Responsible Supply Chain

GCL Group attaches great importance to the identification and management of sustainable supply chain risks. We firmly implement responsible procurement, strengthen the construction of clean supply chain, and standardize the code of conduct for suppliers, and are committed to promoting the virtuous cycle and sustainability of the entire value chain.



Adhere to Responsible Procurement

We integrate potential ESG risks in the supply chain into the procurement process and provide necessary supervision and follow-up throughout the supplier's life cycle. In the "Procurement Management System" and other documents, we clearly give priority to products and services that meet environmental standards, such as high-efficiency energy-saving equipment, low-carbon emission technology, etc.; encourage suppliers to use high-quality and environmentally friendly raw and auxiliary materials to reduce environmental pollution; give priority to companies that have passed ISO 45001, ISO 14001 and other management system certifications, and require production and manufacturing suppliers to provide environmental management system certification certificates. In order to call on suppliers to jointly promote carbon reduction, we revised the relevant system during the reporting period and gave priority to suppliers that passed ISO 14067 carbon footprint product certification.

Standardize Supplier Conduct Manual

During the reporting period, relevant sector enterprises under the GCL Group formulated and issued the "Conduct Manual for Business Partners" or "Corporate Social Responsibility Manual for Suppliers", which set clear guidelines and requirements for supplier environmental management, occupational health and safety management, employment management and other matters, and jointly promoted the construction of a responsible supply chain.

By the end of 2023,

1,417

suppliers achieved certification for ISO 45001 occupational health and safety management system

1,488

suppliers achieved certification for ISO 14001 environmental management system

Building a Supply Chain with Integrity

To ensure transparency, fairness, justice, and efficiency in the procurement decision-making process, GCL Group has established a comprehensive sunshine procurement management mechanism. The GCL Intelligent Chain platform facilitates online and public procurement processes such as application, quotation, review, and contract signing, which allows for easy supervision and traceability of responsibilities. Additionally, a supply chain supervision system mechanism is in place, with the supervision center overseeing the supply chain bidding process. By rotating sensitive positions within the supply chain and enhancing training and education, the integrity awareness of relevant personnel is continuously improved.

Conflict Minerals Management

GCL requires its subsidiaries to establish and implement conflict-free mineral management policies and make relevant commitments not to purchase or use minerals and raw materials directly or indirectly from areas affected by armed conflict. When these materials (especially plating, tin, and copper) are needed for production, suppliers are required to track the source of minerals and provide a signed "Conflict-Free Minerals Declaration" along with supporting materials for the traceability results. For example, GCL SI has publicly issued a "Conflict Minerals Commitment" and requires all suppliers involved in conflict mineral risks to sign a "Conflict-Free Minerals Declaration".

Supplier Empowerment

GCL Group and its subsidiaries actively establish effective communication channels with suppliers, conduct quality training and exchanges, and expand innovative cooperation models to create a win-win cooperation ecosystem. During the reporting period, the GCL Intelligent Chain management and control platform was updated, and some production bases provided relevant guidance during supplier training to help suppliers adapt to the new functions of the online platform.



Jiangsu Zhongneng established a joint venture with its suppliers to achieve win-win through innovatively deepened cooperation

Jiangsu Zhongneng established a joint venture with an adsorbent supplier, utilizing a production method that deeply integrates industry, academia, and research to help suppliers enhance their R&D and production efforts. This innovative cooperation model has fostered an industry alliance with suppliers, connecting the rapid development of the supply chain with a shared, win-win mentality. In 2023, the joint venture developed catalyst products for Jiangsu Zhongneng that are more aligned with production needs, resulting in a 15% reduction in unit procurement costs.

In 2023, Jiangsu Zhongneng

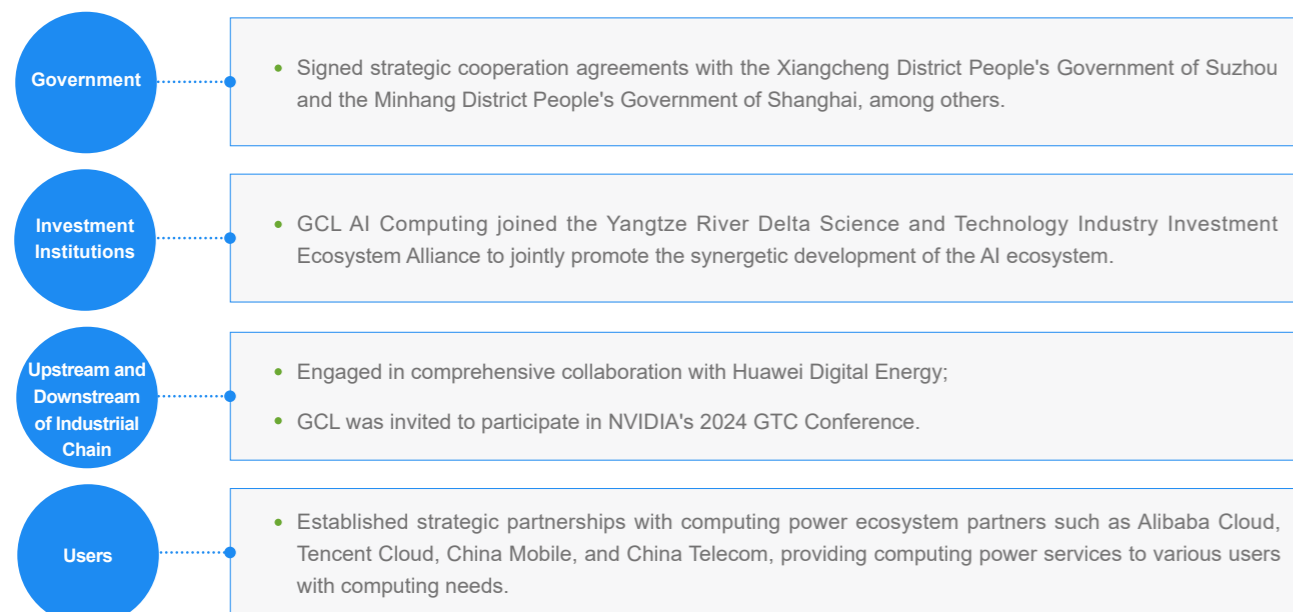
the unit procurement cost of catalyst product decreased by

15%

Clustered Chains to Realize Integrated Development

GCL Group has been actively leveraging our guiding role as a "chain leader", establishing intelligent manufacturing bases for polysilicon production, photovoltaic module manufacturing, and lithium battery production, thereby significantly driving the development of supporting enterprises in upstream and downstream industrial chain and supply chain. As new business models and approaches rapidly emerge in the new energy industry, GCL, with its forward-looking vision and leading influence, effectively connects diverse resources from enterprises and academic institutions, jointly advancing the penetration and accessibility of new energy and new technology applications. GCL is committed to strengthening communication and exchanges with different industries and regions, creating vast opportunities for win-win cooperation. Together, we aim to build a new world of green, diverse, intelligent, and shared clean energy, ensuring that green and clean energy benefits the entire globe.

Deepen Government-Enterprise Cooperation to Build a Computing Power Collaborative Ecosystem



Cooperation with Government and Enterprises:

GCL signed a strategic cooperation framework agreement with Huawei Digital Energy and the Zhengzhou Municipal Government to jointly build an integrated source-grid-load-storage dual system for photovoltaics, energy storage, charging, and computing power in Zhengzhou. This collaboration aims to support Zhengzhou in becoming a "City of Supercharging" and a "City of Computing Power."



Cooperation with Enterprises and Financial Institutions:

GCL Group signed a strategic cooperation agreement with Suzhou Transportation Investment Group and Jiangsu Bank to jointly establish the first demonstration city in China for integrated source-grid-load-storage, charging, swapping, and computing.

Enhance Domestic and International Exchanges to Expand Collaboration Opportunities



2023 International Forum on Energy Transition

Zhu Gongshan, Chairman of GCL Group, was invited to discuss international energy transition with energy leaders from 25 countries for building a global new energy system community.



2023 APEC China Business Leader Forum

Zhu Gongshan, Chairman of GCL Group, was invited to attend and deliver a keynote speech entitled "Revolution of Energy Technology Empowers a New Green Zero-Carbon Industry Ecosystem."



The 10th China-Arab Cooperation Forum Entrepreneurs Conference and the 8th Investment Seminar

In June 2023, Zhu Yufeng, President of GCL Group, was invited to attend the conference and participate in the thematic dialogue on "The Carbon Reduction Path of Clean Energy".

Robust Bank-Enterprise Relationships to Co-Create a Green Energy Future



Bank-Enterprise Cooperation Exchange Conference in GCL

In September 2023, the 2023 GCL Group Bank-Enterprise Cooperation Exchange Conference was successfully held. Representatives from banks, leasing companies and non-bank financial institutions from 29 cities of China attended the meeting to discuss a green future with GCL.

Appendix

Appendix I: Report Preparation Instructions

Overview

GCL (Group) Holdings Co., Ltd released its first "Social Responsibility Report" in 2013, updated it to the "Sustainability Development Report" in 2019, and further updated it to the "Environmental, Social and Governance Report" in 2021.

This report is the third "Environmental, Social, and Governance Report" released by GCL (Group) Holdings Co., Ltd. Adhering to the principles of objectivity, standardization, transparency, and comprehensiveness, this report provides a detailed disclosure of GCL Group's concepts, practices, and achievements in the areas of environment, society, and governance for the year 2023.

Preparation Basis

"The Guidelines for Writing Sustainability Reports" (GRI Standards) published by the Global Reporting Initiative (GRI)

The "Self-regulatory Guidelines for Listed Companies No. 17 - Sustainability Report (Trial)" issued by Shenzhen Stock Exchange

Appendix 27 to the Securities Listing Rules issued by the Hong Kong Stock Exchange Limited: "Environmental, Social and Governance Reporting Guide"

The International Standard on Sustainability Disclosures in Financial Reporting (ISFR) 1: General Requirements for Disclosures of Sustainability-Related Financial Information and the International Standard on Sustainability Disclosures in Financial Reporting 2: Climate-Related Disclosures issued by The International Sustainability Standards Board (ISSB).

Standards of the Sustainability Accounting Standards Board (SASB)

United Nations Sustainable Development Goals (SDGs)

Time Scope of the Report

The period covered by this report is from January 1, 2023 to December 31, 2023 (the "Reporting Period"). Certain information may extend beyond this scope to meet specific reporting requirements.

Entity Scope of the Report

The entities covered in this report are GCL (Group) Holdings Co., Ltd. and its subsidiaries. For ease of reading and description, "GCL (Group) Holdings Co., Ltd." is referred to as "GCL Group", "the Group" or "we". The abbreviations of the subsidiaries involved in the report are shown in the appendix. Environmental indicators cover four listed subsidiaries: GCL Tech, GCL SI, GCL New Energy, and GCL ET. Due to reasons like product categories and production processes, some data only pertain to specific subsidiaries.

Indicator Selection

This report mainly considers the quantification, significance, balance and consistency of specific indicators related to the performance disclosure of major topics.

Information Sources and Report Approval

The qualitative and quantitative information used in this report derive from GCL Group's public information, internal documents and relevant statistical data. The monetary amounts involved in the report are in RMB unless otherwise specified. This report was approved by the ESG Committee on August 28, 2024 after being confirmed by the management.

Access and Respond to This Report

This report is published online and can be viewed and downloaded from the GCL Group official website at <http://www.gcl-power.com>.

If you have any questions, suggestions or comments about our ESG management and this report, please contact us at:

Address: No. 28, Xinqing Road, Suzhou Industrial Park, Jiangsu Province (GCL Energy Center)

Tel: 86-512-6853 8285

Email: branding@gcl-power.com

Appendix II: GRI Indicators Index

Instruction	GCL Group reported in accordance with the GRI Standards for the period from January 1, 2023, to December 31, 2023.
GRI 1 Use	GRI 1: Foundation 2021

Disclosure No.	Disclosure Name	Chapter
GRI 2: General Disclosure 2021		
2-1	Organizational details	About GCL
2-2	Entities included in the organization's sustainability reporting	Report Preparation Instructions
2-3	Reporting period, frequency and contact point	Report Preparation Instructions
2-4	Restatements of information	No Restatements of information
2-5	External assurance	N/A
2-6	Activities, value chain and other business relationships	ESG Governance
2-7	Employees	Protect Employees' Rights and Interests
2-8	Workers who are not employees	Protect Employees' Rights and Interests
2-9	Governance structure and composition	Corporate Governance
2-10	Nomination and selection of the highest governance body	Corporate Governance
2-11	Chair of the highest governance body	Corporate Governance
2-12	Role of the highest governance body in overseeing the management of impacts	Corporate Governance
2-13	Delegation of responsibility for managing impacts	Corporate Governance
2-14	Role of the highest governance body in sustainability reporting	Corporate Governance
2-15	Conflicts of interest	-
2-16	Communication of critical concerns	ESG Governance
2-17	Collective knowledge of the highest governance body	ESG Governance
2-18	Evaluation of the performance of the highest governance body	ESG Governance
2-19	Remuneration policies	Protect Employees' Rights and Interests-Employees Compensation and Benefits
2-20	Process to determine remuneration	Protect Employees' Rights and Interests-Employees Compensation and Benefits
2-22	Statement on sustainable development strategy	Message from the President
2-23	Policy commitments	Business Ethics
2-24	Embedding policy commitments	Business Ethics
2-25	Processes to remediate negative impacts	Business Ethics
2-26	Mechanisms for seeking advice and raising concerns	Business Ethics
2-27	Compliance with laws and regulations	Risk and Internal Control and Management
2-28	Membership associations	About GCL-Profile of the Group
2-29	Approach to stakeholder engagement	ESG Governance-Stakeholder Communication

Disclosure No.	Disclosure Name	Chapter
GRI 3: Material Topics 2021		
3-1	Process to determine material topics	ESG Governance- Identification of Major Issues
3-2	List of material topics	ESG Governance- Identification of Major Issues
3-3	Management of material topics	ESG Governance- Identification of Major Issues
Economy		
GRI 201: Economic Performance		
201-2	Financial implications and other risks and opportunities due to climate change	Deepen the Green and Low-carbon Actions-Addressing Climate Change
201-3	Defined benefit plan obligations and other retirement plans	Protect Employees' Rights and Interests-Employees Compensation and Benefits
GRI 203: Indirect Economic Impacts		
203-1	Infrastructure investments and services supported	Technology Innovation- Results of Technology Innovation
203-2	Significant indirect economic impacts	Clustered Chains for Integrated Development
GRI 204: Procurement Practices		
3-3	Management of material topics	Supply Chain Collaborative Development
GRI 205: Anti-corruption		
3-3	Management of material topics	Business Ethics
205-1	Operations assessed for risks related to corruption	Business Ethics
205-2	Communication and training about anti-corruption policies and procedures	Business Ethics
205-3	Confirmed incidents of corruption and actions taken	Business Ethics
Environment		
GRI 301: Materials		
3-3	Management of material topics	Deepen the Green and Low-carbon Actions- Green Design and Green Manufacturing
301-3	Reclaimed products and their packaging materials	Deepen the Green and Low-carbon Actions- Green Design and Green Manufacturing
GRI 302: Energy		
3-3	Management of material topics	Deepen the Green and Low-carbon Actions-Energy Management
302-1	Energy consumption within the organization	Deepen the Green and Low-carbon Actions-Energy Management
302-2	Energy consumption outside of the organization	Deepen the Green and Low-carbon Actions-Energy Management
302-3	Energy intensity	Deepen the Green and Low-carbon Actions-Energy Management
302-4	Reduction of energy consumption	Deepen the Green and Low-carbon Actions-Energy Management
302-5	Reductions in energy requirements of products and services	Deepen the Green and Low-carbon Actions-Energy Management
GRI 303: Water and Effluents		
3-3	Management of material topics	Deepen the Green and Low-carbon Actions-Water Resources Management
303-1	Interactions with water as a shared resource	Deepen the Green and Low-carbon Actions-Water Resources Management
303-2	Management of water discharge-related impacts	Deepen the Green and Low-carbon Actions-Water Resources Management
303-3	Water withdrawal	Deepen the Green and Low-carbon Actions-Water Resources Management
303-4	Water discharge	Deepen the Green and Low-carbon Actions-Water Resources Management
303-5	Water consumption	Deepen the Green and Low-carbon Actions-Water Resources Management

Disclosure No.	Disclosure Name	Chapter
GRI 304: Biodiversity		
3-3	Management of material topics	Deepen the Green and Low-carbon Actions-Biodiversity Conservation
304-2	Significant impacts of activities, products and services on biodiversity	Deepen the Green and Low-carbon Actions-Biodiversity Conservation
GRI 305: Emissions		
3-3	Management of material topics	Deepen the Green and Low-carbon Actions-Addressing Climate Change
305-1	Direct (Scope 1) GHG emissions	Deepen the Green and Low-carbon Actions-Addressing Climate Change
305-2	Energy indirect (Scope 2) GHG emissions	Deepen the Green and Low-carbon Actions-Addressing Climate Change
305-3	Other indirect (Scope 3) GHG emissions	Deepen the Green and Low-carbon Actions-Addressing Climate Change
305-4	GHG emissions intensity	Deepen the Green and Low-carbon Actions-Addressing Climate Change
305-5	GHG emissions intensity	Deepen the Green and Low-carbon Actions-Energy Management
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	Deepen the Green and Low-carbon Actions-Emissions Management
GRI 306: Waste		
3-3	Management of material topics	Deepen the Green and Low-carbon Actions-Emissions Management
306-1	Waste generation and significant waste-related impacts	Deepen the Green and Low-carbon Actions-Emissions Management
306-2	Management of significant waste-related impacts	Deepen the Green and Low-carbon Actions-Emissions Management
306-3	Waste generated	Deepen the Green and Low-carbon Actions-Emissions Management
GRI 308: Supplier Environmental Assessment		
3-3	Management of material topics	Supply Chain Collaborative Development-Build a Responsible Supply Chain
308-1	New suppliers that were screened using environmental criteria	Supply Chain Collaborative Development-Build a Responsible Supply Chain
308-2	Negative environmental impacts in the supply chain and actions taken	Supply Chain Collaborative Development-Build a Responsible Supply Chain
Social		
GRI 401: Employment		
3-3	Management of material topics	Protect Employees' Rights and Interests-Introduction of Diverse Talents
401-1	New employee hires and employee turnover	Protect Employees' Rights and Interests-Introduction of Diverse Talents
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	Protect Employees' Rights and Interests-Introduction of Diverse Talents
GRI 403: Occupational Health and Safety		
3-3	Management of material topics	Safety Serves as Foundation-Occupational Health and Safety
403-1	Occupational health and safety management system	Safety Serves as Foundation-Occupational Health and Safety
403-2	Hazard identification, risk assessment, and incident investigation	Safety Serves as Foundation-Occupational Health and Safety
403-3	Occupational health services	Safety Serves as Foundation-Occupational Health and Safety
403-4	Worker participation, consultation, and communication on occupational health and safety	Safety Serves as Foundation-Occupational Health and Safety
403-5	Worker training on occupational health and safety	Safety Serves as Foundation-Occupational Health and Safety
403-6	Promotion of worker health	Safety Serves as Foundation-Occupational Health and Safety
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Safety Serves as Foundation-Occupational Health and Safety
403-8	Workers covered by an occupational health and safety management system	Safety Serves as Foundation-Occupational Health and Safety
403-9	Work-related injuries	Safety Serves as Foundation-Occupational Health and Safety
403-10	Work-related ill health	Safety Serves as Foundation-Occupational Health and Safety

Disclosure No.	Disclosure Name	Chapter
GRI 404: Training and Education		
3-3	Management of material topics	Human Capital Development
404-1	Average hours of training per year per employee	Human Capital Development- Talent Fostering
404-2	Programs for upgrading employee skills and transition assistance programs	Human Capital Development- Talent Fostering
404-3	Percentage of employees receiving regular performance and career development reviews	Human Capital Development- Talent Fostering
GRI 405: Diversity and Equal Opportunity		
3-3	Management of material topics	Protect Employees' Rights and Interests-Introduction of Diverse Talents
405-1	Diversity of governance bodies and employees	Protect Employees' Rights and Interests-Introduction of Diverse Talents
405-2	Ratio of basic salary and remuneration of women to men	Protect Employees' Rights and Interests-Introduction of Diverse Talents
GRI 406: Non-discrimination		
3-3	Management of material topics	Protect Employees' Rights and Interests-Protection of Labor Rights
406-1	Incidents of discrimination and corrective actions taken	Protect Employees' Rights and Interests-Protection of Labor Rights
GRI 408: Child Labor		
3-3	Management of material topics	Protect Employees' Rights and Interests-Protection of Labor Rights
408-1	Operations and suppliers at significant risk for incidents of child labor	Protect Employees' Rights and Interests-Protection of Labor Rights
GRI 409: Forced or Compulsory Labor		
3-3	Management of material topics	Protect Employees' Rights and Interests-Protection of Labor Rights
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	Protect Employees' Rights and Interests-Protection of Labor Rights
GRI 413: Local Communities		
3-3	Management of material topics	Engage in Public Welfare and Charity
413-1	Operations with local community engagement, impact assessments, and development programs	Engage in Public Welfare and Charity
GRI 414: Supplier Social Assessment		
3-3	Management of material topics	Supply Chain Collaborative Development-Build a Responsible Supply Chain
414-1	New suppliers that were screened using social criteria	Supply Chain Collaborative Development-Build a Responsible Supply Chain
414-2	Negative social impacts in the supply chain and actions taken	Supply Chain Collaborative Development-Build a Responsible Supply Chain
GRI 416: Customer Health and Safety		
3-3	Management of material topics	Improve Customer Service,Digital Innovation
416-1	Assessment of the health and safety impacts of product and service categories	Digital Innovation-Intelligent Production
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	Improve Customer Service
GRI 417: Marketing and Labeling		
3-3	Management of material topics	Improve Customer Service
417-1	Requirements for product and service information and labeling	Improve Customer Service
417-2	Incidents of non-compliance concerning product and service information and labeling	Improve Customer Service
GRI 418: Customer Privacy		
3-3	Management of material topics	Digital Innovation-System and Information Security
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	Digital Innovation-System and Information Security

Appendix III: Responding to the United Nations Sustainable Development Goals

Sustainable Development Goals	Description	Our Actions	Response Section
	End poverty in all its forms all over the world.	<ul style="list-style-type: none"> Upholding the principle of "where the industry goes, love follows," GCL funds underprivileged students through donations of funds and materials; Drive local economic development with our industry. 	<ul style="list-style-type: none"> Engage in Public Welfare and Charity Clustered Chains for Integrated Development
	Ensure healthy lives and promote well-being for all at all ages.	<ul style="list-style-type: none"> Create a warm and healthy work environment for employees and organize a variety of cultural and recreational activities; Strengthen safety production by establishing and improving an occupational health and safety management system. 	<ul style="list-style-type: none"> Employee Care Safety Serves as Foundation
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.	<ul style="list-style-type: none"> Relying on GCL University, we have built a comprehensive and rich talent training system to empower employees to grow; By implementing a series of public welfare education projects such as "Hand in Hand·Heart to GCL", "Children's Heart Harbor Provided by GCL ", etc., we ensure that local children have access to quality education. 	<ul style="list-style-type: none"> Talent Fostering Engage in Public Welfare and Charity
	Achieve gender equality and empower all women and girls.	<ul style="list-style-type: none"> Uphold gender equality and ensure equal pay for equal work for men and women; Protect women's rights and ensure that female employees have equal development opportunities. 	<ul style="list-style-type: none"> Protection of Labor Rights Employee Care
	Access to clean drinking water and water use for all is an essential component of the world we aspire to create.	<ul style="list-style-type: none"> Conduct water risk analysis and strengthen water resource management through measures such as water reuse, wastewater reuse, rainwater collection and reuse, industrial water cooling reuse, and water-saving technology transformation; Ensure ethe compliant discharge of wastewater. 	<ul style="list-style-type: none"> Water Risk Management
	Ensure access to affordable, reliable, sustainable and modern energy for all	<ul style="list-style-type: none"> GCL's FBR granular silicon and perovskite technology can effectively help reduce costs in the photovoltaic industry; Drive our transition from a clean energy producer to a comprehensive clean energy service provider; Expand the integration of clean energy with various scenarios such as transportation and construction, embedding it into new power systems. 	<ul style="list-style-type: none"> Technology Innovation Greener: Keep Optimizing Energy Structure Application of Zero Carbon Solution
	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	<ul style="list-style-type: none"> Build a comprehensive salary and benefits system and employee incentive policy to provide industry-competitive compensation and benefits; Advance rank system reforms to support employee career growth. 	<ul style="list-style-type: none"> Professional Development
	Build resilient infrastructure, promote inclusive and sustainable industry and foster innovation.	<ul style="list-style-type: none"> Adhere to the principle that "S&T are the primary energy source", continue to increase investment in R&D, and promote green and sustainability and lead technological innovation and iteration; Lead the world in the research and production of perovskite modules, consistently breaking world records for conversion efficiency. 	<ul style="list-style-type: none"> Technology Innovation
	Reduce inequality within and among countries.	<ul style="list-style-type: none"> Build an equal, diverse and inclusive employment environment to ensure equal opportunities; Promote the attraction of overseas elite talents based on the Group's strategy, business model and internationalization goals. 	<ul style="list-style-type: none"> Introduction of Diverse Talents

Sustainable Development Goals	Description	Our Actions	Response Section
	Make cities and human settlements inclusive, safe, resilient and sustainable.	<ul style="list-style-type: none"> Leverage the integrated advantages of "photovoltaic-storage-charging" to support low-carbon transitions across multiple industries, including construction and manufacturing; Launched the "GCL Charge" green commuting service brand, offering "one second per kilometer" ultra-fast charging services, which has been deployed in various service scenarios such as highways. 	<ul style="list-style-type: none"> Integration of Photovoltaic Generation, Energy Storage, Charging and Computing Application of Zero Carbon Solution
	Ensure sustainable consumption and production patterns	<ul style="list-style-type: none"> Enhance resource and energy use efficiency; prioritize the use of renewable energy; and build green factories; Adhere to responsible procurement, prioritizing suppliers certified with ISO 14001 Environmental Management System and ISO 14067 Carbon Footprint under equal conditions. 	<ul style="list-style-type: none"> Deepen the Green and Low-carbon Actions Supply Chain Collaborative Development
	Take urgent action to combat climate change and its impacts.	<ul style="list-style-type: none"> Improve the governance structure for addressing climate change, develop climate strategies, analyze and manage climate risks and opportunities, and track progress by setting indicators and targets. 	<ul style="list-style-type: none"> Addressing climate change
	Conserve and sustainably use the oceans, seas and marine resources for sustainability.	<ul style="list-style-type: none"> Strengthen the management of pollutants and emissions to ensure that emissions meet standards. 	<ul style="list-style-type: none"> Emissions Management
	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainable forest management, combat desertification, halt and reverse land degradation, and curb biodiversity loss.	<ul style="list-style-type: none"> Incorporate biodiversity conservation into the entire process of project planning and design, project construction, and operation management. 	<ul style="list-style-type: none"> Biodiversity Conservation
	Drive peaceful and inclusive societies for sustainability, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.	<ul style="list-style-type: none"> Pursue an integrity corporate culture, set up a reporting and protection process, and strive to build a "clean GC". Establish a "major risk control" system, encompassing risk management, auditing, legal affairs, and supervision, to strictly control risks; Advocate democratic management and build diversified and smooth employee communication channels and feedback mechanisms. 	<ul style="list-style-type: none"> Risk and Internal Control and Management Business Ethics Improve Employees' Well-being
	Reinforce the means of execution and revitalize the Global Partnership for Sustainability.	<ul style="list-style-type: none"> Build a communication platform for stakeholders and strive to establish transparent and responsible sustainability partnerships with multiple parties; Proactively participate in and promote industry exchange meetings, advocate complementary advantages, industry co-construction, and work together with the industry for common development. 	<ul style="list-style-type: none"> Enhanced Cooperation

Appendix IV: Names of companies covered in the report

Names Of Companies	Abbreviation
GCL (Group) Holdings Co., Ltd.	GCL Group
GCL Technology Holdings Limited	GCL Tech
GCL Energy Technology Holdings Limited	GCL ET
GCL System Integration Technology Co., Ltd.	GCL SI
GCL New Energy Holdings Limited	GCL New Energy
Jiangsu Xinhua Semiconductor Materials Technology Co., Ltd	Xinhua Semiconductor
Jiangsu GCL Silicon Material Technology Development Co., Ltd	Xuzhou Photovoltaic
Xuzhou GCL Environmental Protection Energy Co., Ltd	Xuzhou GCL
Xuzhou Xinyu PV Technology Co., Ltd.	Xuzhou Xinyu
Xuzhou GCL Solar Energy Material Co., Ltd.	Xuzhou Solar Energy Material
GCL Huidong Liquefied Natural Gas Rudong Co., Ltd	GCL Huidong
Wuxi LantianGas Turbine Thermal Power Co., Ltd	Wuxi Lantian
Kunshan GCL LantianDistributed Energy Co., Ltd	Kunshan Lantian
Jiangsu Zhongneng Polysilicon Technology Development Co., Ltd.	Jiangsu Zhongneng
Suzhou GCL Photovoltaic Technology Co., Ltd	Suzhou GCL
Suzhou Industrial Park Lantian Gas Thermoelectric Co., Ltd	Suzhou Lantian
Jiaying GCL Environmental Protection Thermoelectric Co., Ltd.	Jiaying Thermoelectric

Names Of Companies	Abbreviation
Henan GCL Photovoltaic Technology Co., Ltd.	Henan GCL
Leshan GCL New Energy Technology Co., Ltd	Leshan GCL
Sichuan GCL Lithium Battery Technology Co., Ltd.	GCL Lithium Battery
Inner Mongolia Xinhua Silicon Energy Technology Co., Ltd.	Inner Mongolia Xinhua
Inner Mongolia Xinyuan Silicon Material Technology Co., Ltd.	Inner Mongolia Xinyuan
Funing GCL renewable Energy Power Generation Co., Ltd	Funing GCL
Suzhou Industrial Park Northern Gas Turbine Thermal Power Co., Ltd	Northern Gas Turbine
Gaozhou GCL Gas Distributed Energy Co., Ltd	Gaozhou Gas Turbine
Taichang GCL Waste Incineration Power Generation Co., Ltd	Taichang GCL
Lanxi GCL Environmental Protection Thermoelectricity Co., Ltd.	Lanxi Thermoelectricity
Guangzhou GCL Lantian Gas Thermoelectric Co., Ltd	Guangzhou Lantian