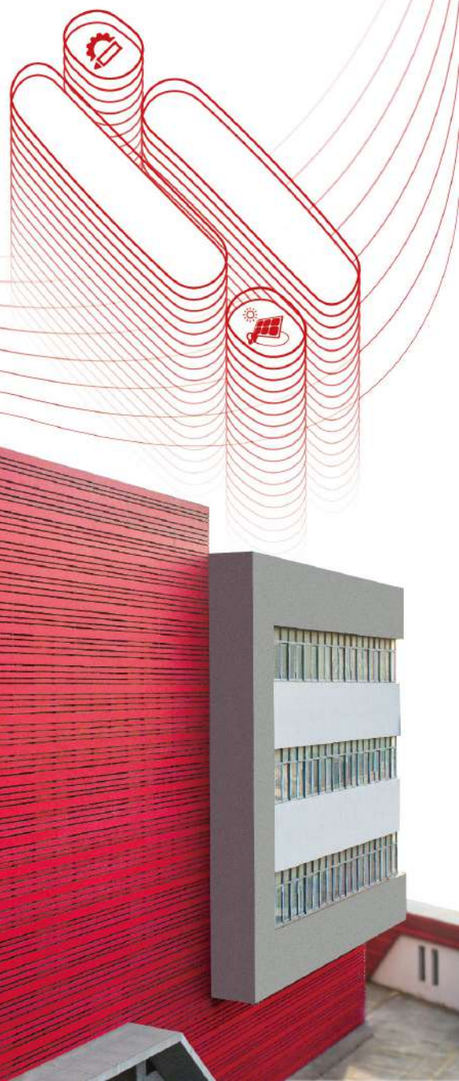
SHIFTING • THE FUTURE

SERAPHIM®

2023
Environmental, Social and Governance Report

Seraphim Energy Group Co., Ltd.



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About this report >>>

Reporting scope

This report is an annual ESG overview, highlighting the sustainability efforts and accomplishments of Seraphim from January 1, 2023, to December 31, 2023. In order to maintain continuity and comparability of reports between different years, some content may exceed the above time range. The organizational scope encompasses Seraphim's headquarters, along with its branches and subsidiaries.

Standard references

- Global Reporting Initiative (GRI) Standards
- IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures released by the International Sustainability Standards Board (ISSB)

Data source

The data is sourced from internal statistics and public reports. Unless otherwise specified, the monetary unit used in this report is the Chinese Yuan (CNY).

Terminology and abbreviations

In this report, "we", "group", "company", and "Seraphim" all refer to Seraphim Energy Group Co., Ltd. Please refer to the table below for the abbreviations of subsidiaries and branches of Seraphim Energy Group Co., Ltd mentioned in the report.

Full Names	Abbreviations
Jiangsu Seraphim Solar System Co. Ltd.	Seraphim Jiangsu
Anhui Seraphim Energy Co., Ltd.	Seraphim Anhui
Jinzhai Seraphim Energy Technology Co., Ltd.	Seraphim Jinzhai
Seraphim New Energy (Pty) Ltd.	Seraphim South Africa

Access to the report

This report is available in both paper and electronic versions, and is published in both Chinese and English languages. The electronic version of the report has been uploaded to Seraphim's official website. If you need a hard copy report, please contact the Sustainability Office for assistance.

Contact the Sustainability Office
Focal Point: Andrew Zhang
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Chairman statement >>>

Dear Seraphim Stakeholders,

In an era increasingly defined by climate change, our commitment to sustainable development is not just a choice; it is a responsibility that we are dedicated to fulfilling. As a global leader in photovoltaic manufacturing, Seraphim Energy Group is fully invested in driving the green energy transition. Alongside our global partners, we aim to create a more sustainable future. Our photovoltaic products are now utilized in over 100 countries, significantly advancing clean energy initiatives and underscoring our unwavering commitment to reducing our carbon footprint.

In 2023, Seraphim achieved remarkable milestones. Our global production capacity has soared to 12GW, and for the ninth consecutive year, we have been recognized as a Tier 1 module supplier by Bloomberg New Energy Finance. Additionally, PV Evolution Labs has honored us as a top module supplier on five occasions. These achievements reflect our relentless pursuit of quality, innovation, and responsibility to our customers, as well as our deep understanding of environmental protection and social responsibility.

As we progress on our sustainability journey, we encounter various challenges, including climate change, environmental protection, talent development, community engagement, and global supply chain management. We recognize that our actions carry significant consequences for both the environment and society, which drives our commitment to embedding sustainability in every facet of our business.

Climate action remains our top priority. We have set ambitious goals to achieve carbon peaking by 2030 and carbon neutrality by 2060, and we have already begun taking impactful steps toward these objectives. This includes optimizing production processes, promoting green office practices, upgrading production lines, and utilizing renewable energy sources. Our efforts extend beyond our company; we actively encourage our supply chain partners to engage in emission reduction initiatives, reinforcing our shared commitment to climate action.

In our environmental protection efforts, Seraphim employs scientific planning and energy conservation strategies aimed at maximizing resource efficiency and ecological preservation. We have implemented a water recycling system that effectively recovers and reuses cooling water generated during production, thereby minimizing wastewater discharge. Furthermore, we have adopted advanced exhaust gas treatment technologies to meet strict emission standards. Our commitment to sustainability also includes a significant increase in waste recycling, resulting in improved recycling rates compared to 2022.

At Seraphim, we recognize that our employees are our greatest asset. We are dedicated to fostering an open, transparent, and supportive communication environment, where we listen to our employees' voices, prioritize their well-being, and encourage their professional growth. Our comprehensive training and development programs not only enhance individual skill sets but also lay a strong foundation for the long-term success of our company.

In terms of community development, Seraphim actively embraces its social responsibilities. We are involved in building production bases and photovoltaic power station projects, which stimulate local economic growth, create job opportunities, and support vital public welfare initiatives. Our products also play a role in eco-friendly design projects, providing clean energy while protecting the ecological environment, thereby achieving a harmonious balance between economic development and environmental conservation.

Regarding product quality, we are committed to innovation-driven strategies that lead technological advancement, ensuring our customers receive high-quality products and services. Our management systems and digital strategies are designed to maintain the competitiveness and reliability of our products in the marketplace.

Finally, our approach to supply chain management embodies our commitment to sustainability. We have established strong cooperative relationships with our suppliers, collaborating to promote environmental protection and social responsibility while ensuring the stability and security of our supply chain.

As we move forward, Seraphim Energy Group will continue to work with all stakeholders to combat climate change, safeguard the environment, support community development, and contribute to global sustainable progress. Together, we can shape a brighter future and make the world a better place.

Sincerely,

Polaris Li

About Seraphim >>>

Corporate culture

Strategy

Shifting · The Future

Mission

Quality is the cornerstone of success. Seraphim's continuous innovation towards better quality products and new technologies allows us to share our success with our clients.

Vision

Shifting the future into a better world.

Core Values

Harmony, Pursuit of Excellence, Truth Seeking, Innovation

Business Philosophy

01 **We believe in the power of teamwork.** We fully leverage our team cohesion, strengthen communication and collaboration, enhance our teamwork skills, complement each other's strengths, build high-performance teams, and foster a positive team atmosphere.

02 **We are dedicated to ongoing innovation.** As a leader in technological advancement, we continually enhance our innovation initiatives, achieve breakthroughs in multiple areas of technology, promote a culture that supports innovation, prioritize talent development, and maintain robust core competitiveness.

03 **We aim for stable growth and sustained success.** In a constantly changing environment, we stay committed to our core business, embrace innovation, and enhance our internal drive.

Business model

Seraphim is committed to delivering efficient and high-quality products and solutions that truly meet our customers' needs. We have established a business model focused on the production of solar cells and photovoltaic modules while also offering power station solutions as a key complement. Our dedication to research and development, manufacturing, and customer service has allowed us to build lasting trust with our clients. Currently, we operate in over 25 countries around the globe, continuously striving to lead in product innovation and elevate our service offerings.

Input	123.97 million CNY R&D expenditure 16.2% of the employees in R&D 100+ patents with a 23.18% conversion rate 7+ Accredited Laboratories 14 Automated Production Lines An Online Platform For Real-Time Quality Monitoring
Solar Cell	210mm Half-cell 18BB TOPCon - Seraphim leads the future of N-type batteries.
Solar Module	Sable, Nebula, Hydra, Seco - Seraphim offers four series of photovoltaic modules: TOPCon, lightweight double-glass, HJT, and PERC.
Project Solutions	Ground power stations, industrial and commercial rooftops, household rooftops, and special applications - our solutions have made a mark in China, Europe, North America, Asia Pacific, the Middle East and Africa, and other regions.
Output	Profit increase 146.43 million CNY Market share increased by 3% 96.6% of customers have given Seraphim a satisfaction rating of 95 or above out of 100 points

Since its founding in 2011, Seraphim has quickly risen to become a leading name in global PV manufacturing. To date, Seraphim has achieved a global production capacity of 12 GW. We have earned Tier 1 distinction from Bloomberg New Energy Finance (BNEF) for 9 consecutive years and the Top Performer designation from PV Evolution Labs (PVEL) five times. With outstanding product quality, cutting-edge technology, and robust warranty programs, Seraphim's products are now widely used in diverse applications across more than 100 countries worldwide, as of the end of 2023..

TIER1
module supplier ranked by BNEF for 9 consecutive years

12GW
Global Production Capacity

100+
Technology Patents

100+
Destination Countries

80+
Global Financial Partners

4
times recognized as a top manufacturer by PVEL

Our products

Hydra HJT series

To meet diverse customer demands and adapt to different application scenarios such as G-mounted and industrial and commercial rooftop projects, Seraphim has newly developed the Hydra series HJT modules.

- Higher efficiency up to 23.18%
- Higher bifaciality (90%±5%)
- Excellent temperature coefficient (-0.258%/℃)
- Linear Annual Degradation⩽0.30%

Sable TOPCon series

After comprehensive consideration of production cost, yield, transportation, installation, system compatibility, and other optimization aspects, Seraphim launched Sable Series 182mm TOPCon modules. Implementing half-cell technology on 182mm wafer with multi-busbar technology & high-density packaging, increasing the module efficiency up to 22.54%.

- Significantly reduce BOS & LCOE
- 80%±5% Ultra-high bifaciality
- Lower attenuation, First year degradation⩽1%
- Better temperature coefficient: -0.29%/℃

Nebula Lightweight dual-glass series

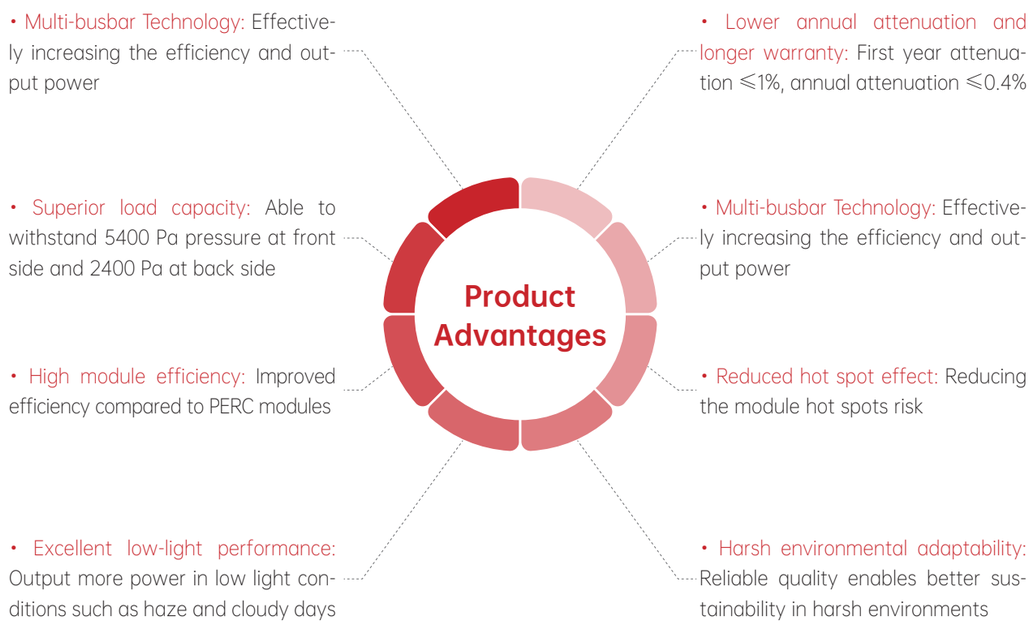
Based on 182mm silicon wafers, the Nebula lightweight dual-glass series module covers the power range between 400 - 460W. To meet the needs of different roofs, it adopts the 1.6mm+1.6mm dual-glass design. Integrate with the 28mm ultra-thin frame, it greatly reduces the weight and increases the efficiency.

- Full-black appearance, suitable for rooftop and other scenarios
- Excellent low-light performance and higher power generation capacity
- Lower attenuation, First year degradation ⩽ 1%
- Better temperature coefficient: -0.29%/℃

Seco PERC series

Tailored design for diverse rooftop & utility-scale solar installations, the Seco Series 182mm PERC Bifacial Module integrates 182mm silicon wafers of passivated emitter rear contact texturization technology alongside with bifacial technology, multi-busbar half cut technology, and high-density encapsulation enhances module's output power and conversion efficiency up to 21.46%.

- 670W high power output
- Module efficiency up to 21.57%
- Minimizes series resistance loss further improving performance of solar cell under partially shaded condition
- Reducing hotspot risk by ensuring uniform distribution of current across cell surface minimizing localized heating caused by high resistance
- Significantly reducing LCOE & BOS costs



History >>>

2011

- Jiangsu Seraphim Solar Systems Co., Ltd. established in China
- Received ISO 9001/ISO 14001/OHSAS 18001 Certificates
- Received the TÜV SÜD and TÜV Rheinland certifications
- German Branch set up
- Received MCS, CEC, CSA certificates

2012

- Passed JPEC certificates
- Built up a strategic partnership with Fujifilm
- Released DuraFlex™ module with mechanical load up to 8000Pa

2013

- Japan Branch set up
- Released Polaris™ and Solaris™ AC module
- Became the 1st to pass TÜV SÜD Thresher Test, 3 times stricter than IEC standards

2014

- Australia Branch set up
- Passed Japan JET Certification Tests

2015

- Global production capacity reached 1.5GW
- Global shipment exceeded 1GW
- Passed Brazil's INMETRO certification

2016

- Received the Witness Laboratory Accreditation Certificate (WMTC) authorized by CSA
- Received the TÜV SÜD TMP Laboratory Certificate
- Global capacity reached 2.1GW
- Global shipment exceeded 2GW
- Released high-efficiency mono shingled module
- Passed Three DNV GL Systematic Tests
- Passed the TÜV SÜD Dynamic Mechanical Load Tests

2017

- Released 158.75mm half-cell mono PERC cell module
- Reached Strategic Cooperation Agreement with CTC China Photovoltaic Product Test Center
- Received CNAS Laboratory Certification
- Global production capacity reached 3GW
- Global shipment exceeded 4GW

2018

- China's first 5MW PV power plant using high-efficiency mono shingled module commissioned
- World's largest projects using high-efficiency mono shingled modules and optimizer commissioned
- Released Mini high-efficiency mono shingled module
- Released P-type PERC bifacial module
- Received the TÜV SÜD CTF Laboratory Certificate
- South Africa Manufacturing Plant set up

2019

- Seraphim Lu'an Plant set up in China's Shanxi province
- Global capacity reached 5GW
- Released 158.75mm cell PERC Bifacial series module
- Released Planet PV energy storage system
- Recognized as 2019 Top Performer by PVEL

2020

- Released 166mm half-cut cell series modules
- Released 158.75mm series shingled modules
- Seraphim Yingshang Plant set up in China's Anhui province
- Recognized as 2020 Top Performer by PVEL
- Released 182mm MBB half-cut cell series module
- Global shipment exceeded 11GW

2021

- Seraphim Jinzhai Plant set up in China's Anhui province
- Recognized as 2021 Top Performer by PVEL
- Accredited as Qualified Laboratory by TÜV SÜD
- Received the world's first 2021 IEC61215 Series Standard Certificate by TÜV SÜD
- Accredited as the TMP Lab by TÜV Rheinland
- Global capacity reached 7.5GW
- Global shipment exceeded 14GW

2022

- Released 210mm cell series modules
- Released 166mm and 182mm cell lightweight dual-glass modules
- Recognized as 2022 Top Performer by PVEL
- Received the 2022 EcoVadis Silver Medal for Corporate Social Responsibility Achievement
- Global shipment exceeded 20GW

2023

- Global capacity reached 12GW
- Released new TOPCon series of solar PV modules globally
- Gained 'Low-Carbon' certification from CERTISOLIS
- Achieved BB-rating status in PV ModuleTech Bankability rankings
- Received the 2022 EcoVadis Silver Medal for Corporate Social Responsibility Achievement

Around the world >>>

◉ Sales Center ◉ Manufacturing Plant

China

Jinzhai Seraphim Energy Technology Co., Ltd.
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China

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China

Nanjing Sales & Marketing Center
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Email: info@seraphim-energy.com

China

Shanghai Sales Center
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Tel: +86-21-5230-0833
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Australia

Australian Sales Center
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South Africa

South Africa Manufacturing Plant
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China

Yunnan Seraphim Solar System Co., Ltd.
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Hong Kong, China

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Seraphim Solar Japan Co., Ltd.
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Tel: +81-03-6459-4020
Fax: +81-03-6722-0056
Email: info@seraphim-energy.com

Global Project References

Location: China/Gansu

Installed capacity: 375MW

Project Type: G-Mounted

Commission Date: 2023-6

Product: SRP-545BMA-BG

Location: China/Shanghai

Installed capacity: 3.16MW

Project Type: Fishery Hybrid PV Plant

Commission Date: 2023-8

Product: SRP-570-BTA-BG

Location: Lithuania

Installed capacity: 3.2MW

Project Type: Commercial Rooftop

Commission Date: 2023-7

Product: SRP-450-BMB-BG

Location: Kazakhstan/Shaulder

Installed capacity: 50MW

Project Type: G-Mounted

Commission Date: 2023-10

Product: SRP-535-BMA-HV

Travel of chasing the light

Time	Location	Exhibition
March 2023	United Arab Emirates, Dubai	Middle East Energy
March 2023	China, Beijing	Clean Energy Expo China
March 2023	Japan, Tokyo	PV EXPO
March 2023	China, Jinan	The 18th China (Jinan) International Solar Energy Utilization Conference and Comprehensive Energy Exhibition
March 2023	Netherlands, Amsterdam	Solar Solutions International
April 2023	Turkey, Istanbul	SOLAREX Istanbul
May 2023	Poland, Poznań	Green POWER International Renewable Energy Fair
May 2023	China, Shanghai	International Photovoltaic Power Generation and Smart Energy Conference & Exhibition
June 2023	United Kingdom, Birmingham	Installer SHOW
June 2023	Germany, Munich	Intersolar Europe
July 2023	China, Quanzhou	Fujian Distributed Solar Storage Development Forum
July 2023	Indonesia, Jakarta	INDOSOLAR EXPO
August 2023	Brazil, São Paulo	Intersolar South America
August 2023	Thailand, Bangkok	ASEAN SUSTAINABLE ENERGY WEEK
October 2023	Italy, Rome	ZeroEmission Mediterranean
October 2023	Australia, Melbourne	All-Energy Australia
November 2023	Turkey, Istanbul	EIF Turkey World Energy Congress and Expo
November 2023	Indonesia, Jakarta	ASEAN Photovoltaic and Energy Storage Exhibition
November 2023	Philippines, Manila	ASEAN CLEAN ENERGY WEEK
November 2023	Spain, Barcelona	PV Module Tech Europe

Seraphim in Munich, Germany

Seraphim in Shanghai, China

Seraphim in São Paulo, Brazil

Awards and honors >>>

Silver

Jiangsu Seraphim Solar System Co., Ltd.

EcoVadis

2023 Carbon Neutrality Green Brand Influence Co-construction Unit

Seraphim Energy Group Co., Ltd.

China Energy News, China Institute of Energy Economics

2023 Smart and Factory

Anhui Seraphim Energy Co., Ltd.

Anhui Provincial Department of Economy and Information Technology

2023 Outstanding Entrepreneur

Polaris LI, Chairman of Seraphim Energy Group Co., Ltd.

China Brand Boao Summit

2023 ESG New Benchmark Award

Seraphim Energy Group Co., Ltd.

The 7th Boao Enterprise Forum and 2023 Boao New Energy Forum

2023 Green Factory

Jiangsu Seraphim Solar System Co., Ltd.

Jiangsu Provincial Department of Industry and Information Technology

2023 Top 10 Influential People in the New Energy Industry

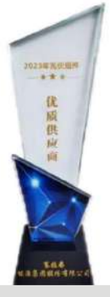
Polaris LI, Chairman of Seraphim Energy Group Co., Ltd.

China Brand Boao Summit

Charity Partner

Seraphim Energy Group Co., Ltd.

IHEARU Charity Foundation



2023 PV Module Premium Supplier

Seraphim Energy Group Co., Ltd.

2023 Shanghai Metals Market (SMM) Photo-voltaic Industry Summit.

2023 Green Factory

Anhui Seraphim Energy Co., Ltd.

Anhui Provincial Department of Economy and Information Technology

PV Module Tech Component Bankability BB Rating

Seraphim Energy Group Co., Ltd.

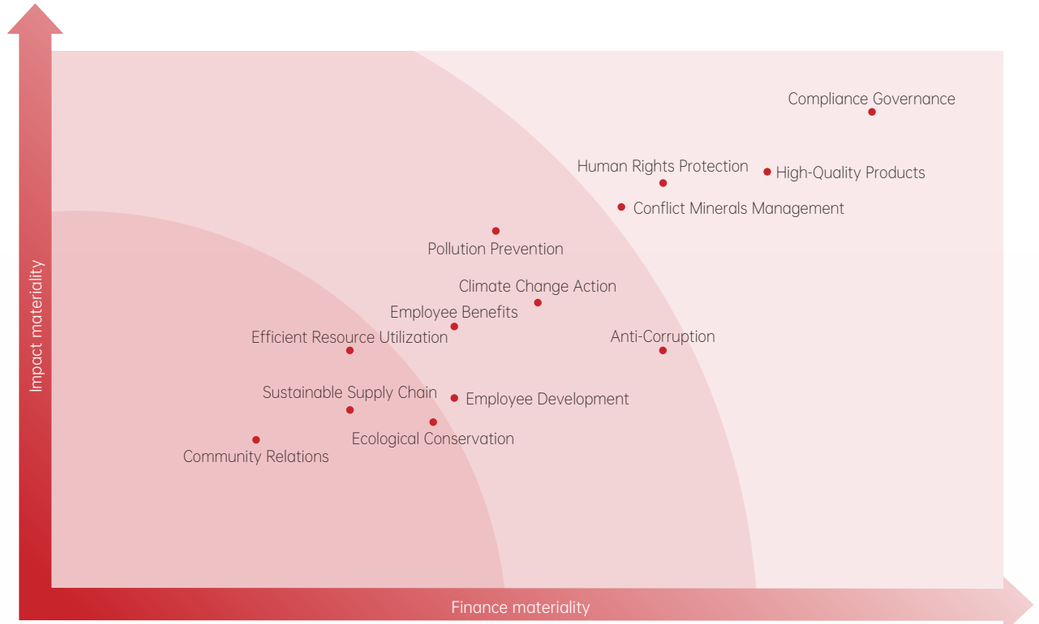
PV Module Tech

Assessment of Materials >>>

Conducting an assessment of materials is an effective way to accurately identify and deeply understand ESG issues that are of significant importance to stakeholders and business development. In 2023, Seraphim conducted an annual ESG substantive issue survey based on the dual important principles. Initially, the company organized core members of ESG management for internal discussions, preliminarily selecting Seraphim's substantive issues related to environmental, social, and governance aspects. When screening these issues, we comprehensively considered the current development landscape of the photovoltaic industry, future development expectations, the company's own operational status, and the latest global ESG trends.

Subsequently, we specifically invited a group of representatives from our internal and external stakeholders, including government officials, shareholders, customers, suppliers, employees, members from various industry organizations, media personnel, and members from social communities. Through questionnaires and one-on-one interviews, we gathered their views on the impact of materials used by the industry, in particular, Seraphim. These specifically invited representatives have a relatively deep understanding of Seraphim, with some members also being well-versed in ESG-related matters. The approach of targeted invitations rather than widespread questionnaire distribution helps us efficiently uncover the genuine demands of all parties, enhancing the reliability of the importance ranking of substantive issues.

In the following chapters, we will respond to these issues one by one, clearly presenting to the report readers the phased progress and achievements of Seraphim in ESG work.



Hightlights of ESG performance >>>

Environmental Investment

Total Environmental Investment **714.5** thousand CNY

- Greenhouse Gas Emissions

Scope 1
1,933 tCO_2e

Scope 2
27,578 tCO_2e

Total
29,511 tCO_2e

Water Consumption
182,469 tons

Hazardous Waste
6.51 tons

- Waste Recycling Rate

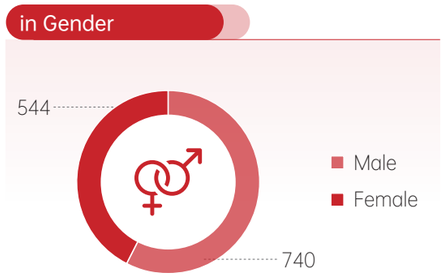
Plastic Barrels
43.02 %

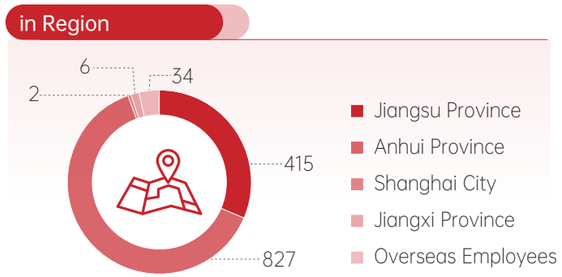
Empty Flux Cans
78.55 %

Pallets
47.15 %

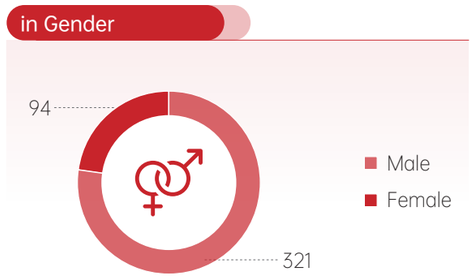
Social Indicators

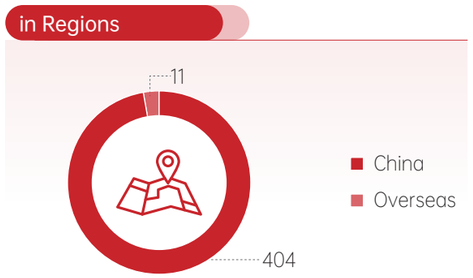
- Total Number of Employees **1,284**





- Total Number of Newcomers **415**





Average Training Hours per Employee
84 hours

Safety Training Sessions
12 times

Occupational Health Check Completion Rate
100 %

Employee Safety Training Completion Rate
100 %

Major Production Safety Incidents
0 case

Accident Rate per Million Working Hours
2.2

Deaths Due to Work Injuries
0 case

Number of Charity Events
Multiple

Total Charitable Donations
250 thousand CNY

Customer Satisfaction Rate
95.85 %

Customer Complaint Resolution Rate
100 %

Product Pass Rate
100 %

On-time Order Delivery Rate
100 %

Supplier Social Responsibility Commitment Signing Rate
100 %

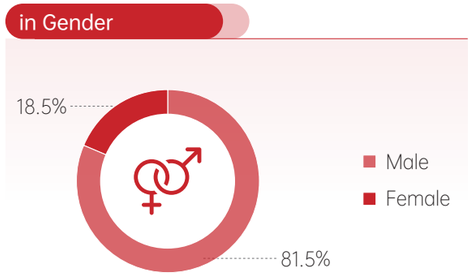
Number of Suppliers Participating in CSR Training
82

Governance Indicators

Operating Revenue
3.373 billion CNY

Total Number of Senior Management
27

in Gender



• Anti-Corruption Training

Board Learning Sessions
1 time

High-Risk Position Learning Sessions
3 times

Employee Training
1 time

Integrity Self-Discipline Commitment Signing Rate
100 %

Corruption Incidents
0 cases

Complaints Related to Corruption
0 cases

Human Rights Incidents
0 cases

Complaints Related to Human Rights
0 cases

01

Corporate Governance

Corporate Governance >>>

Governance structure

Seraphim strictly adheres to the Company Law of the People's Republic of China and relevant laws and regulations to establish a sound governance structure, ensuring the legality of corporate governance. This governance structure enables Seraphim achieve effective management and plays an important role in protecting shareholder interests, promoting stable corporate development, and enhancing market competitiveness.

Shareholders' meeting

The shareholders' meeting is composed of all the founders (shareholders) and serves as the highest authority of the company. Its responsibilities include deciding the company's business policies and investment plans, electing and replacing directors and supervisors, reviewing and approving the reports of the board of directors and the supervisory board, and reviewing and approving the company's financial budget, final accounts plan, and profit distribution plan, among others.

The board of directors

The board of directors consists of 7 members: Polaris LI, Justin XI, Robert ZHU, Yong YANG, Ze ZHOU, Leifeng GUO, and Hao HU. Among them, Polaris LI serves as the chairman, and Justin XI and Robert ZHU are vice-chairmen. The board is responsible for convening shareholder meetings, executing resolutions from the those meetings, approving the company's business plans and investment proposals, and formulating annual financial budgets and final accounts.

Polaris LI
Male
Chairman
Senior management: 15 years in the PV industry

Justin XI
Male
Vice Chairman
Marketing: Experienced in multicultural environment

Robert ZHU
Male
Vice Chairman
Business management

Yong YANG
Male
Director & CEO
Finance and investment

Ze ZHOU
Male
Director
Business management

Leifeng GUO
Male
Director
Finance and investment

Hao HU
Male
Director
Construction and operation of new energy zero carbon park

Our board members consist of professionals with diverse backgrounds and experiences in management, finance, investment, and marketing, which provides the company with a variety of perspectives and expertise, helping to improve the quality and rationality of the company's decision-making. Additionally, some directors possess extensive management experience in multinational companies, which is beneficial for developing business strategies that align with globalization trends, helping the company seize global market opportunities and mitigate the risks associated with multinational operations.

The board of supervisors

The Board of Supervisors consists of three members: Zhongya DING, Yang SHEN, and Jinchun YAO, where Zhongya DING and Yang SHEN are shareholder representative supervisors, and Jinchun YAO is the employee representative supervisor. The responsibilities of the Board of Supervisors include examining the company's finances, supervising the actions of the directors and senior management, and proposing the convening of extraordinary shareholders' meetings, among other duties.

Senior Management

The senior management team consists of 27 members who manage various functions and business sectors of Seraphim, including operations, finance, procurement, marketing, technology, manufacturing, legal affairs, quality, and overseas markets.

male 81.5%

female 18.5%

hold a master's degree or higher 6 people

have served the company for over 10 years 5 people

Governance in Sustainability

Seraphim remains committed to its mission of sustainable development, striving for a greater vision while enhancing technological innovation to support sustainability efforts. We follow the SustainSeraphim 360 model, proactively capturing opportunities for green growth, improving our environmental management, expanding our team of talented professionals, developing a sustainable supply chain, and partnering with stakeholders to fulfill our social responsibilities.

Mission and vision of sustainability

Mission: Shine for a better quality of life

Vision: Light up a Win-Win Future

SustainSeraphim 360 model

Shifting The Future

Harmonious Development
Focus on business interests while emphasizing the harmonious coexistence between humans and nature.

Environmental Protection
Adhere to scientific planning and energy conservation and emission reduction, aiming to achieve carbon peak by 2030 and carbon neutrality by 2060.

Product Innovation
Fueled by innovation, spearhead advancements in technology.

Customer Responsibility
Treat clients with respect and dignity, provide high-quality products and services.

Win-Win Cooperation Create
win-win relationships with stakeholders.

Employee Care
Build a people-oriented culture, protect employee rights, and value talent development.

ESG management structure

Sustainability Committee

The Seraphim Sustainability Committee is composed of three directors: Polaris LI, Wuzhong ZHU, and Yong YANG. The committee is responsible for developing the sustainability mission, vision, model, and roadmap, as well as overseeing the implementation of sustainability initiatives. It reports quarterly to the Board on progress in fulfilling sustainability responsibilities. Additionally, as representatives of Seraphim, the directors engage with stakeholders to enhance awareness of sustainability throughout the company and the solar industry, such as participating in industry ESG conferences, sharing the latest trends in ESG.

ESG Task Force

The ESG Task Force consists of ESG coordinators designated by various departments and production bases of the group. Their daily tasks mainly involve executing the work assignments assigned by the Sustainability Office, collecting and tracking ESG-related data and information from each department, and regularly generating insights. The ESG Task Force reports to the Sustainability Office weekly.

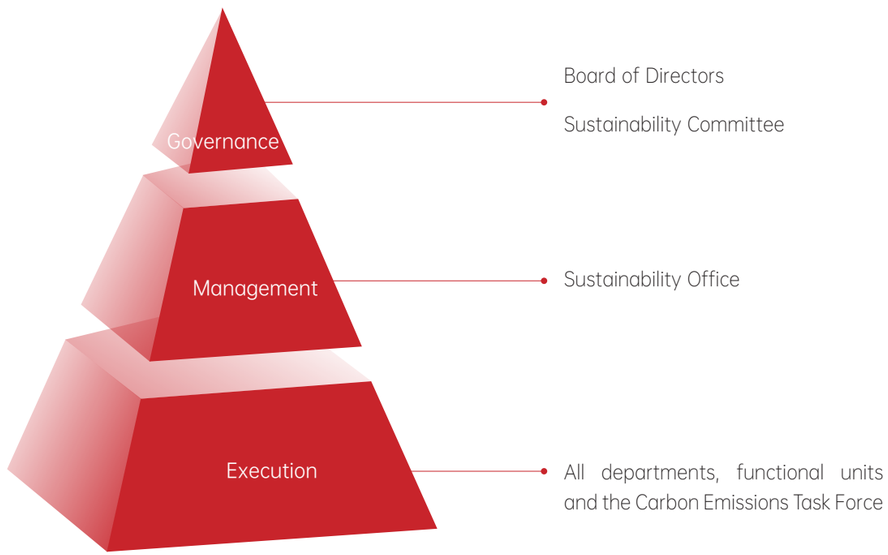
Sustainability Office

All departments and functional units play a role in sustainability. The CEO Office has taken the lead in establishing the Sustainability Office, which is composed of department and functional heads. This office is responsible for implementing the policies and regulations set forth by the Sustainability Committee and for promoting ESG initiatives across departments, branches, and subsidiaries. The Sustainability Office reports its progress to the Sustainability Committee on a monthly basis.

Carbon Emissions Task Force

The Carbon Emissions Task Force is a specialized group established to strengthen carbon management. This team is primarily responsible for monitoring and managing the company's carbon emissions, developing relevant carbon management policies and action plans, and establishing a carbon emissions management system to support the company's carbon reduction efforts. The task force provides monthly updates on its activities to the Sustainability Office.

ESG management structure



Stakeholder engagement

Stakeholders	Expectations for Seraphim	Communication Channels and Responses
Shareholders and Investors	Robust financial condition Promising business outlook Well-defined future plans Efficient corporate management Controllable risk exposure	Information disclosure Shareholders' meeting Investor briefing Investor hotline/mailbox
Government	Comply with local laws and regulations Promote local economic growth Generate positive social benefits Pay taxes in accordance with the law Promote local employment	Policy and regulation tracking Assign dedicated personnel to liaise with the government Actively participate in government activities Seek policy support Provide suggestions and recommendations Conduct regular visits
Clients	Commitment to integrity in business operations Continuously optimize product features and performance High product stability Environmentally friendly and safe products Provide high-quality and reliable customer service	Strictly enforce contracts Enhance quality control of products Promote technological innovation Provide high-quality services Promptly address customer complaints Conduct regular customer satisfaction surveys
Employees	Reasonable compensation and benefits Respectable working environment Opportunities for professional development Protection of legal rights Employee welfare provisions Comprehensive training system Excellent corporate reputation Smooth internal communication	One-on-one meeting Employee surveys Round-table discussions Suggestion box/hotline Satisfaction surveys
Suppliers	Well-established supplier management system Fair transactions Timely payments Maintaining a good partnership	Supplier review Regular visits Supplier conference Supplier training Integrity and contract compliance
Industrial Associations	Actively participate in industry events Engage in standard setting Support brand public welfare initiatives Maintain industry order	Exchange visits Industry forums Standard development Academic/research activities
Media	Current state of business and products Operational performance indicators Future development direction Corporate social responsibility	Press conference Interview invitation Inviting media to visit Seraphim
Community	Promote community development Protect environment Boost community employment Support public welfare initiatives	Community public welfare activities Citizen hotline Community development projects Regular visits and communication

02

Business conducts

Business conducts >>>

Seraphim always upholds the principle of integrity and is responsible to employees, shareholders, business partners, and the general public. We require all employees to adhere to universal ethical standards in their daily business activities and to strictly comply with the laws and regulations of each country.

In 2020, Seraphim issued the Business Conduct Guideline internally, which is an important document with global binding effect applicable to every employee of Seraphim. This code not only outlines the fundamental principles of compliance with the law but also establishes specific principled provisions in key areas such as anti-corruption, human rights protection, and antitrust. Additionally, it details the procedures for reporting misconduct and filing complaints, ensuring that all employees have a clear guide and support pathway when encountering ethical and legal issues.

With the Business Conduct Guideline, Seraphim is able to establish a high standard of business ethics globally while providing employees with a safe and fair working environment. This is not only our commitment to internal staff but also our commitment to external partners and society at large.

2021 Seraphim officially joined the United Nations Global Compact in 2021. We promise to fulfill the ten principles of the Global Compact, which are based on United Nations conventions and cover areas such as human rights, labor standards, the environment, and anti-corruption, and to report progress annually.

Seraphim respects the following international conventions and principles (including but not limited to):
ILO Convention 1 (Hours of Work – Industry)
ILO Conventions 29 (Forced Labour) and 105 (Abolition of Forced Labour)
ILO Convention 87 (Freedom of Association)
ILO Convention 98 (Right to Organise and Collective Bargaining)
ILO Conventions 100 (Equal Remuneration) and 111 (Discrimination – Employment and Occupation)
ILO Convention 102 (Social Security - Minimum Standards)
ILO Convention 131 (Minimum Wage Fixing)
ILO Convention 135 (Workers' Representatives)
ILO Convention 138 and Recommendation 146 (Minimum Age)
ILO Convention 155 and Recommendation 164 (Occupational Safety and Health)
ILO Convention 159 (Vocational Rehabilitation and Employment - Disabled Persons)
ILO Convention 169 (Indigenous and Tribal Peoples)
ILO Convention 182 (Worst Forms of Child Labour)
ILO Convention 183 (Maternity Protection)
Universal Declaration of Human Rights
The International Covenant on Economic, Social and Cultural Rights
The International Covenant on Civil and Political Rights
The United Nations Convention on the Rights of the Child
The United Nations Convention on the Elimination of All Forms of Discrimination against Women
The United Nations Convention on the Elimination of All Forms of Racial Discrimination
UN Guiding Principles on Business and Human Rights

2023 In 2023, Seraphim did not face any legal proceedings or other lawsuits related to anti-competitive behavior, antitrust, or anti-monopoly practices.

Anti-corruption

Seraphim firmly opposes any form of corruption and bribery and fully supports the United Nations Convention against Corruption. We are committed to establishing a clean cultural environment within the company and officially released the Seraphim Anti-Corruption Policy in 2023 to demonstrate our zero-tolerance stance towards corrupt practices.

Enhancing Awareness

We require all board members, senior management, employees, and suppliers to strictly comply with the Anti-Corruption policy. To strengthen the implementation of this policy, we have taken the following measures:

The board of directors
Every year, board members must participate in collective learning on anti-corruption and conduct self-inspections to enhance self-discipline in their daily behavior.

Positions with high corruption risk
The Human Resources Administration Department works close with the Audit Department to provide at least two anti-corruption training sessions each year for personnel in high-risk positions such as executives, procurement, sales, bidding, project approval, fund usage, and personnel management. The training content covers the latest regulations, policies, and cases of corruption.

Training for all
Integrity training for all employees is provided at least once a year. Additionally, anti-corruption training is a part of onboarding to ensure newcomers understand and adhere to the anti-corruption policy.

Periodically Communication
We periodically publish anti-corruption information, case warnings, policy interpretations, and other materials through various channels such as emails and websites, to enhance the anti-corruption awareness of all employees.

In 2023, Seraphim organized

anti-corruption collective learning session for the board of directors
1

learning sessions for personnel in high-risk positions
3

anti-corruption training session for all employees
1

All employees
of Seraphim signed the Statement on Integrity Self-Discipline Commitment.

Expectations for Suppliers

Every year, we send a Notice of Environmental/Health/Safety/Business Conduct Requirements for Relevant Parties to suppliers, clearly outlining our expectation for them to adhere to integrity standards in their business activities and strictly prohibiting any form of corruption or bribery. In addition, during the annual supplier audits and admission processes, we conduct a rigorous review of the suppliers' business conduct to ensure compliance with our anti-corruption requirements.

Corruption Risk Assessment

In July 2023, the Audit Department conducted an anti-corruption risk assessment alongside an internal audit. Following this assessment, one corruption risk was identified. To address this, the Audit Department offered guidance and training to the relevant employees, helping them enhance their understanding and improve their performance. As a result of this audit, we strengthened our capabilities in risk management and response.

Risk assessment procedures

Evaluate the business processes—including procurement, sales, bidding, project approval, fund utilization, and personnel management—to identify potential corruption risks, such as conflicts of interest, bribery, kickbacks, and abuse of authority.

Utilize both qualitative and quantitative methods, assess these identified risks to gauge their likelihood of occurrence and potential impact, ultimately determining their risk levels.

Based on these risk levels, appropriate risk response strategies will be established.

The Audit Department monitors high-risk areas on a daily basis and conducts annual internal audits.

In 2023, Seraphim did not encounter any incidents of corruption and did not receive any complaints.

Donation transparency

Seraphim follows these principles when making charitable contributions:

- We typically do not accept direct donation requests from individuals unless a thorough investigation confirms an urgent need.
- Prior to making any donations, we make it a priority to understand the beneficiaries, their backgrounds, and their specific plans for utilizing the funds, ensuring transparency and effective targeting.
- We are dedicated to preventing fraudulent donation activities and maintaining the integrity and fairness of our philanthropic efforts.
- We avoid donation initiatives that may present actual or potential bribery risks, thus safeguarding our commitment to social responsibility and legal compliance.

Human-right protection

The PV module manufacturing industry is facing increasing global scrutiny regarding human rights protection. In response to this concern, we earnestly commit to respecting and safeguarding human rights in all our business operations. In 2023, Seraphim released the Human Rights Policy.

Highlights of the human rights policy

1. We respect human right.

We are dedicated to respecting and upholding internationally recognized human rights, including personal dignity and privacy. We will not condone any violations of these rights.

2. We are against any form of forced labor and modern slavery.

Seraphim strongly opposes all forms of forced labor and modern slavery. We exercise caution when selecting suppliers and have implemented a raw material traceability system to ensure there are no instances of forced labor or modern slavery in our supply chain.

3. We support diversity, equality, and inclusion (DEI).

At Seraphim, we work alongside employees of diverse genders, nationalities, cultures, religions, and ethnicities. As a result, we have a zero-tolerance policy for discrimination, harassment, or any violations against employees or partners based on race, color, ethnic origin, gender, religion, age, disability, union or political affiliation, sexual orientation, or family status. We prohibit sexual harassment, corporal punishment, physical coercion, and verbal abuse, and we maintain a strict stance against threatening or aggressive behavior.

4. We practice workplace fairness.

We base our recruitment, selection, training, promotion, and compensation of employees exclusively on job-related factors such as merit, experience, and performance. All employees are guaranteed fair compensation, with wages that meet at least the minimum legal requirements, and we comply with national and local regulations regarding working hours.

5. We respect freedom of association and collective bargaining rights.

We recognize the rights of all employees to join associations and engage in collective bargaining for better working conditions. Seraphim works constructively and respectfully with employee associations, striving to find a fair balance between the company's economic interests and those of its employees. Our goal, even in times of dispute, is to sustain a productive and long-lasting partnership.

Currently, all security personnel at Seraphim have undergone human rights training to prevent potential risks of excessive use of force or other human rights violations.

Conflict minerals management

Seraphim does not endorse or use conflict minerals - minerals obtained from regions affected by armed conflict, illegal mining, or substandard working conditions. As outlined in the Conflict Minerals Policy Management Procedure released in 2022, we have integrated conflict minerals management into our processes for selecting new suppliers and conducting annual reviews of current suppliers.

The R&D department communicates material specification requirements and assesses the risks associated with conflict minerals.

If the minerals do not meet the requirements, the supplier must provide a written explanation and select a new source for the minerals.

The procurement department selects suppliers, requests sample confirmations, and provides suppliers with the Conflict Minerals Survey Form and the Commitment Letter on Not Using Conflict Minerals.

If the minerals comply with the requirements, the supplier and mineral information will be forwarded to the R&D and procurement departments.

Suppliers must complete the investigation and return the results within the specified timeframe. The quality control department evaluates whether the minerals meet the non-conflict mineral requirements.

Annual supplier audit

As part of the annual supplier audit, we ask qualified suppliers to fill out the Conflict Minerals Survey and sign the Commitment Letter on Not Using Conflict Minerals.

Grievance mechanism

Following the United Nations Guiding Principles on Business and Human Rights, Seraphim has implemented a grievance mechanism aligned with the Business Conduct Guideline. This mechanism prioritizes fairness, high accessibility, and the protection of whistle-blower privacy.

Employees who are aware of or suspect that another employee or a Seraphim representative is involved in illegal activities or actions that violate the Business Conduct Guideline may report this information to their supervisor or the audit department through various channels, including telephone, fax, the corporate intranet, or email - either publicly or anonymously.

Seraphim is committed to ensuring that no employee who reports such conduct in good faith, or assists in an investigation related to it, will face any restrictions, discrimination, or retaliation. We will make every effort to safeguard the privacy and safety of our employees.

03

We and the earth

We and the earth >>>

Climate change action

In March 2023, the Intergovernmental Panel on Climate Change (IPCC) released its Sixth Assessment Report Synthesis Report, titled Climate Change 2023. This report highlights the pressing need for more ambitious actions and stresses that if we take actions now, we can ensure a livable and sustainable future for all.

As a new energy company, Seraphim recognizes its responsibility to take significant steps in addressing climate change and to collaborate actively with our partners. Firstly, we must work together with our partners to reduce greenhouse gas emissions from our operations. Secondly, we should expand the application of our technologies and products in wider markets, delivering clean energy to more areas globally and supporting the transition to a sustainable energy future.

In 2023, Seraphim collaborated with a verification agency to evaluate greenhouse gas emissions for Scopes 1 and 2 at its three production bases: Seraphim Jiangsu, Seraphim Anhui, and Seraphim Jinzhai. Based on the assessment results, we set strategic objectives to achieve peak carbon emissions by 2030 and attain carbon neutrality by 2060. Following this, we developed measures to reduce emissions in our production processes and actively promoted these initiatives. Although we have not yet established specific reduction targets for Scope 3 greenhouse gas emissions, we have already initiated actions by engaging our key suppliers to collectively participate in emission reduction efforts throughout the value chain, working together to further climate change initiatives.

In 2023, the market-based Scope 1 and Scope 2 greenhouse gas emissions for Seraphim's three production bases were as follows..

Scope 1 **1,933** tCO_2e Scope 2 **27,578** tCO_2e

Total **29,511** tCO_2e Emission intensity **8.76** tCO_2e/revenue in millions of CNY

Notes:

1. The verification is conducted in accordance with ISO 14064-1:2018 Greenhouse gases Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals and ISO 14064-3:2019 Greenhouse gases Part 3: Specification with guidance for the verification and validation of greenhouse gas statements.
2. The greenhouse gas categories covered by the verification include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).
3. The report boundary encompasses all business operations of Seraphim Jinzhai, Seraphim Anhui , and Seraphim Jiangsu.
4. The reporting period is from January 1, 2023, to December 31, 2023.
5. The electricity emission factor is sourced from the 2021 Carbon Dioxide Emission Factor for Electricity published by the Ministry of Ecology and Environment and the National Bureau of Statistics of China.
6. The heat emission factor is sourced from the Guidelines for the Calculation and Reporting of Greenhouse Gas Emissions for Enterprises in Other Industrial Sectors (Trial).

Emission reduction within the organization

Green office

We promote the concept of green office in Seraphim. Employees are advised to switch off lights and fans before they leave their working place and to set air conditioning units to a minimum of 26 degrees Celsius during the summer months for energy saving. Moreover, any new electronic equipment purchased for office use, such as printers, must carry a first-class Energy Efficiency Label certification.

Upgrading Production Lines

We enhanced energy efficiency significantly through equipment upgrades and optimizations

- We retired older equipment, including string welding machines, laser scribing machines, and laminators, replacing them with more efficient alternatives. This transition has improved operational efficiency by approximately 15% and saved around 390,000 kWh of electricity annually - equivalent to the energy consumption of 48 tons of standard coal.

- For older air compressors in auxiliary rooms that displayed low energy efficiency, we acquired six SE75AD-8R and one GV-200WII-SVSDR variable frequency screw air compressors. The introduction of this new machinery has decreased energy consumption by roughly 15%, resulting in an annual electricity saving of 60,000 kWh, which translates to a reduction of 7.3 tons of standard coal usage.

- To optimize steam utilization, we installed plate heat exchangers in auxiliary rooms, effectively reducing steam consumption by the amount equivalent to 25 tons of standard coal each year.

Fleet Management

Seraphim China ensures that its fleet comprises only vehicles compliant with China's Stage 6 vehicle emission standards. The fleet is also guided by a principle of shortest route transportation to minimize fuel usage during product delivery from the factory.

Use renewable energy

The factory roof of Jiangsu Seraphim is equipped with photovoltaic panels. The rooftop photovoltaic power station provides part of the energy for the Jiangsu Seraphim site. In 2023, the rooftop photovoltaic power generation of Jiangsu Seraphim reached 1,988,275 kWh, accounting for 16.3% of the annual electricity consumption, with a reduction of 2,626.38 tCO2e.

Jinzhai Seraphim also purchases green electricity to offset carbon emissions. In 2023, Jinzhai Seraphim's green electricity purchase amounted to 1,820,360 kilowatt-hours, accounting for 15.01% of the annual electricity consumption, with a reduction of 3,837.24 tCO2e.

Energy Management

Seraphim Jiangsu has implemented an energy management system that adheres to GB/T23331-2020, ISO 50001:2018 and RB/T101-2013. This system encompasses the production of solar PV modules, covering processes like sorting, slicing, welding, lamination, assembly, solidification, testing, and packaging. It also includes the management of energy consumption in auxiliary production systems, such as power distribution rooms, air compressor rooms, chillers, and waste gas treatment facilities, as well as in ancillary areas like office buildings and canteens.

能源管理体系认证证书

江苏赛拉弗光伏系统有限公司
能源管理体系符合GB/T23331-2020/ISO50001:2018；RB/T101-2013《能源管理体系电子信息企业认证要求》

注册地址：常州市武进区横林镇通顺路10号（经营场所：武进区横林镇横溪路1-2）
经营地址：常州市武进区横林镇通顺路10号
生产地址：常州市武进区横林镇通顺路10号

认证范围：太阳能光伏组件的生产涉及的分选、切片、焊接、层压、组装、固化、测试、包装等过程以及辅助生产系统（配电房、空压机房、冷水机组、废气处理装置）和附属生产系统（办公楼、食堂）用能过程的管理
(获证客户本年度产品单位产量/产值综合能耗及能源管理体系边界见证书附件,证书附件是本证书组成部分)

统一社会信用代码：91320412569104867N
证书编号：04323En0070R0M-0
初次获证日期：2023年06月26日
发证日期：2023年06月26日
有效期至：2026年06月25日

签发人：孟咏歌

证书专用章

Notes:

1.GB/T23331-2020 is the national standard of China, named Requirements and Guidance for Energy Management Systems.

2.ISO 50001:2018 is the international standard named Energy management systems - Requirements with guidance for use, published by the International Organization for Standardization (ISO).

RB/T101-2013 is a widely recognized industrial standard in China for Energy Management Systems in Electronic Information Enterprises, named Energy management systems - Requirements for certification on electronics and information enterprises.

Energy Consumption

Natural Gas **4.945** cubic meters	Gasoline **60.24** tons	Diesel **34.57** tons
Total Purchased Electricity **49,687.28** MWh	Total Electricity Consumption **51,756.756** MWh	

Value chain emission reduction

Seraphim has actively engaged with and supported our clients in their efforts to lower GHG emissions for years. In 2023, we took a significant step by broadening our environmental initiatives to include a formal carbon reduction program targeting our key suppliers. We now require these suppliers to provide an annual carbon footprint report for the products they deliver, thus bringing our emission reduction initiatives into the upstream supply chain. This initiative underscores our commitment to extending climate action beyond the company itself and into the wider industrial ecosystem. Moving forward, we aim for Seraphim and our suppliers to collaborate in developing and implementing effective strategies for emission reduction, all geared toward achieving our common objective of sustainable development.

The Seco series PV modules has successfully achieved the French Carbon Footprint ECS certification.

In 2023, Seco's series of PV module products successfully passed the French Carbon Footprint ECS certification. This certification scheme is established by the French Energy Regulatory Commission (CRE) for PV products with a capacity of 100 kilowatts or above entering the French market. Companies participating in PV module tenders in France must submit the "Simplified Carbon Emission Assessment" (ECS) certification. This certification signifies that the Seco series products are approved for entry into the French market. Evaluation results indicate that the carbon emission intensity of the Seco series PV modules is as low as 417.11 kg CO_2/kWp, approximately 15% lower than that of commonly used module models in France.

The following Seco series products have obtained ECS certification:

SRP-395~420-BMD-BG	SRP-525~555-BMA-BG
SRP-440~465-BMB-BG	SRP-440~460-BMB-HV
SRP-525~555-BMA-HV	SRP-390~415-BMD-HV

Pollution prevention

Seraphim is committed to continuously mitigating the negative environmental impacts caused by our business activities and actively generating environmental benefits through innovations in products and technology. We continually enhance our environmental management strategies in our production and operational processes, adopting green construction and management practices to foster sustainable environmental development.

Sewage treatment

- We have established a water recycling system that effectively recovers and reuses cooling water generated during the production process. This initiative not only reduces water resource consumption but also minimizes wastewater generation.
- We rigorously comply with the "Wastewater Discharge Standards" and contract monitoring agencies each year to collect and analyze samples of domestic sewage, ensuring that our discharge metrics meet national standards.
- We have established a rain-sewage diversion system.
- Domestic sewage is pre-treated in septic tanks prior to being sent to municipal wastewater treatment plants.

Exhaust gas management

- We rigorously comply with the "Integrated Emission Standard of Air Pollutants" to ensure that our exhaust emissions meet regulatory requirements.
- We have implemented cutting-edge exhaust gas treatment technologies, which include multi-layer filter cotton, a three-stage activated carbon adsorption system, and a catalytic combustion system. These solutions effectively treat exhaust gases produced during welding, lamination, and cleaning processes, achieving a volatile organic compounds (VOCs) removal rate of over 95%, thus ensuring adherence to the mandated emission standards.
- Replacing coal-fired boilers with natural gas boilers has led to a significant reduction in the emissions of air pollutants, including sulfur dioxide and nitrogen oxides.

Noise reduction

- We prioritize low-noise equipment, employ enclosed muffler covers for transmission components, and apply sound-absorbing and noise-reducing materials on high-noise machinery to decrease overall sound levels.
- High-noise machinery, including water pumps, air compressors, and refrigeration units, is situated in the power room, where soundproof doors and windows are installed, along with sound-absorbing panels on the walls to limit noise escape to the outside.
- Vibration-damping platforms and isolation foundations are utilized for vibrating equipment to mitigate noise generation and transmission.
- The fans of air conditioning units are fitted with vibration-damping bases, while mufflers are added to the main exhaust ducts of air conditioning and purification systems, and flexible connections are incorporated at inlet and outlet pipes.
- Rubber vibration isolation pads are used for water pump foundations, and flexible rubber joints are installed on the suction and discharge pipes to reduce vibrations.
- For cooling towers, we select axial flow fans, which are quieter than traditional cooling towers, and place sound-absorbing foam at the bottom, along with implementing measures to dissipate energy and reduce noise from water droplets.
- The noise produced by overlay welding machine and laminating machine is one of the main sources of sound in the workshop. To mitigate this, machines are centrally and hermetically arranged, separated from other production areas by plastic curtains, and shock-absorbing devices are installed underneath the equipment..
- For workstations with higher noise levels, we provide personal protective equipment, such as earplugs and earmuffs, to ensure worker safety.

Solid waste management

- We have installed a hazardous waste video surveillance system that covers key locations such as the entrances and exits of hazardous waste storage facilities, the interior of the facilities, loading and unloading areas, and the passageways for hazardous waste transport vehicles.
- For municipal solid waste, dedicated clean garbage bins have been established, and we promote paper conservation, encouraging the use of recyclable materials in everyday office activities.
- General solid waste is sorted and handed over to specialized departments for thorough cleaning, recycling, or reuse.
- In terms of hazardous waste, we strictly follow the Standard for Pollution Control on Hazardous Waste Storage (GB18597-2001) and other applicable regulations regarding storage and transportation, ensuring that disposal is entrusted to qualified waste management companies.

In 2023, we enhanced our waste recycling initiatives, leading to a notable increase in the percentage of waste recycled compared to 2022.

Hazardous Waste Generation

Categories	Unit	Year 2023
Waste flux	tons	2.1
Waste activated carbon	tons	1.79
Waste oil	tons	1.92
Xylene waste liquid	tons	0.27
Empty flux containers	tons	0.44
Total	tons	6.52

Waste Recycling Volume

Recycled Items	2022		2023		Increase Ratio
	Volume	Percentage	Volume	Percentage	
Plastic buckets	185	43.02%	1,401	53.37%	↑ 24.06%
Empty flux containers	1,461	78.55%	2,358	89.79%	↑ 14.31%
Pallets	7,725	47.15%	18,779	70.03%	↑ 48.53%

Quantity of raw materials scrapped for 2023

Catogaries	Unit	Volume
Solar Cells	pieces	2,269,893
Encapsulant Film	m2	61,252.56
Backsheet	m2	20,074.75
Glass	pieces	2,969
Aluminum Profiles	pieces	21,890
Junction Boxes	sets	2,436
Interconnection	kg	1,581.38
Busbar Ribbon	kg	1,080.20
Bulk Silicone	kg	34,768.40

Notes: The statistics presented above include data from Jiangsu Seraphim Solar System Co. Ltd., Anhui Seraphim Energy Co., Ltd., and Jinzhai Seraphim Energy Technology Co., Ltd..

Water and Land resources

Climate change is worsening existing water stress and significantly affecting the water cycle, leading to changes in the quantity, spatial-temporal distribution, and quality of water resources. According to the 2021 United Nations World Water Development Report, global freshwater consumption has increased sixfold in the past century. Currently, one in three people around the world lacks access to safe drinking water. Projections indicate that by 2025, 3.5 billion people will experience water scarcity, and by 2050, 5.7 billion will face severe water shortages for at least one month each year.

In the production of PV modules, we do not substantially consume water resources, and PV power generation itself is water-neutral. As a water-friendly energy source, the advancement of solar energy technology is poised to be a key solution to energy challenges in regions suffering from water scarcity. In 2023, we consumed a total of 182,469 tons of water.

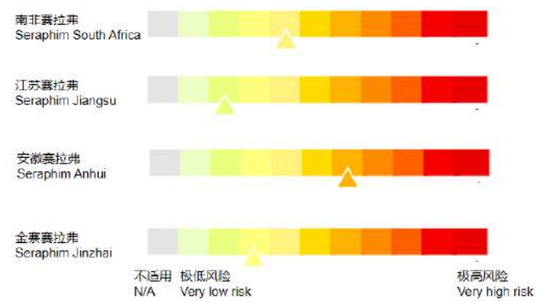
Total Water Consumption
182,469 tons

Intensity of water consumption
54.09 tons/ revenue in millions of CNY

Water risk assessment

While our production processes do not require significant water usage, we proactively implement various water-saving measures to help alleviate global water stress.

In 2023, we utilized the World Wildlife Fund (WWF)'s Water Risk Filter to assess the availability of water resources - specifically, the abundance or scarcity of freshwater - at the sites of our four major production bases worldwide, including the one in South Africa.



The analysis indicated that among the four bases, Seraphim Anhui in Yingshang County faces the greatest risk regarding water availability, followed by Seraphim South Africa. Seraphim Jinzhai has a relatively lower risk, while Seraphim Jiangsu faces the least risk. This evaluation has provided us with a clearer understanding of the water resource risks each Seraphim production base faces. Consequently, we will continue to implement our existing water-saving initiatives while further refining the water-saving plan for Seraphim Anhui..

Alleviate water pressure

In our daily operations, we have implemented a range of effective water-saving measures, actively engaged in efficient water management practices, and significantly enhanced the efficiency of water resource utilization.

The water needed for production primarily comes from the municipal water supply and is utilized for domestic purposes within the plant area, as well as for boiler operations, cooling systems, and other applications. We employ a water recycling system in our production processes to conserve water. For example, at the industrial park housing Seraphim Jinzhai, the water supplied to the component factory first passes through the power station's circulating water system for chemical treatment, resulting in purified water that is then provided to various processes, including the wafer cutting machines in the factory.

Additionally, we promote a water-saving culture by placing visible signage throughout the company to educate employees on the importance of water conservation. All water fixtures are fitted with water-efficient devices, such as low-flow faucets, water-saving toilets, and efficient shower systems. Furthermore, wastewater generated in office areas is reused for irrigating greenery, thus further reducing water consumption.

Proper land use

Construction of production bases and PV power plant projects inevitably impacts land resources. We actively implement following measures to mitigate these impacts in different stages of the project.

Site selection stage

During the site selection process, Seraphim strictly follows the land use planning requirements set by the host country, ensuring that projects avoid sensitive areas such as nature reserves, scenic areas, world cultural and natural heritage sites, drinking water protection zones, forest parks, geological parks, and significant wetlands.

Construction stage

Construction activities should minimize land occupation, reduce damage to surrounding vegetation, and prevent soil erosion.

- Strengthen construction management by delineating construction zones, selecting appropriate transportation routes, and minimizing surface disturbance.
- Promptly remove and dispose of construction waste to decrease the length of time materials are stored on-site.
- After construction, initiate greening efforts in the factory area to mitigate vegetation loss due to the project.
- Avoid working during heavy storms to lessen soil erosion caused by construction activities.
- Improve environmental awareness among construction personnel, strictly prohibiting any unauthorized destruction of vegetation outside designated construction zones.
- After construction, promptly engage in greening activities, such as planting flowers, grass, shrubs, and trees to enhance the environment.

Land-saving solutions

The solar project in Nanyang, Henan, employs flexible supports to establish an "aerial PV" model. This design elevates PV panels above the forest, effectively integrating power generation with forest conservation efforts. The project preserves 60 acres of woodland, optimizes land use, minimizes disruption to wildlife habitats, and safeguards the local ecosystem. With a total installed capacity of 3MW, it results in a reduction of annual carbon emissions by 4,668.64 tons. In addition to facilitating the efficient use of clean energy, the project actively promotes soil and water conservation, supporting sustainable ecological development.

Ecosystem conservation

Seraphim prioritizes the protection of the ecological environment in its production operations and project development. During the planning phase of all construction projects, we mandate comprehensive ecological impact assessments and follow the principle of avoidance, steering clear of ecologically sensitive and fragile areas. At present, all Seraphim projects strictly adhere to land use regulations during both construction and operation, ensuring that we avoid nature reserves, drinking water source protection zones, and significant wetlands. This approach effectively prevents our business activities from adversely affecting the regional ecological environment.

Combination of aquaculture and PV power generation in Chongming Island

On Chongming Island in Shanghai, Seraphim's products have been incorporated into a power generation project that combines fishery operations with photovoltaic (PV) systems. This project integrates floating solar panels with underwater aquaculture and helps establish Chongming Island as a model for eco-friendly development. We provided 570W TOPCon high-efficiency PV modules for the initiative, which has a total installed capacity of 3.16 MW. The execution of this project is projected to reduce carbon dioxide emissions by approximately 4,918 tons, delivering an environmental benefit comparable to planting 2,695 trees.

04

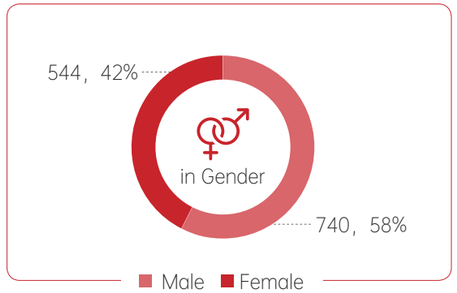
We and our employees

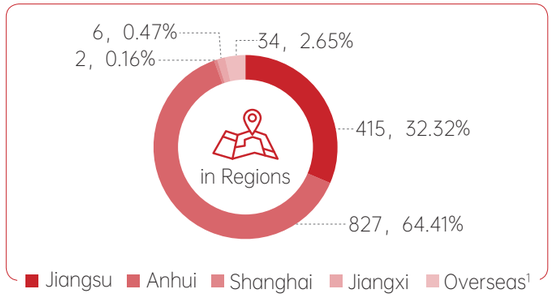
We and our employees >>>

Seraphim has brought together a team of bold and proactive professionals dedicated to solar energy. They advocate for solar energy across industrial, commercial, and residential sectors and are committed to developing and delivering high-quality products and services. Additionally, they grow alongside our clients and share a common passion for progress with their peers.

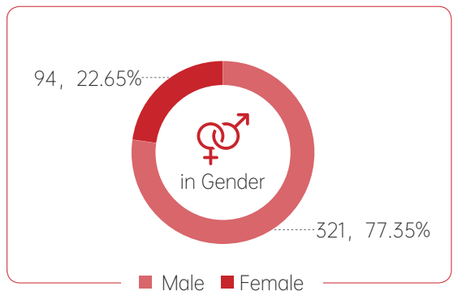
Without a doubt, our employees are one of Seraphim's most valuable intangible assets. We deeply value this team, which is why we wholeheartedly commit to listening and communicating with them, caring for their well-being, fostering an inclusive and collaborative work environment, supporting their professional growth, providing comprehensive benefits, and ensuring their health and safety.

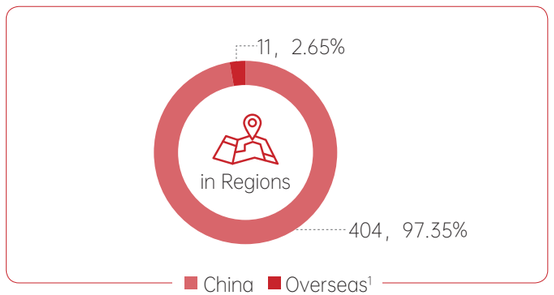
Employees: 1,284





新入职员工：415人





Percentage of senior management hired from the local community2

82%

Percentage of employees undergoing regular performance and career development evaluations

100%

Notes:

1. Overseas employees are primarily located in the Asia-Pacific region, Europe, Latin America, South Africa, East Asia, the Middle East, the United States, Turkey, and other areas.

2. "Local" refers to the country in which the operating point is located; "senior management" refers to employees at the level of unit head or above; and "key operating point" refers to the region where the main product sales, production bases, and office locations are situated.

Employee engagement

We are committed to fostering an open, transparent, and effective two-way communication environment. This mechanism helps eliminate barriers, leverage collective intelligence, and drive Seraphim forward.

Employees can utilize various communication channels to interact with the company. Regular roundtable meetings are organized, providing a platform for open discussions between employees and management, where experiences and project challenges can be shared. Each year, satisfaction surveys are distributed to assess employee contentment with company policies, benefits, and opportunities for career development, as well as to gather suggestions for management improvement. Every operational site features a suggestion box where employees can submit their ideas or report misconduct in writing. Furthermore, employees are encouraged to express their concerns via email at any time.

Upon receiving feedback and opinions from employees, we will form a dedicated task force to address any issues. We will hold discussions with employees to capture their viewpoints, develop response strategies, and provide feedback in return.

Development

Providing development opportunities for employees not only benefits their personal growth but also propels the entire organization towards success, thereby creating a win-win situation for both the company and its employees.

Employee Training

We support new employees in integrating into Seraphim, helping them understand the company's business development and master job skills. We categorize employees into four sequences: "Reserve Cadres, Production and Operations Management, Middle Management, and Senior Management," providing them with specialized training programs. Based on the employees' business knowledge needs, we develop a variety of specialized business courses to aid their career development. For employees who wish to gain experience in different positions, we offer transfer training to help them acquire new job skills.

The training we provide to our employees:

- **Onboarding for New Employees**
  - Corporate culture, rules and regulations, quality awareness, 5S, EHS
  - Job skills, such as business SOPs, related systems, job responsibilities
- **Training for Current Employees**
  - Providing relevant skill enhancement courses for different positions
- **Professional Business Knowledge Training**
  - Offering production process training for frontline production and technical workers
  - Providing R&D technology and software tool training for technical staff
  - Offering finance and taxation training for finance personnel
  - Providing English training for staff whose daily office language involves English
  - Offering advanced office software courses for all employees
- **Rotation Personnel**
  - Training for job transfer and competency training for new positions

This is how we structure our training system:

Needs Assessment

Conduct training needs assessment using methods such as surveys and interviews, and analyze in conjunction with job descriptions, employee competency levels, work performance, and company development strategy to identify training needs.

Plan Development

The Human Resources Administration Department compiles and analyzes the training needs from various departments and, in line with the company's development plan, talent strategy, and budget, formulates the company's Annual Training Plan.

Plan Execution

Conduct training activities according to the Annual Training Plan.

Annual Review

Review the execution and effectiveness of the annual training each year to prepare for the next year.

In addition to the training programs organized internally by Seraphim, employees are encouraged to submit external training applications to the Human Resources Department if they identify high-quality training opportunities outside the company. Upon completion of external training courses, employees are encouraged to share their learning experiences and insights with their colleagues, fostering knowledge exchange and sharing within the organization. Furthermore, the company strongly advocates for employees to utilize their spare time for self-improvement activities, such as pursuing advanced degrees, professional certification exams, and vocational qualification upgrades.

In 2023, the average training hours per employee at Seraphim

reached **84** hours

marking increase compared to 2022 **16.67** %

Incentives

To stimulate employees' work enthusiasm and innovation capabilities, Seraphim has established the "Seraphim Innovation Management Incentive Fund." This innovation fund covers areas such as technological innovation, management optimization, and market expansion. We allocate at least 5% of its annual net profit to recognize outstanding employees and teams with exceptional performance, further motivating employees to enhance their work enthusiasm and innovation capabilities, thereby creating better benefits for the company.

In 2023, we awarded commendation medals to 11 teams and 28 employees.

Training on Photovoltaic Manufacturing for Summer Interns

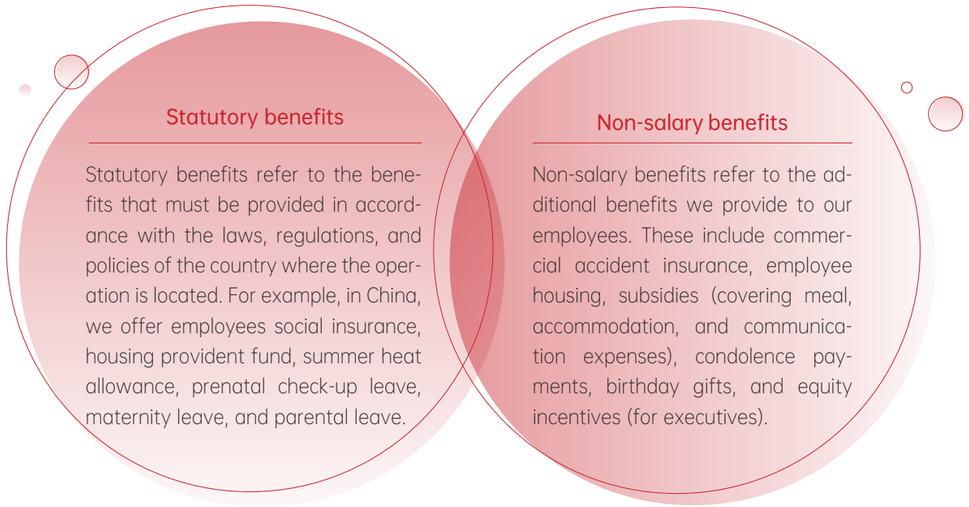
In July 2023, Seraphim Anhui conducted a specialized training session focused on the "Photovoltaic Module Production Process" and the "Performance of Eight Major Materials."

The training combined theoretical explanations with practical case studies, using these topics as entry points to provide a comprehensive overview of the advantages, disadvantages, and solutions for various photovoltaic modules under different conditions.

This training not only deepened the summer interns' understanding of photovoltaic manufacturing processes but also equipped them with the essential skills required for their roles. Additionally, it sparked their interest in the photovoltaic industry, laying a solid foundation for their future involvement in the sector.

Welfare

Seraphim has established a comprehensive welfare security system, which includes both statutory benefits and non-salary benefits.



In response to the government's call to build a fertility-friendly society, we provide female employees with maternity check-up leave, maternity leave, and breastfeeding leave, while offering male employees paternity leave. Both male and female employees are entitled to parental leave until their child reaches the age of three. By providing these leaves, we aim to create a more family-friendly environment for our employees and support their family life.

Parental Leave Employee Status

Categories	Male	Female
Total number of employees eligible for parental leave	740	544
Number of employees on parenting-related leave during the year	16	11
Number of employees who returned to work after parenting-related leave during the year	16	11
Number of employees who returned to work after parenting-related leave and were still employed 12 months later	14	11
Rate of return to work of the Seraphim Group employees	87.6%	100%

For overseas employees, Seraphim has established differentiated incentive policies, offering relevant subsidies such as relocation allowances. Additionally, Seraphim provides a variety of non-salary benefits, including additional leave for visiting family in addition to statutory annual leave and regular holidays. The company also offers free accommodation (or housing subsidies), free work meals (or meal allowances), and purchases overseas insurance and other related protections for its employees.

This year, we organized outdoor activities, parties, and numerous cultural events to promote collaboration and strengthen relationships among employees, improving workplace morale. These initiatives also aimed to alleviate stress, spark creativity, and align our team with the company's values and mission. Ultimately, our goal is to create a vibrant and inclusive work environment that supports personal and professional growth.

Health and Safety

We place a high priority on the occupational health and safety of our employees and have established a safety management system that includes prevention, training, safety assurance, emergency response, and post-incident handling. Our EHS department has led the development of several management regulations, such as the Occupational Health Control Procedures, Safety Incident Management Regulations, Work Safety Responsibility System Management Regulations, and First Aid Kit Medicine and Equipment Configuration Management Regulations. These efforts are continuously advancing the construction of a long-term mechanism for work safety and enhancing the level of safety management. Seraphim has obtained the ISO 45001 Occupational Health and Safety Management System certification. Annually, we conduct regular internal audits and undergo surveillance audits by certification bodies to continuously improve our occupational health management system.

Prevention

We have established multiple preventive mechanisms and developed procedures such as the Safety Risk Identification and Control Procedure and the Safety Inspection Management Regulations to identify and warn against safety risks.

Each department establish a safety risk identification and evaluation team. The team regularly conduct safety risk identification and control activities to assess potential safety hazards.	In areas with significant safety risks, safety warning signs are installed, indicating the name of the major safety risk, the types of accidents that may occur and their consequences, the main control measures, and emergency response measures.	Occupational hazard warning signs have been installed in the production area, and notices about the provision of professional protective equipment have been posted.
Regular pre-assessment of occupational disease hazards is conducted, comprehensively identifying potential harmful factors in the production environment, labor processes, and special environments.	In accordance with the Specification for the Selection of Personal Protective Equipment (GB/T 11651 - 2008), standard-compliant personal protective equipment has been provided to employees by the company. The risk of occupational diseases will be effectively reduced, and the safety of employees during operations will be ensured.	Annual occupational health check-ups are provided for all employees to promptly identify and prevent work-related illnesses, ensuring the well-being of the staff.

Training

We regularly conduct occupational health and safety training aimed at enhancing employees' awareness of environmental, health, and safety issues, as well as their ability to prevent risks, thereby preventing and reducing various accidents and occupational hazards. In 2023, we organized 12 safety training sessions, including general training for all employees and specific training for certain positions. For all employees, we offered courses such as fire safety training, job safety operation training, and risk identification training. For specific employee groups, we provided tailored training based on the safety risks they face. For example, we offered specialized safety training for forklift drivers, electricians, and truck drivers, and hazardous chemical training for employees in warehouses and workshops who may come into contact with chemicals in their daily work.

We aim to enhance employees' safety awareness and emergency response capabilities through training, thereby effectively reducing the incidence of workplace accidents. Through systematic training, employees will be able to identify potential safety hazards, follow operating procedures correctly, and master skills to handle emergencies. We firmly believe that only when every employee fully recognises and values occupational health and safety can we create a safer working environment.

Additionally, we continuously collect feedback from employees on the training to optimize the content and format, ensuring the training is effective and targeted. We encourage employees to actively participate and apply the knowledge they have learned in their daily work, fostering a culture where everyone is concerned about safety and proactively prevents risks. Through collective efforts, we aim to achieve the goal of zero accidents and provide employees with a safer and healthier professional development space.

In June 2023, Seraphim Anhui organized a safety knowledge competition to strengthen employees' awareness of safety practices and enhance their safety skills. Guided by the principle of "promoting learning through competition and applying knowledge through learning," this event not only sparked enthusiasm for safety education among employees but also significantly increased their participation. It fostered a strong culture within the company where "everyone talks about safety, and everyone knows how to respond to emergencies," thus elevating the overall safety awareness of all staff and laying a solid foundation for effective safety management within the organization.

Safety knowledge competition

Safety assurance

Personal protective equipment (PPE)

To protect employees from occupational hazards, we provide personal protective equipment (PPE) that meets national standards, such as cut-resistant gloves and noise-reducing earplugs, and conduct training on their proper use. Employees must wear PPE correctly before starting work. The EHS department conducts regular inspections to ensure the correct use of PPE and prevent workplace injuries.

First aid kit and medical equipment

We have placed first aid kits and medical equipment at the worksite. We conduct monthly inventories of the first aid kits and medical equipment, checking for any damage to the kits and ensuring that all medications and instruments are within their expiration dates.

Fire and safety equipment

To strengthen fire safety management and prevent fire incidents, we have established a fire safety leadership group, developed a fire safety management system, formed a volunteer firefighting team, conducted fire safety awareness training, implemented fire prevention inspections, and maintained firefighting facilities and equipment.

Emergency Response

Seraphim has established an emergency response plan system for various potential risk scenarios, including fire emergency, food poisoning, flood prevention, electric shock accident, chemical spill. These emergency plans ensure that we can respond quickly and efficiently to various emergencies, minimizing casualties and property damage.

The company regularly organizes various emergency drills, using simulated scenarios to enhance employees' emergency response capabilities and operational proficiency. After each drill, a review and optimization process is conducted to continuously improve the execution details of the emergency plans.

Post-Incident Handling

Following the incident, we maintained the scene in its original state and submitted relevant materials for review by the investigation team. For pollutants generated by the incident, we strictly adhered to requirements for cleaning and disposal to prevent secondary pollution. Production will only resume after relevant departments confirm that conditions are met and issue an order to restore production. Meanwhile, the EHS department or relevant departments will refine the emergency response plan based on the summary report of the emergency rescue to enhance the ability to respond to future incidents.

Health Check Completion Rate

100%

All employees completed their occupational health check on time, ensuring effective monitoring of their health status.

Employee Safety Training Completion Rate

100%

The company's safety training program was fully implemented, with every employee participating in the relevant safety training.

Major Production Safety Incidents

0

The company's safety production management system operates stably, effectively preventing major incidents.

Accident Rate per Million Work Hours

2.2

This rate indicates the frequency of work hours lost due to accidents per million work hours; a lower value indicates higher production safety.

Number of Fatalities from Work Injuries

0

The company has effectively implemented measures for work injury prevention and on-site safety control, ensuring the safety of employees' lives.

Occupational Disease Hazard Incidents

0

The company has achieved significant results in occupational disease prevention and work environment optimization, protecting employees from occupational diseases.

Equity

Seraphim is committed to the principles of openness, equality, and inclusiveness throughout the entire employee recruitment, onboarding, and daily work processes. Our goal is to create a workplace environment that is inclusive, equitable, and united.

To support institutional development, the company has established a Recruitment Management System and a Code of Business Conduct, which provide clear and explicit guidelines for our recruitment processes and professional behavior. We strictly prohibit any form of discriminatory practices. Both in the recruitment phase and in subsequent promotions and performance evaluations, we prioritize ability and performance as the core evaluation criteria. This approach creates a fair competition platform for every employee, ensuring that all have equal opportunities for development.

Compensation is another essential element of our commitment to equality. Seraphim implements "equal pay for equal work," ensuring that employees are not subjected to unequal wages based on factors such as gender or race. Furthermore, our company offers all employees compensation that exceeds the local minimum wage standard, ensuring timely and full payment of wages. We also closely monitor economic developments and market trends, regularly adjusting salaries to maintain competitive compensation for our employees.

Our diverse and inclusive workplace culture not only respects the fundamental rights of employees but also fuels innovation and sustainable development within the company. As a result of these measures, the company has not encountered any discriminatory incidents during the reporting period.

Annual total compensation ratio	the ratio of the annual total compensation for the organization's highest-paid individual to the median annual total compensation for all employees (excluding the highest-paid individual)	9.5:1
	the ratio of the percentage increase in annual total compensation for the organization's highest-paid individual to the median percentage increase in annual total compensation for all employees	2:1

Notes: The highest paid individual is the CEO. The scope of employee statistics is all employees of the Group (excluding CEO).

05

We and our community

We and our community >>>

Energy justice

Achieving a global energy transition requires addressing energy distribution justice. Seraphim is actively establishing production bases in underdeveloped regions of western China, facilitating the transfer of new energy technologies and enhancing the energy transition capabilities of these areas.

In 2023, Seraphim announced a plan for a 1GW high-efficiency module project in Guangnan County, located in the Wenshan Zhuang and Miao Autonomous Prefecture of Yunnan Province. This county, regarded as underdeveloped, reported a per capita GDP of 25,606 CNY in 2023, approximately 12.8% of Beijing's per capita GDP. The project involves a total investment of 300 million yuan and, upon completion and full production, is anticipated to generate an annual output value of 7 billion yuan, about 100 million yuan in annual taxes, and provide around 250 job opportunities.

This initiative is expected to not only boost employment in Guangnan County and enhance the livelihoods of local residents but also contribute to the area's tax revenue, thus supporting the healthy and sustainable development of the local economy.

Mitigation of negative impacts

Seraphim's potential negative impacts on the community primarily stem from two aspects: component manufacturing and the construction and operation of production facilities. In the component manufacturing process, insufficient control over product quality and safety could directly affect customers. As for the construction and operation of production bases, this process poses potential risks to surrounding residents and the local ecosystem.

To address the potential impacts of component manufacturing, Seraphim has implemented extremely stringent quality management measures. Each product line must undergo comprehensive quality and safety testing before official release to eliminate various hazards. Upon product release, an Installation Manual is also provided, offering safety operation and daily maintenance guidelines for customers and installation personnel, ensuring safety during the installation and use of components. Additionally, Seraphim conducts Substance of Very High Concern (SVHC) testing on products to ensure that the content of hazardous substances remains within acceptable levels.

Regarding production bases, there are potential environmental pollution risks throughout their lifecycle. Please refer to Chapter 3 for more detailed information.

In 2023, Seraphim did not experience any regulatory violations related to the health and safety impacts of its products and services.

Community development projects

As Seraphim strives to provide cleaner energy solutions and protect the Earth for future generations, we also prioritize the health and well-being of vulnerable communities. For many years, Seraphim has maintained a dedicated partnership with the Fenghang Children's Learning Ability Training and Rehabilitation Center in Tianning District, Changzhou. Through various initiatives, we consistently support the autistic community. In 2023, we organized three children's companionship activities at the rehabilitation center, adhering to the guidelines set forth by the United Nations Children's Fund (UNICEF) Minimum Standards for Child Protection in Humanitarian Action. Additionally, this year we donated 250,000 CNY to the Changzhou Charity Association to assist in the rescue of vulnerable groups and to support other public welfare projects.

Charitable donations supporting vulnerable groups aspiration

On the afternoon of July 7, 2023, the second general meeting of all members of the Henglin Town Branch of the Wujin District Charity Association was successfully held, accompanied by a charitable donation ceremony. During this meeting, Seraphim Energy Group donated 250,000 CNY to the Wujin District Charity Association in Changzhou, aimed at bolstering charitable efforts for vulnerable populations. The meeting also reviewed and approved the personnel arrangement plan for the second board of directors of the Henglin Town Branch and the proposed list of members for the new board. Notably, Seraphim was elected as a member unit of the second board of directors of the Henglin Town Branch of the Wujin District Charity Association.

> "Charity is like a warm ray of sunshine, and at Seraphim, we embody our vision of 'shifting the future into a better world' through our actions."
>
> — Polaris LI, Director of Seraphim

06

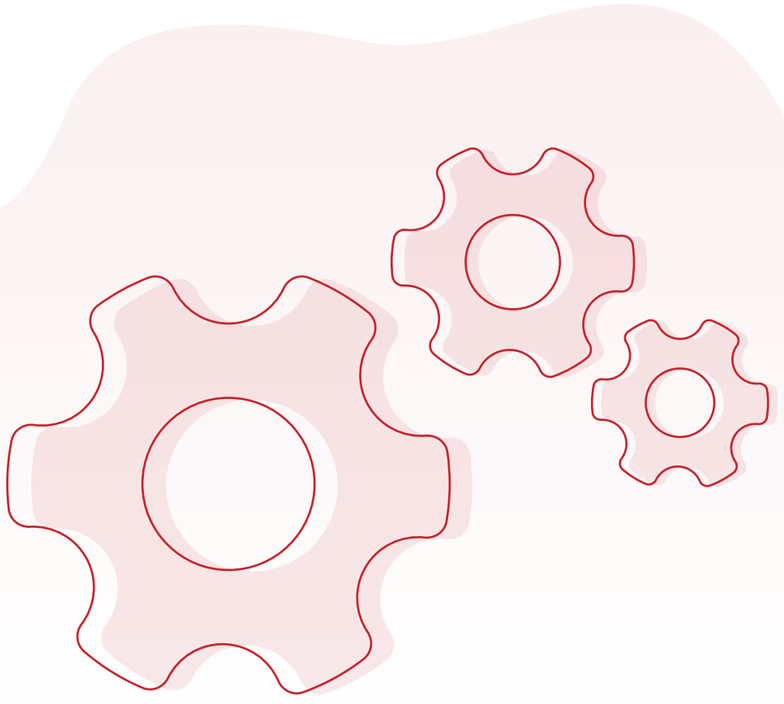
We and our products

We and our products >>>

Management System

Quality Management Process

"Quality First, Quality Integrated into the Entire Business Process, Continuous Improvement"—guided by this principle, Seraphim has established a quality management system centered on customer needs and compliant with ISO 9001 standards. Through the collaborative efforts of four key departments—R&D, procurement, manufacturing, and service—the company has developed standardized processes that cover the entire product lifecycle, clearly defining quality management standards and responsibilities for each department. Leveraging a closed-loop mechanism of internal audits and customer feedback, combined with data analysis and continuous improvement measures, Seraphim continuously optimizes product quality management, ensuring quality control at every stage and consistently enhancing customer satisfaction. This approach provides a solid foundation for achieving long-term sustainable development.



Process	Management Measures
01 Market Analysis	Collect market demand to support product quality planning; Benchmark against market and customer needs to provide references for product design and quality standards; Collect feedback from customers regarding their quality expectations and suggestions to assist in quality improvement.
02 Design and Development	Establish product design standards and quality requirements; Conduct technical feasibility assessments and quality testing of new materials; Laboratory testing supports product development and compliance certification; Ensure products meet quality objectives through reliability testing.
03 Production Management	Develop and execute quality control standards and operational norms for the production process; Promote yield target improvements and process optimization; Conduct process monitoring and handle exceptions; Maintain and calibrate equipment to ensure product consistency; Implement comprehensive production quality management to ensure stable quality in key processes.
04 Product Delivery	Ensure product packaging, labeling, and quality records are complete; Implement finished product quality inspections to ensure delivered products meet acceptance standards; Collect and analyze delivery issues to provide a basis for continuous improvement.
05 Customer Service	Establish a mechanism for handling customer feedback and complaints; Organize customer satisfaction surveys and analyze for improvements; Coordinate customer acceptance work to ensure delivered quality meets customer requirements; Continuously track customer quality experiences to drive improvements in products and services.
06 Quality Improvement	Continuously optimize the ISO 9001 quality management system; Organize internal audits and management reviews to ensure the system operates effectively; Monitor various data comprehensively to drive product quality improvements.

In September 2023, Seraph celebrated its seventh annual "Quality Month" with the theme "Customer-Centric, Quality Assured." This event, organized by the Group's Quality Service Center and held at all locations, focused on raising quality awareness among employees and improving product management practices. Activities included quality slogan contests, innovative proposal submissions, knowledge competitions, and skill-based contests, all designed to cultivate an environment where everyone appreciates the importance of quality. Through this initiative, Seraph reinforced its commitment to customer-focused quality management, encouraged all employees to participate actively, and worked towards enhancing product quality and customer satisfaction. Ultimately, this effort laid a strong foundation for the company's long-term success

Management by Objective

At the end of each year, the management representative organizes various functional departments to establish the overall quality objectives. The Compliance Department then develops a management plan based on these objectives, covering multiple aspects, which is subsequently approved. During implementation, leaders at all levels provide necessary resources, while the functional departments are responsible for execution and inspection. The Compliance Department compiles monthly reports on the progress. If objectives are not met, the responsible departments take corrective actions. An annual management review meeting is held to evaluate these objectives. In cases of changes in quality policies, production activities, regulations, or failure to meet objectives, timely reviews and modifications are made to ensure the objectives remain appropriate and effective.

Process Control

Seraphim has implemented systematic and rigorous management measures in the quality control process of our products. We have achieved comprehensive coverage from production planning, personnel qualifications, equipment inspection to material control. Every employee is certified after professional training to ensure standardized operations. We also employ a multi-level inspection mechanism to ensure that each stage meets stringent quality standards. Additionally, we have established a robust traceability system, utilizing barcodes and reverse traceability links to achieve transparent management of product information. These control measures have effectively enhanced product quality, earning the trust of our customers.

Step	Control Measures	Details
Planning and Preparation	Production Planning	After contract approval, Seraphim's planning department formulates detailed production plans based on sales orders and notifies relevant departments such as production, procurement, and engineering to ensure timely preparation of production materials.
	Personnel Qualification Management	All workers must complete professional skills training and pass assessments before being allowed to work. Management allocates personnel based on employee attendance and ensures that workers are certified and qualified for their roles.
	Equipment Pre-Check	Before starting production, all equipment undergoes a pre-check to confirm operational status. Operators must adhere to equipment operation manuals during production to ensure correct operation and maintenance.
Material Control	Pre-Use Verification	Workers must verify material information before use to ensure it meets production requirements.
	Exception Handling Process	If material abnormalities are detected, workers must promptly notify inspection and engineering personnel for confirmation. If materials are insufficient, a replenishment request must be submitted. workers are also responsible for managing changes to production plans and returning surplus materials in a timely manner.
Process and Environment Control	Process Supervision	Workers must follow production process requirements and can suggest process improvements, which are evaluated and approved by engineering personnel.
	Environmental Condition Adaptation	Seraphim ensures that production environments meet product requirements, including appropriate temperature, humidity, and lighting. Any anomalies must be reported promptly.
Monitoring and Inspection	Raw Material Inspection	Upon delivery, purchased raw materials are verified for quantity, packaging, and labeling to ensure compliance with standards before inspection.
	Process Inspection Mechanism	First article inspection are conducted at critical points (e.g., shift changes, order transitions). Routine inspections are strictly executed, and inspectors have the authority to stop production lines if batch issues are found.
	Measurement Equipment Control	Monitoring and measurement equipment management is conducted according to relevant control procedures to ensure accurate and reliable measurements.

Step	Control Measures	Details
Protection and Traceability	Product Protection Measures	Packaging requirements for finished products are established, and quality assurance contracts are signed with carriers to safeguard product quality.
	Traceability System Development	A robust traceability system is in place to ensure quick access to product production and incoming material information when needed, enhancing accountability.
Emergency and Communication	Exception Emergency Handling	Non-conforming products are managed according to established procedures to ensure timely processing of defective goods. In the event of significant issues, production is halted, and multiple departments are coordinated to resolve the problems.
	Cross-units Communication and Coordination	Communication and coordination between departments are strengthened through emails, phone calls, or meetings to facilitate information flow and problem resolution.
Special Process Management	Special Process Control	Specific control procedures are implemented for special processes, ensuring these processes remain under strict supervision to avoid the creation of non-conforming products.
Identification Management	Product and Status Identification	Through the use of barcodes, process cards, and other identification methods, Seraphim ensures that the identity of products and materials is clear, and their statuses (such as pending inspection, qualified, or non-conforming) are distinctly marked.

Management of Nonconforming Products

Seraphim, in accordance with the Nonconforming Product Management and Control Procedure, swiftly and systematically addresses nonconforming products. By establishing a communication platform for quality anomaly handling, we ensure a comprehensive evaluation of nonconforming products, leading to a prompt and reasonable determination of quality defects. We promptly label, isolate, and record nonconforming products, provide feedback, and communicate quality anomaly information. We organize quality review meetings to identify responsible departments and develop improvement plans. Additionally, we employ various handling methods such as rework, downgrading, concession acceptance, scrapping, return and replacement, recall, and negotiation to mitigate quality risks, reduce economic losses, and ensure the delivery of high-quality products and services to our customers.

Innovation

Seraphim has always been committed to technology-driven innovation. As early as 2013, we established a dedicated R&D and testing laboratory, achieving multiple global certifications. By the end of 2023, Seraphim held 106 technology patents, including 7 new ones added this year. These patents focus on cutting-edge technologies in the photovoltaic industry, such as multi-busbar, half-cell, and large-size modules, which provide a strong foundation for our technological advancement and competitiveness in the market.

In 2023, we made significant strides in the research, development, and mass production of photovoltaic modules. By leveraging advanced technologies, we successfully developed and began mass production of the TOPCon 182 cell module. We also launched a half-cell module with anti-glare features, offering safer and more reliable solutions for specialized photovoltaic applications.

Throughout our innovation process, Seraphim places a strong emphasis on both quality and technology. Each new product is backed by rigorous quality testing and smart production control, ensuring high standards from R&D to mass production. These innovations not only enhance the competitiveness of our products but also provide customers with a wider variety of high-quality options, highlighting Seraphim's leadership in the photovoltaic industry.

The product breakthroughs in 2023 are as follows:

- Development and mass production of 182mm half-cell module-156 pcs type
- Development and mass production of TOPCon 182-cell modules
- Development and mass production of anti-glare half-cell modules

Reliable

As lean production concepts continue to evolve, Seraphim is committed to integrating standardization into every aspect of its manufacturing processes. This approach ensures high product quality and manufacturing stability. In the realm of component manufacturing, Seraphim has innovatively adopted intelligent and digital technologies, establishing a comprehensive intelligent control system that monitors over 300 quality checkpoints.

Throughout the production process, each component undergoes EL testing at three crucial stages. Additionally, Seraphim implements 100% HALM performance testing and random sampling inspections, which contribute to a standardized quality management system. Furthermore, all 4 series of Seraphim's photovoltaic modules have successfully received certification under IEC 61215 and IEC 61730 standards.

Digitalization

Seraphim focuses on smart manufacturing at its core, having implemented comprehensive digital management that spans research and development, manufacturing, testing, and delivery. By leveraging intelligent equipment such as high-speed string welders, fully automated layout machines, and dual-chamber laminators, Seraphim has successfully achieved automation and data integration across the entire production process. Our self-developed ERP system further enhances the traceability of components, from raw material procurement to production, testing, and delivery, significantly boosting production efficiency and quality consistency.

In 2023, Seraphim Jiangsu was awarded the title of Smart Factory of Changzhou, and received AA-level certification in the integration management system of information technology and industrialization, marking a significant advancement in our smart manufacturing and digital transformation efforts.

Additionally, we are applying digital intelligence to support our transition towards a greener, low-carbon framework. By utilizing digital twin technology, we enhance energy consumption monitoring for our equipment, enabling us to optimize operational methods and improve equipment efficiency. Seraphim Anhui has also been recognized with the titles of 2023 Green Factory of Anhui Province and 2023 Smart Factory and Digital Workshop of Anhui Province.

07

We and our customers

We and our customers >>>

Continuous Communication

Pre-Sales

Utilize exhibitions, online platforms, and other methods to introduce products and relevant company information to customers, providing them the opportunity to understand both the products and the company.

Gather customer needs and their requirements regarding product quality and service in order to offer the most suitable product solutions.

Sales

Ensure timely confirmation of product requirements and the effective execution of contracts/orders, ensuring that customers receive products that meet their specifications, thereby increasing customer trust.

Select appropriate transportation methods to deliver products to customers promptly and accurately.

Post-Sales

Regularly collect and compile customer feedback and suggestions, coordinating with various departments to analyze, communicate, and resolve issues.

Monitor the fulfillment of customer needs, as well as the quality and service of products during the delivery process, and continuously improve based on this feedback.

Customer satisfaction

Seraphim conducts a satisfaction survey for key customers every June and December. After finalizing the list of customers, we promptly send out the Customer Satisfaction Survey. This survey primarily assesses several dimensions: product quality, pricing, pre-sale service, delivery, and after-sale service.

Once we receive the feedback from the surveys, the marketing department compiles the responses and analyzes the results. If any customer's satisfaction level falls below the target value, sales personnel will investigate the reasons behind this dissatisfaction. If necessary, they will request related departments to propose corrective actions and will monitor the effectiveness of these measures.

Complaint Handling and Resolution

Process Stage	Specific Process
Receiving and Initial Response	Sales personnel receive the customer's Customer Complaint Registration Form and provide a preliminary response within 24 hours; if necessary, they may communicate via phone first.
Information Tracking	Customer service confirms the complaint information, records the nature and severity of the complaint, and issues a quality alert to the responsible departments; recurring complaints are reported to management.
Production Information Inquiry	Customer service checks the production workshop based on component information and sends relevant information (like component images and complaint descriptions) to the department head, coordinating to investigate the component's factory data.
Review and Root Cause Analysis	Customer service summarizes production feedback, convenes relevant departments for a review, determines the responsibility for the issue, and analyzes the cause to find evidence. For recurring issues, they may communicate via email instead of holding a meeting.
Developing Measures	The responsible department analyzes the cause and identifies the problem point, then develops corrective and preventive measures, creating a Corrective Action Record or 8D Report.
Verification of Measures and Confirmation of Effects	The responsible department verifies the effectiveness of the implemented measures; once confirmed as effective, the final report is completed, and training is provided to employees if necessary, with updates to relevant documents.
Responding to Customers	Within 5 working days, customer service prepares the final 8D Report or the required format based on relevant records and replies to the customer; after receiving confirmation, they notify relevant departments for dissemination.
Closure and Archiving	Complaints are resolved within 30 days from the date of receipt, and all related documents are archived, organized by complaint type and severity, while continuously monitoring the complaint rate.

This year, Seraphim has not experienced any incidents of customer privacy leakage and has not received any related complaints.

08

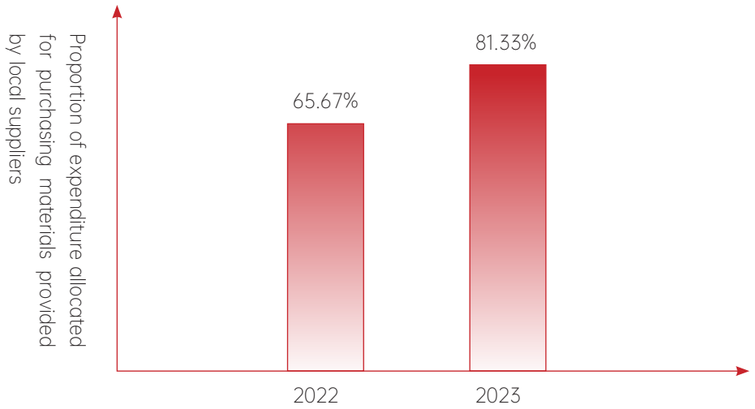
We and our supply chain

We and our supply chain >>>

Security and safety

Currently, Seraphim has approximately 40 major suppliers and about 60 secondary suppliers. The company adheres to the principles of localizing and optimizing the supply chain by actively promoting collaborative development through the establishment of new raw material suppliers. We encourage suppliers to set up factories around our production bases to shorten the transportation distance of raw materials, thereby enhancing logistics efficiency and supply chain resilience.

In 2023, the expenditure proportion for purchasing materials from local suppliers reached 81.33%, an increase of 15.66% compared to 2022. Through close cooperation with suppliers, the company has further strengthened the reliability of the supply chain, providing strong support for the stable supply of high-quality products.



Notes: Local suppliers refer to suppliers who produce in the province where the our production base is located.

Supply chain engagement

Seraphim views supply chain management as a key component in achieving sustainable development. We are committed to working with suppliers to build a green, compliant, and harmonious collaborative ecosystem. From proposing cooperation requirements to establishing an audit system and organizing professional training, Seraphim is taking various actions to create a responsible supply chain, laying a solid foundation for the long-term development of the enterprise.

Behavior Norms

Seraphim requires all suppliers to comply with the Supplier Code of Conduct, which includes obtaining necessary environmental permits (for example, high-pollution enterprises must obtain pollution discharge permits), adhering to environmental protection requirements (such as RoHS, REACH, etc.), implementing effective measures to reduce pollutant emissions, and actively promoting energy conservation and emission reduction. To strengthen the management of business ethics, the company mandates that suppliers eliminate corrupt practices, respect intellectual property, and ensure fair trading.

Seraphim requires all suppliers to sign the Supplier Social Responsibility Commitment, pledging to comply with relevant social responsibility requirements. In 2023, the signing rate for the Supplier Social Responsibility Commitment reached **100**%.

In addition, Seraphim issues the Notification of Environmental/Health Safety/Ethical Management Requirements for Relevant Parties to suppliers every year, reminding them to adhere to related requirements concerning environmental safety, personnel health, hazardous materials management, and labor rights protection. In 2023, we issued a total of **86** notifications, achieving a **100**% issuance rate.

Supplier audit system

We implement a supplier audit system for both new and existing suppliers. First, we use the Supplier Audit Form to assess each supplier, covering various aspects such as design, quality control, supplier management, customer service, manufacturing processes, as well as environmental, occupational health, and social responsibility. Following this, we conduct on-site audits of the suppliers. Through these on-site audits, we will determine the effectiveness of the suppliers' management and performance in areas such as wastewater, waste gas, and waste residue treatment, occupational health and safety, and labor rights protection. If a supplier is found to be non-compliant, the company will set a deadline for rectification and follow up on the effectiveness of the corrections through on-site inspections.

In 2023, the company conducted supply chain audits on 67 suppliers and found no actions within the suppliers or supply chain that posed significant actual or potential negative impacts on the environment or society. All primary material suppliers submitted RoHS test reports that met the requirements of the RoHS 2.0 Directive.

Training

Every year, we provide CSR training to our suppliers to enhance their capacity for environmental and social responsibility management. In 2023, a total of 82 suppliers participated in the CSR training.

CSR training for suppliers

ESG datasheet >>>

Indicator		Unit	2023
Economics			
Operating revenue		billion CNY	3.373
Subsidy		million CNY	4.3217
R&D			
Number of R&D personnel		person	211
Proportion of R&D personnel		%	16.2
Number of Technology Patents		items	106
R&D expenditure		million CNY	123.97
Environment			
Greenhouse Gas Emissions (Scope 1)		tCO_2e	1,933
Greenhouse Gas Emissions (Scope 2)		tCO_2e	27,578
Greenhouse Gas Emissions (Total)		tCO_2e	29,551
Emission intensity		tCO_2e /revenue in millions of CNY	8.76
Water Consumption		tons	182,469
Intensity of water consumption		tons/revenue in millions of CNY	54.09
Hazardous Waste		tons	6.52
Hazardous Waste Generation	Waste flux	tons	2.10
	Waste activated carbon	tons	1.79
	Waste oil	tons	1.92
	Xylene waste liquid	tons	0.27
	Empty flux containers	tons	0.44
Waste Recycling Volume	Plastic buckets	%	43.02
	Empty flux containers	%	78.55
	Pallets	%	47.15
Natural Gas		cubic meters	49,450
Gasoline		tons	60.24
Diesel		tons	34.57
Total Purchased Electricity		MWh	49,687.28
Total Electricity Consumption		MWh	51,756.756
Supply chain			
Number of suppliers identified as having significant actual and potential negative environmental impacts		/	0

Indicator		Unit	2023
Number of suppliers identified as having significant actual and potential negative social impacts		/	0
Supplier Social Responsibility Commitment Signing Rate		%	100
Notice on Environmental/Health and safety/ethics management requirements of relevant parties		%	100
Number of Suppliers Participating in CSR Training		/	82
Quality			
Average of Customer Satisfaction		%	95.85
Customer Complaint Resolution Rate		%	100
Product Pass Rate		%	100
On-time Order Delivery Rate		%	100
Health and safety impacts of products and services		/	0
Number of breaches of customer privacy		/	0
Number of complaints related to violations of customer privacy		/	0
Employees			
Total Number of Employees		/	1,284
in Gender	Male	/	740
	Female	/	544
in Regions	Jiangsu	/	415
	Anhui	/	827
	Shanghai	/	2
	Jiangxi	/	6
	Overseas	/	34
Total Number of Newcomers		/	415
in Gender	Male	/	321
	Female	/	94
in Regions	Overseas	/	11
	Chian	/	404
Labor contract signing rate		%	100
Return rate of employees on parental leave	Male	%	100
	Female	%	100
Retention rate of employees on parental leave	Male	%	87.5
	Female	%	100

Indicator		Unit	2023
Average Training Hours per Employee		hours	84
Average Training Hours per male Employee		hours	84
Average Training Hours per female Employee		hours	84
The ratio of the annual total compensation for the organization's highest-paid individual to the median annual total compensation for all employees (excluding the highest-paid individual)		/	9.5:1
The ratio of the percentage increase in annual total compensation for the organization's highest-paid individual to the median percentage increase in annual total compensation for all employees (excluding the highest-paid individual)		/	2:1
Occupational Health and Safety			
Health Check Completion Rate		%	100
Employee Safety Training Completion Rate		%	100
Number of Fatalities from Work Injuries		/	0
Accident Rate per Million Work Hours		/	2.2
Major Production Safety Incidents		/	0
Governance			
Total board members		/	7
Total number of supervisory board members		/	3
Total number of senior management employees		/	27
Senior management (in gender)	Male	%	81.5
	Female	%	18.5
Number of incidents of discrimination		/	0
Integrity Self-Discipline Commitment Signing Rate		%	100
Corruption Incidents		cases	0
Complaints Related to Corruption		cases	0
Human Rights Incidents		cases	0
Complaints Related to Human Rights		cases	0
Total Charitable Donations		thousand CNY	250

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Feedback >>>

Dear Reader,

Thank you for reading the 2023 Environmental, Social, and Governance Report of Seraphim Energy Group Co., Ltd. We sincerely welcome your feedback and ideas to help us continuously improve our reporting and enhance our sustainability performance. We encourage you to share your valuable suggestions with us through various means: by mail, email, fax, or by calling us directly.

1. What category of stakeholder does your organization belong to in relation to Seraphim?

☐ Shareholder ☐ Employee ☐ Supplier ☐ Customer ☐ Government

☐ Community/Public ☐ Bank ☐ Peer Company ☐ Industry Association/NGO

☐ Other (Please specify) _____

2. Overall, how would you rate our report?

☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Very Poor

3. How would you rate our report based on following aspects:

Information disclosure : ☐ Very good ☐ Relatively good ☐ Average ☐ Relatively poor ☐ Very poor

Layout design : ☐ Very good ☐ Relatively good ☐ Average ☐ Relatively poor ☐ Very poor

Readability : ☐ Very good ☐ Relatively good ☐ Average ☐ Relatively poor ☐ Very poor

4. Which part of this report are you most interested in?

_____

_____

5. What suggestions do you have for improving our future Environmental, Social and Governance reports?

_____

_____