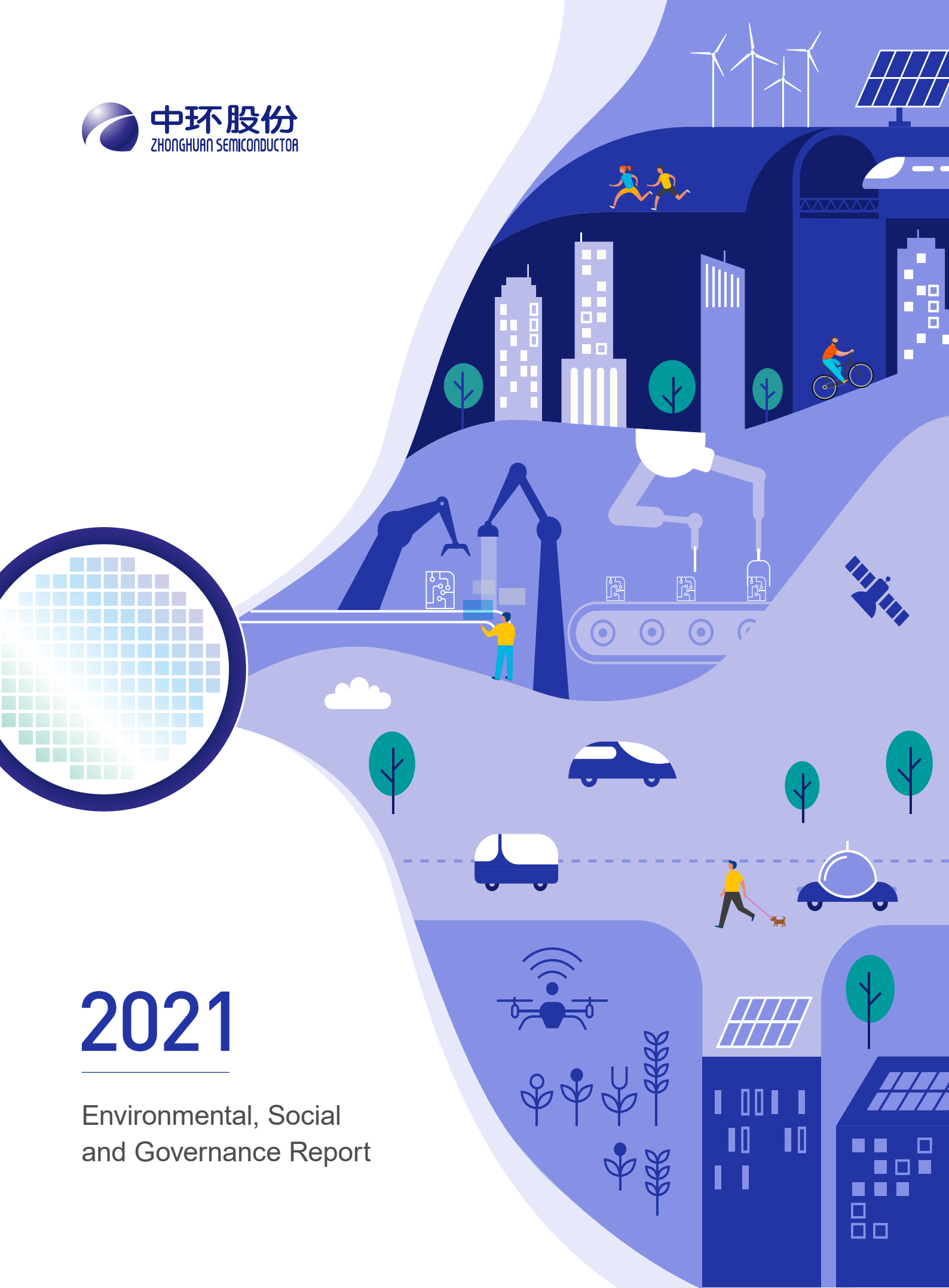
中环股份
ZHONGHUAN SEMICONDUCTOR



2021

Environmental, Social and Governance Report

CONTENTS

About Zhonghuan Semiconductor

Tianjin Zhonghuan Semiconductor Co., Ltd. (hereinafter referred to as "Zhonghuan Semiconductor" or the "Company", Stock Code 002129) is a company integrating scientific research, production, operation and venture capital investment in the semiconductor material industry and the new energy photovoltaic industry, which has been listed in Shenzhen Stock Exchange. The Company has ten high-tech subsidiaries, six R&D centers at provincial and ministerial levels, one post-doctoral research station, and staffs over 10,000 employees.

Focusing on the "green, low-carbon and sustainable development", the Company practices the concept of automatic, intelligent and smart manufacturing, and advances innovation in technology and product specification constantly in semiconductor material and new energy photovoltaic industries with a view to giving back to shareholders and society while propelling its own rapid development and the overall progress of the industry. Its products are widely applied in industries such as integrated circuits, consumer electronics, grid transmission, wind power generation, rail transportation, new energy vehicles, 5G, artificial intelligence, photovoltaic power generation and industrial control.

© General Information of Zhonghuan Semiconductor

Chinese Corporate Name	天津中环半导体股份有限公司
English Corporate Name	Tianjin Zhonghuan Semiconductor Co., Ltd.
Major Business Lines	Semiconductor materials, new energy photovoltaic silicon wafers, photovoltaic cells and components
Headquarters	No. 12 East Haitai Road, Huayuan Industrial Zone (Huanwai), Hi-tech Industrial Park, Tianjin
Main operating locations of the company and its subsidiaries	Tianjin Municipality, Inner Mongolia Autonomous Region, Jiangsu Province, Ningxia Autonomous Region
Ownership and Legal Form	Listed on Shenzhen Stock Exchange (Stock Code 002129)
Organization Size	13,371 employees
Membership of the Association	China Association for Public Companies, China Photovotaic Industry Association(Executive Director), China Semiconductor Industry Association, China Electronics Materials Industry Association, Tianjin New Energy Association

Social Recognition and Honors

Award	Awarder
Forbes, 2021 The China's Most Innovative Company	Forbes Media Group
Forbes, 2021 The China's Most Sustainable Employer	Forbes Media Group
2021 Top 500 Chinese Brand Influencers	China Enterprise News Group and the Organizing Committee of Releasing China Brand Influence Evaluation Results
Top 50 Enterprises in China's Electronic Materials Industry	China Electronics Materials Industry Association
Top 10 Professional Suppliers of Semiconductor Materials	China Electronics Materials Industry Association
Enterprise with Standard Conditions in the Photovoltaic Manufacturing Industry	Department of Electronic Information under the Ministry of Industry and Information Technology
2021 Top 500 Chinese ESG Excellence Enterprises	Sina Finance
The Second Batch of Intelligent Photovoltaic Pilot Demonstration Enterprises	Department of Electronic Information under the Ministry of Industry and Information Technology
Industrial Internet Benchmark Factory Project	Industry and Information Technology Department of Jiangsu
Intelligent Manufacturing Demonstration Factory Project	Industry and Information Technology Department of Jiangsu
2020 PVBL Top 20 Module Brand with the Most Value	Photovoltaic Brand Lab (PVBL)
National High-tech Enterprise	Tianjin Municipal Science and Technology Bureau, Jiangsu Provincial Department of Science and Technology/Department of Finance of Jiangsu Province/Jiangsu Provincial Tax Service
Enterprise with Specification Announcement in the Photovoltaic Manufacturing Industry	Department of Electronic Information under the Ministry of Industry and Information Technology
Tianjin Leading Cultivation Enterprise in Science and Technology	Tianjin Municipal Science and Technology Bureau
Tianjin New Little Giant with Professional, Proficient and Special Features	Tianjin Industrial and Information Technology Bureau
2021 Leading Enterprise in Wuxi Key Industrial Clusters	Wuxi Bureau of Industry and Information Technology
Municipal Enterprise R&D Center	Hohhot Bureau of Science and Technology
2021 High-tech Enterprise Selected for Cultivation	Wuxi Bureau of Science and Technology
Hohhot Enterprise R&D Center	Hohhot Bureau of Science and Technology

Environmental, Social and Governance System

The Company pursues the corporate vision of " Environmental friendliness, Employee support, Social respect and Customer trust ", and practices reform to bring work and life with more dignity to all employees and stakeholders.

Integrating environmental and social responsibilities into strategic business activities, the Company prudently manages environmental and social risks, improves the management system, strengthens supply chain management, reduces resource consumption and environmental emissions, facilitates innovation-driven development and cultivates innovative talents to contribute to global progress.

Social Responsibility Management System

Effective social responsibility management is attributed to the emphasis by the senior management and the establishment of a governance system. The Company has built a social responsibility management system that is involved by the management, is coordinated among functional departments horizontally, and covers subsidiaries vertically. And the working team of the system is composed of the heads of functional departments.

© Social Responsibility Management Framework of Zhonghuan Semiconductor

Concerns	Eco-environment-E	Social responsibility-S	Corporate governance-G
Responsible departments	Project Management Department, Strategic Planning Department, Compliance Management Department, R&D Center and Production Department	Organization Development Department and Party-Mass Service Department	Board of Directors and Senior Management
Items to be managed	• Managing environmental risks in the whole value chain • Producing products that are more resource-intensive with less pollution	• Prompting employee growth • Facilitating innovation and customer satisfaction • Supporting community prosperity	• Proposing the sustainable development vision of the Company • Developing a social responsibility plan of the Company • Disclosing goals and management progress information
Goal to be pursued	The common development of economy, environment and society		

Communication with Stakeholders and Analysis of Material Topics

According to industrial features and operating characteristics of the Company, and benchmarking the experience and practice of the industry at home and abroad, the Company identifies shareholders, customers, employees, governments and regulatory agencies, partners, communities and the public as major stakeholders, and actively communicates with them through such channels and modes as the website, media, meetings, reports and activities.

© Main Stakeholders of Zhonghuan Semiconductor and Major Modes of Communication with Them

Key stakeholders	Topics of concern	Communication and response
Shareholders and senior management	Performance appraisal of executives, industry development, protection of investor rights and interests, anti-corruption	General Meeting of Shareholders, financial reports, performance reports, road shows, etc.
Customers	Customer service, product quality, R&D and innovation	Product exhibitions, customer surveys, technical seminars, B2B (e.g., E-tapeout system, WIP report and WAT report), customer service hotlines, customer satisfaction surveys, etc.
Employees	Employee recruitment, talent training, employee retention and safety production	Employee activities, employees' congress, corporate intranet, employee training, employee self-service system, employee handbook, internal corporate publications, etc.
Governments and regulatory agencies	Compliance management, emissions management, environmental management and use of water resource	Inspections, correspondences, policy implementation, information disclosure, etc.
Partners	Industrial development and green products	Public bidding meetings, strategic cooperation negotiations, exchanges and mutual visits, etc.
Communities, the public and media	Community development, social welfare and rural revitalization	Volunteer activities in communities, social welfare projects, targeted poverty alleviation and projects supporting other social undertakings

In 2021, the Company fulfilled inspections specific to social responsibility topics according to the *Sustainability Reporting Standards* (GRI Standards), domestic and international policies and standards, and considering the focuses of internal and external stakeholders, peer benchmarking analysis results, industrial features, and strategic directions.

Following the procedures of identification, evaluation and selection, the Company, cooperating with professionals, defined 20 social responsibility topics with strong materiality as the focuses of its actions and reports, and prioritized these 20 topics by the current urgency.

In 2021, in order to better cater to the development needs of the industry, the Company strengthened compliance management to ensure the orderly business development and the return on investment of investors. In line with the new *Work Safety Law of the People's Republic of China*, the Company launched an information management platform for safety production, and built a dual prevention mechanism of managing and controlling safety risks by levels and identifying and tackling potential hazards to fulfill safety responsibility for all employees. Following low-carbon development, the Company stepped up carbon emission inspection and more accurate disclosure to facilitate the construction of green factories. Moreover, the Company actively expanded the achievements of poverty alleviation and responded to the call for rural revitalization to serve the prosperity and harmonious development of society continuously.

◎ Table for Analysis of ESG Material Topics of Zhonghuan Semiconductor in 2021

Stakeholders/urgency	Low	Middle	High
Investors	Industrial development	Performance appraisal of executives Anti-corruption	Protection of investor rights and interests Compliance management
Customers	Customer service	Product quality	R&D and innovation
Employees	Employee recruitment	Talent cultivation	Employee retention Safety production
Environment	Environmental management	Waste management	Green products Use of water resource Carbon emission management
Society	Social welfare	Community development	Rural revitalization

Facilitating Low-carbon Transformation

[Topic] Actively Responding to Climate Change

Climate change mitigation and adaptation has become one of the most pressing issues of the 21st century. Global warming continues to increase the frequency of extreme weather events and is bringing about new policy changes globally, driving technological innovation and progress across industries, and influencing a shift in green thinking among consumers and investors. Mitigating climate change is important for companies themselves and for the world. To this end, the company is identifying its own climate change risks and opportunities, improving energy efficiency in its production processes to achieve energy savings and reduce emissions, while also contributing to the goals of " emissions peak and carbon neutrality ".

Identifying Climate Change Risks and Opportunities

Global climate change not only results in various extreme weather phenomena, but also affects economic and social activities seriously. Paying attention to global climate change trends, the Company has identified risks and opportunities of climate change referring to the recommendations proposed by the Task Force on Climate-related Financial Disclosures (TCFD) under the Financial Stability Board (FSB), and improved management according to identification results to minimize carbon footprint generated in production and operation activities.

Governance	• The Company takes topics concerning climate change mitigation and adaptation as its ESG focuses. • The Board of Directors reviews climate and energy policies, and annually deliberates the analysis and quantitative performance disclosure of climate change topics in the *Environmental, Social and Governance Report* of the Company. • The General Manager reviews and analyzes the climate change-related affairs of the Company regularly, summarizes the low-carbon development trend and reports the trend to the Board of Directors, and arranges guidance and resources required by relevant topics to the environmental management department of the Company. • Multiple departments of the Company work together, forming a proper organization for managing climate change topics.
Strategy	• The Company identifies and analyzes major climate-related risks and opportunities, and evaluates their potential impact on its operation and finance. • Business units take management actions in terms of low-carbon operation, response to climate change and natural disasters, and support for clean energy development.
Risk management	• The Company identifies potential risks and opportunities in its business and operational activities referring to the TCFD risk analysis framework. • The Company identifies and defines the materiality of risks and opportunities based on their probability of occurrence and severity of impact. • The Company works out measures for elimination, mitigation, transfer or control of different types of risks and opportunities.
Performance and goals	• The Company collects data related to greenhouse gases emission activities regularly every year, makes peer benchmarking and inter-annual comparison, and discloses results in the ESG Report to evaluate its climate change management performance and formulate improvement plans.

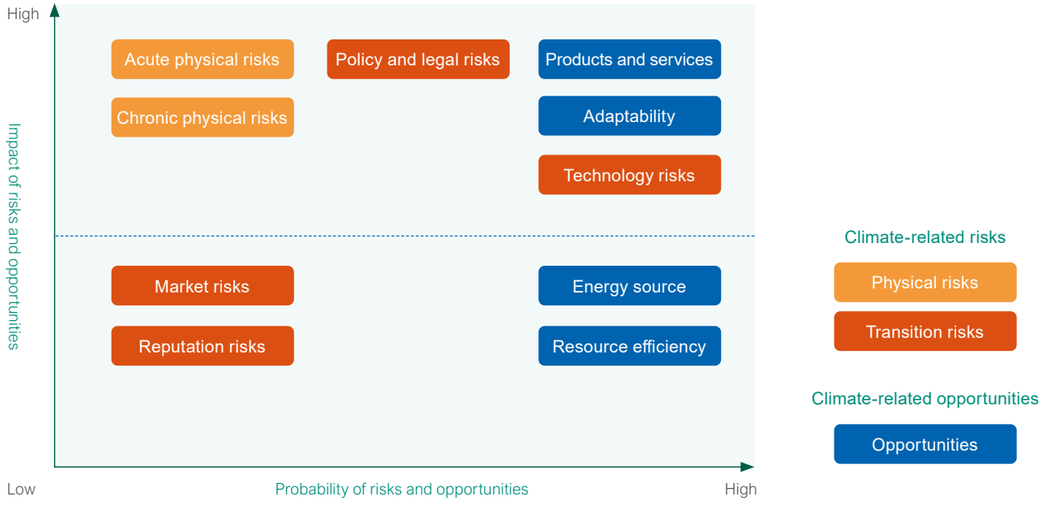
In order to better cope with potential risks and opportunities of climate change, the Company identifies the risks and opportunities of climate change related to its own operation through policy survey, peer benchmarking, and reference to expert opinions, and evaluates the impact of risks and opportunities on its financial situation.

◎ Analysis Process of Climate Change Risks and Opportunities

Identification	Evaluation	Analysis
• Identify climate change risks and opportunities related to the business and operation of the Company under the TCFD framework.	• Evaluate the impact of climate change risks and opportunities on the finance and strategy of the Company according to expert opinions.	• Analyze the level of impact and probability of occurrence of climate change risks and opportunities, and determine the priorities of risks and opportunities.

Climate change risks identified by the Company include three types of transition risks: policy and law risks, technical risks and market risks, and acute and chronic physical risks. Main opportunities include products and services, adaptability, energy source and resource efficiency.

◎ Identification Matrix of Climate Change Risks and Opportunities



Main risks of climate change identified			Measures
Risks	Transition risks	**Policy and legal risks** Increased compliance cost to meet regulatory requirements, or lawsuits and penalties if the Company fails to meet regulatory requirements in environmental management.	• Take climate change as a key topic which should be communicated with stakeholders through ESG reports and other channels. • Track applicable laws, regulations and policies every year, and make data statistics of greenhouse gas emissions every year to respond to policy requirements timely. • Observe national laws and regulations in corporate activities and throughout the process of products and services, strengthen source control, facilitate the construction of smart factories, implement clean production, develop green and environmentally-friendly products, make rational use of resources, dispose "waste water, exhaust gas and solid waste" responsibly, prevent and control pollution. • Manage energy and water consumption statistically every year, and implement energy-saving projects. • Work out response plans for environmental emergencies to improve the emergency response capacity of the Company.
		Technology risks Direct impact of technological advancement related to clean energy on the business and products of the Company as a clean energy solution provider under the influence of climate change.	
		Market risks Foreign customers raise requirements for sustainable development management and greenhouses gas emission management, as the Company develops business in both domestic and foreign markets. Therefore, the greenhouses gas management results of the Company affect the judgment and decision-making of customers when they engage in business with the Company.	
		Reputation risks With the transition to a low-carbon economy, stakeholders expect that the Company takes proactive management actions and improves information transparency when responding to climate change. If the Company fails to properly respond to these demands, its reputation will be impaired.	
	Physical risks	**Acute physical risks** Climate change is signaled by extreme weather conditions which become more severe and more frequent. The production bases of the Company in Tianjin, Wuxi, and Hohhot may be affected by typhoons, rainstorms, ice and snow accompanied by power outage and flood, which may cause safety production accidents or production suspension.	
		Chronic physical risks Climate change will lead to global warming and rising sea level so that the Company encounter a risk of shortage in water sources needed for production.	

Main opportunities of climate change identified			Measures
Opportunities	Opportunity types	Main descriptions	——
	Products and services	With favorable policies of carbon neutrality, the green and low-carbon products and solutions of the Company will be preferred by consumers better, meet the emerging needs of customers, and bring more room for performance growth.	• Continue to invest in R&D of green and low-carbon products, and develop energy-saving and environmentally-friendly products and solutions to help customers reduce their carbon footprint.
	Adaptability	The Company keeps investing in the development of low-carbon products and solutions, and works with suppliers and customers to build a green and low-carbon ecosystem in order to improve its adaptability to climate change.	
	Resource efficiency	The Company facilitates energy conservation and emission reduction by improving resource use efficiency to cut its operating cost.	
	Energy source	The Company replaces traditional high-carbon energy with clean energy and low-carbon energy to cut energy cost in the future.	

Source Identification of Greenhouse Gas Emissions

In 2021, the Company invited third-party organizations to conduct greenhouse gas emissions accounting 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*. According to the result, Scope 1 emission are mainly from fuel combustion, fugitive emissions and process emissions. Scope 2 emissions are mainly from purchased electricity, heating consumption, steam consumption and cooling consumption.

Greenhouse gas emissions (Scope 1)	Greenhouse gas emissions (Scope 2)
fuel combustion, fugitive emissions and process emissions	purchased electricity, heating consumption, steam consumption and cooling consumption

Energy Management

Responding to the national strategic goals of " emissions peak and carbon neutrality" actively, the Company analyzes the energy consumption structure of its production bases through carbon inventory. In 2021, the company conducted energy accounting in 10 new energy photovoltaic and semiconductor materials subsidiaries. According to the results of the accounting, electrical energy was the main source of energy at each production site, accounting for more than 95% of the overall energy use. Clean energy accounts for more than 2% of all energy use.

Based on the accurate analysis of energy consumption structure, the Company has implemented process improvement, equipment optimization and upgrading, new material R&D, and replacement of traditional materials with new ones in terms of production energy, innovating low-emission or no-emission technologies continuously in the production process. For power energy, all production bases, focusing on energy conservation in technology, management and structure, make improvements through waste heat recovery, use of natural resources for air conditioning and refrigeration, and equipment energy efficiency enhancement in order to reduce electricity consumption and carbon emissions.

◎ Key Energy Conservation Efforts and Achievements in 2021

Optimization of production energy consumption	Achievement
• Improve the process, upgrade silicon wafers to be thinner and bigger, and further thin diamond wire saws to improve the wafer output rate	4 million kWh electric saved throughout the year
• Upgrade production equipment	Electric power saved throughout the year 70,000 kWh

Optimization of energy consumption	Achievement
• Equip transformers with capacitor compensation cabinets additionally	5.17 million kWh electric saved throughout the year
• Make refrigeration free of charge: Upgrade piping systems, and adopt plate heat exchangers without power sources to enable refrigerators to short-circuit, leaving refrigerators to stop run	2.72 million kWh electric saved throughout the year
• Conduct frequency conversion retrofit for water pumps, exhaust fans and refrigerators	1 million kWh electric saved throughout the year

Optimization of power energy consumption	Achievement
• Apply green energy and lay photovoltaic cells on roofs	610,000 kWh electric saved throughout the year
• Upgrade LED lamps	510,000 kWh electric saved throughout the year
• Enable automatic control	120,000 kWh electric saved throughout the year
• Apply green energy and lay photovoltaic cells on roofs	390,000 kWh electric saved throughout the year

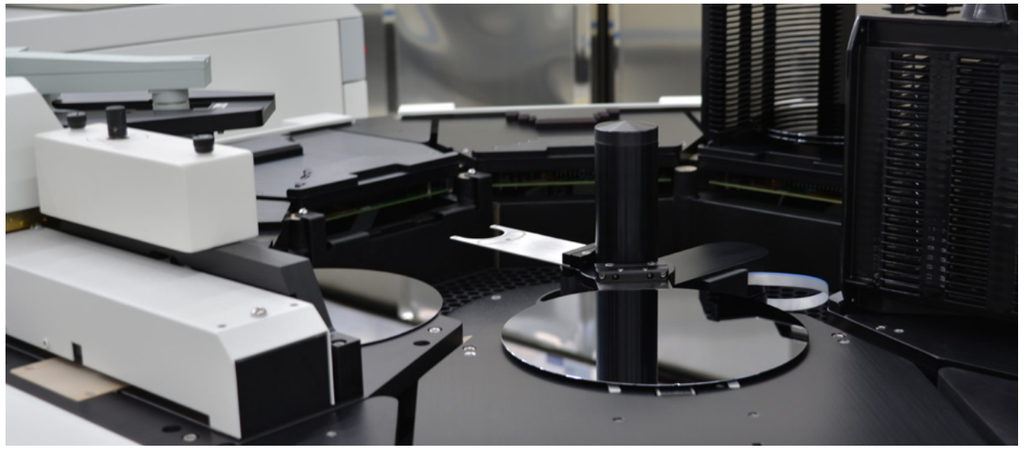
Tianjin Advanced Semiconductor Materials - Semiconductor Materials Business Unit: Take multiple measures, saving 2.67 million kWh electric power throughout the year

Green energy application: Install solar panels on the roof of existing workshops with installed capacity totaling 1.2 MW, generating 290,000 kWh renewable energy, a share of 10.9% of the total electric power consumption by buildings.

Automatic control: Optimize the control systems of PCW water pumps, which enables automatic control of PCW according to the actual demand, cutting electric power consumption by 120,000 kWh throughout the year.

LED lamp upgrade: Replace ordinary lamps in the workshops with energy-saving LED lamps, cutting electric power consumption by 170,000 kWh throughout the year.

Refrigeration free of charge: Take cooling water as a free cold source in winter to supply cooling water to equipment that needs cooling throughout the year, reducing the energy consumption of water chilling units in winter and cutting electric power consumption by 2.09 million kWh throughout the year.



Promoting green transformation through technological innovation

Driven by China's goals of carbon peaking by 2030 and carbon neutrality by 2060, and the Paris Agreement, the global energy structure is transforming from high-carbon fossil energy to green, low-carbon renewable energy. As an important part of renewable energy, photovoltaic power will be also taken as major energy by China in the future, embracing a sustained and rapid development stage. It will function as a strong impetus for the achievement of " emission peak " and "carbon neutrality". The Company is committed to realizing the rational price of photovoltaic power in global power grids by promoting the continuous reduction of photovoltaic power generation LCOE (levelized cost of energy) and the optimization of BOS cost based on technological innovation.

◎ Social Recognition and Honors in Technological Innovation

Awards	Awardees	Awarders
National Awards		
National High-tech Enterprise	Tianjin Huanzhi New Energy Technology Co., Ltd.	Tianjin Municipal Science and Technology Bureau,
Top 50 Enterprises in China's Electronic Materials Industry (The Second Place)	Zhonghuan Semiconductor	China Electronics Materials Industry Association
Top 10 Professional Suppliers of Semiconductor Materials (The Second Place)	Zhonghuan Semiconductor	China Electronics Materials Industry Association
National High-tech Enterprise	Zhonghuan Advanced Semiconductor Materials Co., Ltd.	Jiangsu Provincial Department of Science and Technology/Department of Finance of Jiangsu Province/Jiangsu Provincial Tax Service
Municipal Awards		
Hohhot Enterprise R&D Center	Zhonghuan GCL	Hohhot Bureau of Science and Technology
Municipal Enterprise R&D Center	Inner Mongolia Zhonghuan Advanced Semiconductor Materials Co., Ltd.	Hohhot Bureau of Science and Technology
2021 High-tech Enterprise Selected for Cultivation	Zhonghuan Advanced Semiconductor Materials Co., Ltd.	Wuxi Bureau of Science and Technology

Extreme Clean Energy Solution

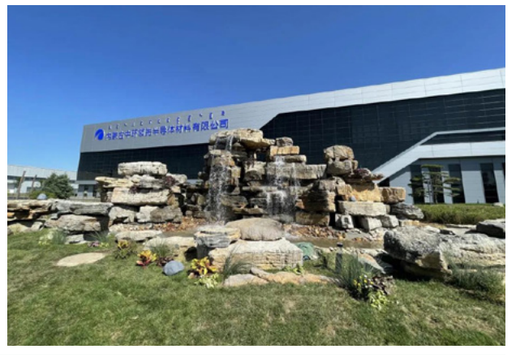
In 2021, amid the LCOE reduction and sustainable development in the photovoltaic industry, large-size and high-power products saw strong demands and popularity in the market. Seizing the opportunity of global clean energy development, the Company consolidated its product technology advantages, and enhanced its global competitiveness, with the development and integration of two major platforms of G12 large-size silicon wafer and efficient imbricated module technology as its focus.

Semiconductor Materials

Firmly adhering to the strategy of " Domestic leading, global catch-up ", the Company comprehensively benchmarking itself against advanced international manufacturers, continuously expanding its product lines, constructing a global marketing network in order to a "leading" brand in the global market. Zhonghuan Advanced Semiconductor Materials Co., Ltd. was awarded the 2021 Jiangsu Province Industrial and Information Industry Transformation and Upgrading Special Funds (Third Batch) Project by the Jiangsu Provincial Department of Industry and Information Technology and the Provincial Department of Finance, and the Zhonghuan Semiconductor Wafer Factory invested by Zhonghuan Advanced Semiconductor Materials Co., Ltd. was evaluated as the Industrial Internet Benchmark Factory Project.

In 2021, the 8-12-inch silicon wafer project of Company in Wuxi was put into production rapidly, consolidating its national industrial layout based on its manufacturing bases in Inner Mongolia, Tianjin, and Jiangsu. By the end of 2021, it achieved its set targets of the monthly production capacity of 750,000 8-inch wafers and 150,000 12-inch wafers.

Combining advantageous resources of Inner Mongolia, Tianjin and Jiangsu, Zhonghuan Semiconductor plans to manufacture semiconductor materials, and put the project into production by 2023, with expected monthly production capacity reaching **1.1** million silicon wafers sized **6**-inch or below, **1** million **8**-inch silicon wafers, and **700,000 12**-inch silicon wafers.

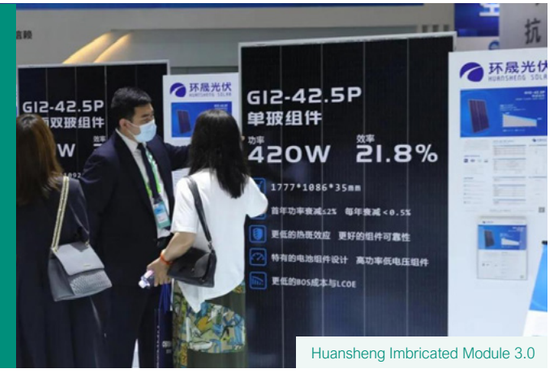


Industrial Bases of Zhonghuan Semiconductor Materials Co., Ltd. in Jiangsu, Tianjin and Inner Mongolia

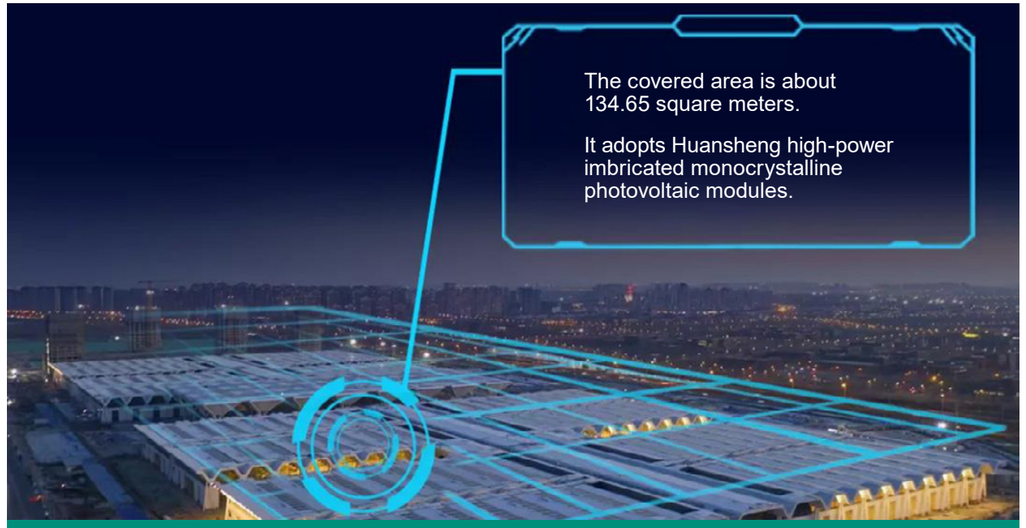
New Energy Photovoltaic Materials

In 2021, the photovoltaic industry chain saw intensified competition. As a leader in the new energy photovoltaic silicon wafer industry, the Company has cut costs and improved unit production efficiency through technological innovation. In the production of silicon wafers, the Company has advanced wafer thinning applications and enhanced the yield of Grade A silicon wafers significantly relying on advanced thinning and slice production experience and technology accumulation and cooperating with downstream customers. In the production of crystals, the Company has reduced the consumption rate of silicon materials per unit product by nearly 3% on year-on-year basis through a series of technological advancements, rising the utilization rate of silicon materials, and has eased the cost pressure of downstream customers relying on G12 differentiated product advantages.

G12 solar silicon wafer products are the world's first 210 mm G12 ultra-large solar monocrystalline silicon wafers (diameter: 295 mm, i.e., 12 in), with the area increased by 80.5% compared to that of conventional M2 products. As a result, the generated output per cell hits 10.01 W, nearly twice the power generated by conventional products. Additionally, efficient battery technology is adopted, which reduces LCOE by over 6%, and increases component power up to 600 W. The Company continues to facilitate the dual-platform technology application of "G12 + imbrication". G12 photovoltaic silicon wafers and imbrication products have become the key and effective products to realize the rational price of photovoltaic power in global power grids.



Huansheng Imbricated Module 3.0



The 7 MWp Roof Distributed Photovoltaic Power Project of National Exhibition and Convention Center (Phase I) was fully connected to the grid on January 30, 2021. The project fully adopts Huansheng high-power imbricated modules, and enables the annual average power generation capacity to reach 14.7284 million kWh, which saves 4,830.92 tons of standard coal and reduces coal dust emissions of 4,006.12 tons, carbon dioxide emissions of 14,684.22 tons, sulfur dioxide emissions of 441.85 tons, and nitrogen oxide emissions of 220.93 tons, equivalent to new 707.55 trees.

Stick to R&D and Innovation

Adhering to the business concept of "long-distance running" competition, the Company practices a new business mode of complementing advantages each other, cooperating with powerful partners and pursuing common development globally. Furthermore, it highly respects intellectual property around the world, strives to form an independent intellectual property system by actively promoting its independent innovation. To this end, it has launched intensive innovation, integrated innovation, joint innovation, collaborative innovation and other innovation activities in terms of technologies, products, and business activities, developing into an international company initially.

The Company has 1 national technology center, 6 provincial and ministerial R&D centers, 2 provincial and ministerial key laboratories, 10 high-tech subsidiaries, and 1 national technology innovation demonstration subsidiary. The Company has a R&D team with 1,000-odd members, including 2 with doctoral degree or above and 111 with master degree or above, a share of 11% of total technicians. In addition, it has employed several international expert teams and engineer teams.

The Company has always stressed cooperation among enterprises, universities and research institutes. It actively builds ties with universities and scientific research institutes in various forms, strengthens exchanges and cooperation with domestic and foreign counterparts, and effectively organizes and applies social resources to serve its own innovation and advance technological development and innovation of the industry.

© Enterprise-University-Research Institute Cooperation Programs

The Company cooperates with Shandong University on process optimization of "G12 large-sized silicon wafer" products.

- The two sides cooperate to implement analog simulation and set up a laboratory. The Company verifies the simulation results and optimizes the process according to the results acquired by optimizing parameters in simulation based on the field test results timely.

The Company cooperates with Hebei University of Technology on R&D of silicon crystal growth technology.

- The two sides cooperate to mainly study crystal growth, monocrystal defects, silicon wafer polishing, and silicon wafer testing technology,etc.

Protect Intellectual Property

The Company values the protection of intellectual property, strengthens the use of patent information, improves innovation, and actively applies for patents by establishing a full-time patent team, establishibng a patent management system, and working out effective work procedures. It also invests more fund and personnel in protecting intellectual property in order to enhance the quantity and quality of independent intellectual property, and form an effective patent layout on core technologies and basic products dominated by core patents for invention and based on utility model patents.

In order to ensure technological innovation, and lower or avoid intellectual property control risks, the Company focuses on the technological investment and process innovation of imbricated module products protected by intellectual property and supported by industry-leading technology when developing its photovoltaic module business. Also, it adopts G12 platform technology to maintain its leading position in the performance of differentiated products.

By December 31, 2021, the Company has had 975 authorized intellectual property items, including 154 patents for invention, 797 utility model patents, 1 design patent, 21 integrated circuit layout designs, and 2 software copyrights, and had 613 patents under application, including 475 patents for invention and 138 utility model patents.

Improve Quality Management

Referring to the international leading quality management concept, the Company has established a quality management system covering the whole customer service process in its production bases, and worked out quality control procedures considering five main factors affecting product quality, namely personnel, machines, raw materials, methods and environment to ensure quality control fully. By the end of 2021, the Company has passed ISO9001 quality management system certification for its ten subsidiaries including Zhonghuan Photovoltaic, Zhonghuan GCL, Zhonghuan Applied Materials, Huanou Semiconductor Materials Technology, Huanzhi New Energy Technology, Zhonghuan Advanced Semiconductor Materials, Huansheng Photovoltaic and Huansheng New Energy.

Enhance Customer Service Experience

Based on the corporate strategy of "developing into a global leader in semiconductor photovoltaic materials, and catching up and beyond strategy in semiconductor materials", the Company set up the Customer Quality Center in 2021. Focusing on customer quality service and product standard management, the Center conducts intensive quality management in the life cycle of products for a balance between internal/external quality and the manufacturing link in order to enhance product quality, speed up response to customers, and improve customer service quality and customer experience.

© Assignment of Responsibilities in the Customer Quality Center

Associate Quality Director

- Make product quality improvement
- Conduct product change management and control
- Plan product quality standards
- Decrease external customer complaints

Chief Engineer

- Identify product improvement directions
- Organize standard changes
- Provide technical support
- Formulate product shipment and internal control standards

Product Quality Manager

- Work out customer quality improvement plans
- Guide factories to prepare improvement measures
- Organize internal evaluation
- Hold quality analysis meetings
- Evaluate BU targets

Account Manager

- Communicate with customers regularly
- Communicate external customer information to the internal
- Conduct client-side data monitoring and communicate monitored results to the internal
- Track customer complaints in a closed loop

Standard Manager

- Review and file standard changes
- Optimize standards regularly
- Check the implementation of BU standards

Resident Engineer

- Identify and analyze product quality problems
- Collect customer quality data
- Maintain and develop customer relationship

In the process of customer quality service, the quality team of the Customer Quality Center, the responsible department of the factory and the sales team carry out a series of rapid responding measures such as internal closed-loop verification at the customer information platform according to customer complaints, entrusted survey feedback, customer quality agreements, special customer requirements and potential customer quality requirements identified. They work to respond to single and individual problems, and collect and tackle general quality problems to continuously enhance product quality. Moreover, the Company adjusts the quality management framework, delivers quality customer service before, in and after sales in the full cycle covering order, technical review, manufacturing supervision, on-site installation, and even safety training in order to improve customer service quality. Furthermore, the Company takes preventive actions to speed up response to customers and reduce customer complaint rate for better customer satisfaction. The results of return visits to customers in 2021 showed that customer satisfaction was higher than 90%.

Consolidate Internal Quality Management Competence

Focusing on the development strategy of "catching up and surpassing", the Company conducted quality management competitiveness analysis from multiple dimensions in 2021 to explore opportunities for improving the quality system, supply chain quality, process quality, customer service quality and reliability monitoring. With these efforts, the Company has developed and implemented a strict product standard management process in order to ensure continuous improvement and upgrade of product standards, acquire cutting-edge technology information and customer needs timely, and improve product quality and process control. In 2021, the Company developed standards for wafer and crystal products, and updated over 10 standards covering the full range of G12 products.

◎ Products Standard Management Process

Identification of customer needs, frontier policies, laws and regulations, and introduction of new technologies

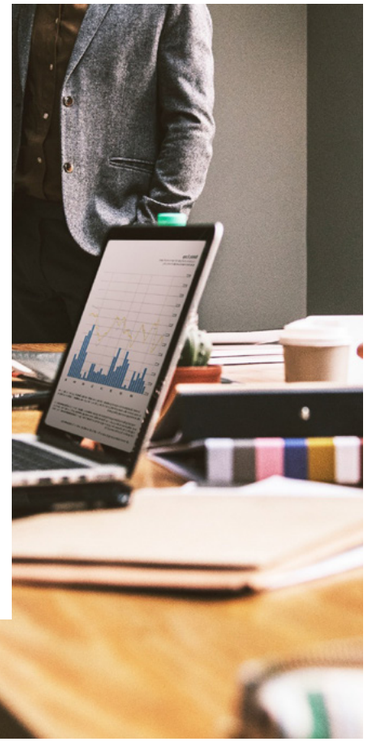
- Focus on identifying the potential product needs of customers accurately, and try to strike the balance between the business indicators of the Company and its product performance.
- Introduce new technologies, new products and new equipment to facilitate standard changes according to customer quality feedback, peer benchmarking results, and the latest changes in policies, laws and regulations.

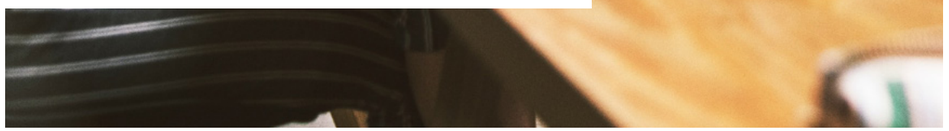
Product standard management Product development control procedures

- Share information through the customer information platform and the external information sharing platform in the process of product standard design and maintenance.
- Allow factories to participate in the standardized evaluation of plans, and identify, improve and optimize Loopholes.

Product shipment standard Product internal control standard

- The Customer Quality Center is responsible for approval and filing management of standards, and each BU is responsible for publicizing and implementing standards, and working out standards for product shipment and internal control.





Practicing Low-carbon Smart Operation

As a new energy enterprise with the vision of "keeping environmentally friendly", the Company is obliged to support the achievement of two goals, emissions peak and carbon neutrality. For one thing, the Company strives to lessen energy consumption for production, cut emissions generated in production, better resource recycling and utilization, and take other measures to reduce carbon emissions in the given production and operation process. For another, the Company continues to promote intelligent manufacturing, upgrade and introduce new technologies, and facilitate the application of Industry 4.0 production modes in order to enhance flexible and lean manufacturing capacity, and contribute to environmental protection and low carbon depending on intelligent technologies.

◎ Social Recognition and Honors in Low-carbon Smart Operation

Awards	Awardees	Awarders
Green Factory of the Year 2021 (National)	Tianjin Zhonghuan Advanced	Tianjin Institute of Industry and Information Technology
Green Factory of the Year 2021 (National)	Huanxin	Tianjin Institute of Industry and Information Technology
Wuxi Green Factory	Zhonghuan Applied Materials	Wuxi Bureau of Industry and Information Technology
107 Efficient Imbricated Solar Cell Module Intelligent Workshop	Huansheng	Wuxi Bureau of Industry and Information Technology
Wuxi Intelligent Factory	Zhonghuan Advanced	Wuxi Bureau of Industry and Information Technology
2021 Wuxi Intelligent Workshop	Zhonghuan Applied Materials	Wuxi Bureau of Industry and Information Technology

Green Factories

Adhering to the concept of “Environmental friendliness, Employee support, Social respect and Customer trust ”, the Company keeps its leading position in innovation worldwide of automation technology application, recycling technology application, low-emission or no-emission technology in the production process in order to cut costs, improve product quality, and implement manufacturing with less labor. To achieve safety and environmental protection goals, the Company implements applicable laws, regulations, rules and normative documents concerning safety production, operates the ISO14001 environmental management system effectively, practices the "target + process" dual evaluation mechanism for safety and environmental protection, and takes effective measures to reduce energy consumption and wastes.

The Company entrusts a qualified third party to monitor all pollutants discharged annually according to the requirements specified in the pollutant discharge permit. The local environmental protection department also conducts supervisory environmental inspections regularly. In 2021, there was no illegal pollutant discharge in the production bases of the Company.

In 2021, the Company deployed 15 production plants in four production bases in Tianjin, Jiangsu, Inner Mongolia and Ningxia. Ten out of them have passed ISO14001 environmental management system certification, and three are undergoing system certification. Besides, two production plants have been rated as national-level green factories and one production plant has been rated as municipal-level green factories.

Water Resource Management

Valuing sustainable use of water resources, Zhonghuan Semiconductor adopts an external tool - the Aqueduct Water Risk Atlas of the World Resources Institute (WRI) to evaluate water pressure for 15 production plants that have been put into operation nationwide.

As shown by WRI data, a total of 15 production plants that have been put into operation, including 2 located in areas with extremely high water pressure and 3 in areas with high water pressure for the Semiconductor Materials Business Unit, as well as 4 in areas with extremely high water and 6 in areas with high water pressure for the New Energy Photovoltaic Business Unit.

◎ Analysis of Water Pressure in the Areas Where the In-service Projects of Zhonghuan Semiconductor are Located

Water pressure	High	Extremely high
Semiconductor materials	3	2
New energy photovoltaic	6	4

In order to weaken the dependence on local water resources, all production bases have made efforts to reuse water resources through collection and reuse, reuse by equipment, and wastewater regeneration. The Company has 6 production plants that are subject to major pollution discharge control by the local environmental protection department, including 5 plants that have been announced as the pollution discharge bases under key control for water environment. Within the above production bases are equipped with sewage treatment stations. The production waste water is treated by an independent system until the treated water meets discharge requirements and then is discharged to the local sewage treatment stations for further treatment.

◎ Water Conservation Efforts and Achievements of the Semiconductor Photovoltaic Business Unit

Reuse by equipment	Achievement
• Water-saving renovation of the overflow tank of the washing machine for water conservation purpose, which cuts tap water consumption by 500 tons throughout the year	500 tons water saved throughout the year
Waste water regeneration	**Achievement**
• Regenerate production waste water	180,000 tons water saved throughout the year

◎ Water Conservation Efforts and Achievements of the New Energy Materials Business Unit

Collection and reuse	Achievement
• Recycle waste water for toilet flushing	60,000 tons water saved throughout the year
• Recycle condensate water	50,000 tons water saved throughout the year
Reuse by equipment	**Achievement**
• Recycle washing water through Litian sand carbon filters	30,000 tons water saved throughout the year
Waste water regeneration	**Achievement**
• Recycle concentrated water	180,000 tons water saved throughout the year
• Recycle rinse water	260,000 tons water saved throughout the year

Emission Management

Production bases treat exhaust gas generated in the production process in exhaust gas treatment systems before emission. Exhaust gas treatment equipment comes with two categories: organic exhaust gas treatment equipment, and acid-base exhaust gas treatment equipment. Substances discharged from exhaust pipes after treatment meet the *Integrated Emission Standard of Air Pollutants*.

Hazardous wastes generated by production bases of the Company mainly include acid-containing waste liquid, waste packaging materials such as empty barrels, waste fillers such as waste activated carbon, waste rubber and rubber-containing waste such as plastic barrels, waste engine oil, waste mineral oil and other oily wastes. The Company employs qualified service suppliers to treat hazardous wastes said through neutralization, physical and chemical process, recycling, land-filling, incineration and regeneration. General wastes generated in the production process include sludge after water treatment, silicon sludge, waste silicon wafers, waste silicon rods and other waste products, as well as diamond wire, waste crucibles and other consumables. The Company entrusts qualified service suppliers to treat these wastes through composting, land-filling and recycling.

◎ Pollutant Emission Management

Categories		Treatment
Exhaust gas	Acid and alkaline exhaust gas	Discharge exhaust gas that meets the discharge standard after purifying and absorbing treatment in scrubbing towers, and discharge waste water generated to the sewage treatment system
	Alkaline exhaust gas (ammonia mainly)	Purify exhaust gas in scrubbing towers
	Organic exhaust gas	Conduct catalytic combustion for organize exhaust gas after absorbing treatment by activated carbon or concentrating treatment
	Dust exhaust gas (fine silica particles mainly)	Treat exhaust gas by dust control units
Waste water	Ph (hydrogen ion concentration), COD (chemical oxygen demand), ammonia nitrogen and fluorinion	Discharge waste water that meets the discharge standard into the designated urban sewage pipe network after treatment in the sewage treatment system
General wastes	Sludge after water treatment	Employ a qualified service supplier for treatment (composting or land-filling)
	Waste products (such as silicon sludge, waste silicon wafers and waste silicon rods)	Employ a qualified service supplier for treatment (recycling)
	Consumables (such as diamond wire and waste crucibles)	Employ a qualified service supplier for treatment (recycling)
Hazardous wastes	Acid-containing waste liquid	Employ a qualified service supplier for treatment (neutralization and physical and chemical treatment)
	Waste packaging materials (such as empty barrels)	Employ a qualified service supplier for treatment (recycling)
	Waste fillers (such as waste activated carbon)	Employ a qualified service supplier for treatment (land-filling, incineration and regeneration)
	Rubber-containing waste (such as waste rubber and rubber barrels)	Employ a qualified service supplier for treatment (incineration)
	Oily waste (such as waste engine oil and waste mineral oil)	Employ a qualified service supplier for treatment (incineration and recycling)

Intelligent Factories

Apart from labor and cost reduction, intelligent manufacturing also involves a necessary path to the next generation of products and solutions with better quality. Sticking to the concept of "Intensive innovation, integrated innovation, joint innovation, collaborative innovation", the Company continues to facilitate the construction of industrial automation, intelligent logistics, industrial big data platforms, and promote the application of Industry 4.0 production modes in the operation process and operation scenarios of its business sectors. All these efforts are made to enable its intelligent manufacturing mode, enhance its leading quality control ability and technical cooperation ability fully, and help it develop into a benchmark that affects the industry, leading industrial transformation and upgrading with advanced manufacturing and intelligent manufacturing to promote high-quality development of the industry.

In 2021, the Company was granted five honors in the "Guang Neng Bei" Photovoltaic Industry Evaluation initiated by SOLARBE, including "Photovoltaic 'Beacon' Award", "2021 Excellent Product", "The Most Influential Photovoltaic Enterprise", "The Most Influential Photovoltaic Intelligent Manufacturer" and "The Most Influential Photovoltaic Module Enterprise".

◎ 2021 "OPTICAL ENERGY CUP" Honors

Photovoltaic Beacon Award

2021 Excellent Product - Type-P Ultra-thin Silicon Wafer with Mass Production

The Most Influential Photovoltaic Materials Enterprise

The Most Influential Photovoltaic Intelligent Manufacturer

The Most Influential Photovoltaic Module Enterprise

Under the background of Industry 4.0 Production, the Company improves the "Stereotype" and "Deep Blue AI" learning models of the wafer manufacturing process constantly, relying on digitization, automation and intelligence, and enhances its flexible manufacturing ability to achieve manufacturing transformation. The intelligent manufacturing progress, and lean and flexible manufacturing enhancement of the Company contribute to the significant rise of labor productivity, continuous fall of factory operation cost, constant rise of product quality and consistency, and effective improvement of comprehensive utilization of resources.

In 2021, the company launched high-efficiency solar ultra-thin silicon monocrystalline wafer intelligent factory project of Tianjin Huanou New Energy Technology Co., Ltd. for the purpose of building the G12 factory following the concept of designing a intelligent chemical factory in a new generation. At the same time, in order to promote the matching of crystal production capacity, the Company has launched high-efficiency solar ultra-thin silicon monocrystalline wafer intelligent factory project whose annual production capacity reaches 25GW ("DW Phase III") and high-purity solar ultra-thin silicon monocrystalline material intelligent factory project whose annual production capacity reaches 30GW ("DW Phase IV"). ("DW Phase IV"). All of these projects are designed as industrial 4.0 intelligent plants to accelerate large-scale production and large-scale applications of company G12 single crystal silicon products, and will create share value with upstream and downstream industrial chains.

In addition, the Company designs a new production base following the Industry 4.0 system, empowering the industry with the "Deep Blue" intelligent manufacturing model, to build a benchmark factory for intelligent manufacturing. In 2021, the 3GW efficient imbricated solar cell module intelligent factory invested and constructed by Huansheng New Energy an intelligent manufacturing demonstration factory.

◎ Industry 4.0 Construction

"Stereotype" takes engineers as the core. It works to form a process model and an operation model relying on practical experience and incident handling experience, and establish monitoring factor parameter library and a stereotype model database.

Focusing on Industry 3.0 and overall product quality management, the Company improves granularity in product management, and establishes a quality management system to enable traceability and control in the product life cycle.

Combined with the "Deep Blue" learning model, the Company enables the "adaptation" of the "stereotype" optimal solution and strengthens the flexible manufacturing abilities to realize flexible production lines, flexible supply chains and flexible marketing.

The Company strives for lean flexibility. It continues to propel flexible manufacturing and integrate flexible production lines, flexible supply chains and flexible marketing under the guidance of lean management concept.

Zhonghuan Advanced Semiconductor Materials Co., Ltd.: An Industrial Internet Benchmark Factory

Relying on the integrated management and control platform, Zhonghuan Semiconductor Silicon Wafer Factory practices intelligent factory, information-based management and lean manufacturing to establish an information-based, digital and intelligent semiconductor wafer internet industrial benchmark factory.

- Improved management efficiency based on information: Set up MES, PLM, ERP and other systems building on platforms and work with intelligent equipment to enable optimization in production site, production management, and operation management.
- Whole process optimization for a new business mode: Optimize products, assets and business throughout the process, empower intelligence into industrial equipment, production process, and better safety and environmental protection management to achieve an innovative model of business based on intelligent production.

Intelligent production measures	Achievement
• Flexible manufacturing in sticking, wire cutting, degumming and cleaning, inspection and other links	• Production of thin slices, and silicon cost reduction by 11.8%; • Rise in labor productivity by 300%

Huansheng New Energy: An Intelligent Manufacturing Demonstration Factory

Huansheng New Energy has built a new efficient imbricated solar cell module smart factory featuring digital, information-based, integrated and intelligent. The factory involves simulation design, an intelligent equipment platform, digital intelligent production workshops, artificial intelligence technology application, Internet of Things construction among workshops, an intelligent information management and control platform, data collection and analysis, an advanced control system, and 5G network in workshops in order to realize intelligent manufacturing.

Intelligent Manufacturing Factory

Creating Social Values

Pooling Team Strength

With employment and promotion based on abilities, a well-established pay system, employee benefits, long-term talent development strategies, and characteristic cultural activities, the Company strives to help employees adapt to changes and embrace multiple challenges actively in the future, and sticks to the “people-oriented” concept to promote the steady and quality development of Zhonghuan Semiconductor for a long term. Thanks to its sustainable business strategy and technological innovation strength, the Company was titled “Forbes, 2021 The China’s Most Sustainable Employer”.

Employee Recruitment and Retention

Adhering to the people-oriented concept, the Company has worked out the *Recruitment Management Procedures*, the *Employee Management Regulations* and other regulations in accordance with applicable laws and regulations such as the *Labor Law of the People's Republic of China* and the *Labor Contract Law of the People's Republic of China* to ensure that employees enjoy equal rights in recruitment, employment, compensation, benefits, training and promotion regardless of ethnicity, gender and religious belief.

The Company redoubles its efforts to protect the safety and health of female employees and minors during production. Referring to the *Special Regulations on Labor Protection of Female Employees* and the *Law of the People's Republic of China on the Protection of Minors*, the Company has formulated the *Special Protection and Management Regulations of Female Employees and Minors*. The document prohibits the recruitment of minors under the age of 16 by verifying the valid identity certificates of applicants by various methods in employee recruitment, entry approval, entry registration and other links, and specifies labor taboos and legitimate rights of female employees in special physiological periods such as menstruation, pregnancy and lactation period. Besides, the Company prohibits forced labor and ensures that all employees enjoy rest days in accordance with the policies of the Company and national laws and regulations.

Compensation and Incentive Measures

The Company concludes collective contracts and collective negotiation agreements on wages every year with all employees, and purchases social insurances fully for employees, including endowment insurance, medical insurance, work injury insurance, unemployment insurance and maternity insurance. The collective negotiation agreement on wages concluded in 2021 clarified the increase of total wages and per capita wages by 13% and 17% respectively.

The Company keeps improving its medium and long-term incentive mechanism and its benefit sharing mechanism between employees and the employer to ensure the Company, its shareholders and employees share consistent interests so that all parties focus on the long-term development of the Company and create value for shareholders. Furthermore, the Company upgrades the corporate governance structure, and betters the long-term and effective incentive and restraint mechanism to ensure its stable and sound development for a long term, fully mobilize the enthusiasm and creativity of employees, attract and retain excellent management talents and business talents, and enhance cohesion among its employees and its competitiveness.

The Second Employee Stock Ownership Plan

The *Second Employee Stock Ownership Plan (Draft) and its Summary Proposal* adopted by the Company on February 1, 2021 approved the implementation of the second employee stock ownership plan. Employees participating in this plan did not exceed 464 in total, including 7 directors, supervisors, and senior executives, and 457 other key employees in management, technology, and marketing. Employees participating in the employee stock ownership plan totals 461, holding stocks amounting to RMB91,102,800.

On 29 September 2021, the Company considered and passed the "Proposal on the Allocation of Reserved Shares of the Second Employee Stock Ownership Plan", which proposed to allocate RMB3,987,000 of incentive fund and 7,974,000 shares of the Second Employee Stock Ownership Plan to 47 incentive recipients.

2021 employee stock ownership plan

In June 2021, the Company formulated and passed *2021 Employee Stock Ownership Plan (Draft)*. In the plan, the special incentive fund did not exceed RMB 324,120,000. The number of underlying stocks that could be purchased and held was capped to approximately 10.6689 million, accounting for 0.35% of the total share capital of the Company currently. Employees participating in this plan did not exceed 815, including 11 directors, supervisors and senior executives, and 804 other employees at most.

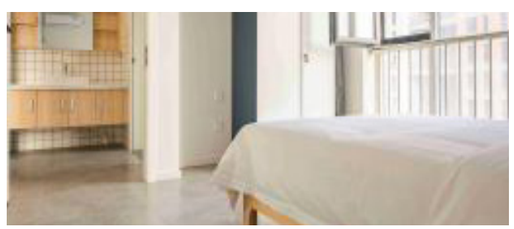
2021 Stock Incentive Plan

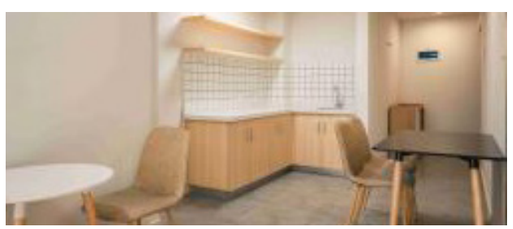
In June 2021, the Company formulated and passed *2021 Stock Option Incentive Plan (Draft)*. In this plan, 34 employees including directors, senior executives and core business (technical) employees who worked in the Company and its subsidiaries when the plan was announced were granted 4,856,800 stock options as an incentive, accounting for 0.16% of the total share capital of the Company at that time by the exercise price of the stock options granted RMB30.39 per share.

Benefits and Activities

In addition to statutory benefits such as "five social insurances and one housing fund" and "paid leaves" in accordance with national regulations, the Company has also developed a complete employee welfare system, including annual physical examination, holiday benefits, employee birthdays, greetings to employees in case of marriage, childbirth, disease and retirement, and condolences to employees in case of their deaths or the deaths of their direct relatives. Also, the Company cooperates with well-known domestic shopping platforms in in-house purchase activities among employees, allowing employees to enjoy exclusive preferential policies, in order to improve their sense of happiness.

What's more, the Company reconstructed dormitories in 2021, and completed the renovation of dormitories in Yixing and Tianjin plants as planned. To be specific, Yixing Plant has provided 642 white-collar apartments for 562 employees and 668 blue-collar apartments for 1,900 employees. Tianjin Plant has upgraded 521 rooms in the dormitory, accommodating 1,424 employees.





White-collar Apartment in Yixing Plant

The Company attaches great importance to the work-life balance of employees. In 2021, its labor unions at all levels organized 80 employee activities in various forms, including vocational skills competitions, sports events, activities for festivals, fellowship activities, family day activities and interest club activities, which enhanced the cohesion among employees, increased communication among employees and spread Zhonghuan culture.

Spreading Zhonghuan Culture

Building on the corporate culture accumulation of 63 years, the Company has established a corporate culture system covering the "people-oriented" core concept, the original aspiration of "long-lasting growth of Zhonghuan Semiconductor", the vision of " Environmental friendliness, Employee support, Social respect and Customer trust ", and the core value of "engineer-respected culture, entrepreneurship mindset, three Don'ts, and change being better". Based on the corporate culture system, the Company has defined business management concepts, talent management principles, organizational management principles and business management principles. The culture system, together with concepts and principles, works to regulate and guide the positive and negative conducts of employees.

In addition, the Company makes efforts to operate its WeChat official account "Happy Zhonghuan", promote the outstanding deeds of model figures by launching an interview column "Zhonghuan Figures", better the corporate culture IP system by upgrading Zhonghuan IP Image 2.0 Version and creating IP character derivative emojis, organize corporate cultural activities, such as "Three Cups of Coffee", peripheral products of corporate culture and Family Day activities, to provide younger and benchmark-based communication channels, and implement clear and effective practices. Guided by the corporate culture, Zhonghuan Semiconductor strives to simulate organizational vitality, enhance the happiness of employees, and inject new momentum into its high-quality development.

Employee Group Activities, IP Zhonghuan Emoji Image

Advocating the Spirit of Craftsmanship

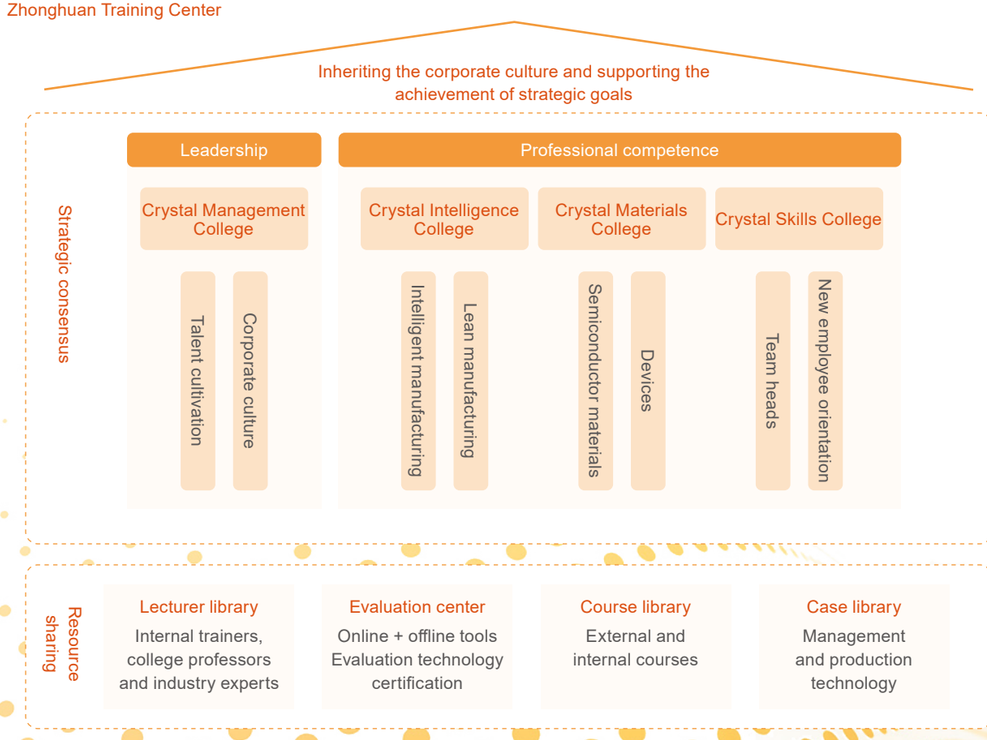
In August 2021, the labor union of the Company organized a vocational skills competition themed as "dream with ingenuity, innovation with competition, and technological progress for a better future". Focusing on operation and production, this competition included nine events, such as wire cutting for wire net, grooved sheave replacing, furnace disassembly and cleaning, remote crystal pulling, wire disconnection by all-in-one machines. Nearly 600 participants from Tianjin, Inner Mongolia and Yixing competed fiercely on the field, with 72 front-line employees with excellent skills winning prizes. The competition reflects the craftsmanship spirit of technical talents to keep improving and pursue excellence and stimulates the vitality of the employees in creativity and innovation fully. They are all contributors to the quality development of the Company.

Vocational Skills Competition

Talent Cultivation

In order to establish a sound training system, inherit the corporate culture, and support the achievement of strategic goals, the Company has set up Zhonghuan Training Center, including four sectors with eight major training courses. Four sectors include Crystal Management College, Crystal Intelligence College, Crystal Materials College and Crystal Skills College. Building on common strategic goals, the Management Training focuses on leadership cultivation by developing talents and overall corporate culture. The Intelligence Training, Materials Training and Skills Training pay attention to professional competence cultivation. Moreover, Zhonghuan Training Center is provided with a number of resource sharing libraries, including lecturer library, evaluation center, course library and case library, to help the Company gather experience. The online learning platform of Zhonghuan Training Center is an important move to foster a learning organization, and shares resources with the industries/companies.

◎ Online Learning Platform Architecture of Zhonghuan Training Center



Increase More Talent Training Channels

In order to facilitate the growth and development of employees, to help employees to improve themselves , the Company has provided various talent training channels, including university-enterprise cooperation to attract talents, management training programs to cultivate new talents, and new manager training programs for talent growth.

University-enterprise cooperation

- The Company has signed university-enterprise cooperation agreements with 5 universities, namely Tianjin University, University of Chinese Academy of Sciences, Jiangsu University of Science and Technology, Inner Mongolia University and Nankai University, aiming to establish scholarships, set up training practice bases, customize training, implement intern programs or part-time exercise programs, build student career development think tank resources, and provide employment recommendations.
- In the future, the Company plans to launch university-enterprise cooperation with 35 undergraduate colleges and 28 vocational colleges to expand talent recruitment and training channels.

Management training program

- One-year growth plan: The one-year training plan works to enable graduates to deeply understand the corporate culture of the Company, integrate into the organization, grasp the role cognition as newbies, master communication and coordination skills and improve self-management skills so that they are able to work independently after one year. The training emphasizes on the responsibility of graduation students for their own personal development, and values the role of self-motivation and growth aspirations in their development. According to Rule 721 of adult learning, the plan covers various training modes for graduates, including learning in work practices and learning from role models (tutors), and learning in courses.
- 1+X training mode:

  Intensive management and control in course learning: Strengthen supervision of learning process, arrange learning tasks monthly, work out learning goals and plans, and conduct scoring management.

  Talent evaluation: Conduct evaluation every 6 months and 12 months, grant outstanding graduates bonus as an incentive according to evaluation results, and select top 30% trainees in the year-end elevation to join the Elite Training Camp directly.

  Interpersonal connection of graduates: introduction before employment, induction training, mid/final training, and "tree hole" feedback mechanism of graduates;

  Graduate training review mechanism: Organize the company-level graduate training review quarterly.

Allow subsidiaries to arrange tutorial teaching, regular training interviews, symposiums and other training courses and other diversified growth training accompaniment independently to facilitate the growth of trainees.

New manager training program

- It is a new manager training program dedicated to internal promotion and external introduction. The program helps new managers inherit corporate culture, improve management abilities, promote the implementation of corporate strategies, and transfer from key business employees to managers in order to cultivate managers who are able to master strategies, pass on culture and lead teams.
- The new manager training system is characterized by normal, rolling and systematic training, and enables experiential learning and action learning to cultivate all-round talents from multiple dimensions.

Safety Production

The Company adheres to the safety management policy of "observing laws and regulations, putting people first, practicing safety production and reducing occupational risks", and complies with the *Work Safety Law of the People's Republic of China*, the *Law of the People's Republic of China on the Prevention and Control of Occupational Diseases* and other applicable national occupational health and safety production laws, regulations and standards. And it has established an occupational health and safety management system according to GB/T45001-2021, and obtained ISO45001 Occupational Health and Safety Management System certificates for its eight production bases.

In line with occupational health and safety production laws, regulations and standards, the Company has formulated the *Safety Management Manual* and 27 management regulations to define safety production goals, and keeps monitoring and measuring systems by process methods to ensure its effective operation and continuous improvement. In 2021, the Company achieved all safety production goals successfully. And its 11 production subsidiaries carried out 709 safety training activities and 271 safety drills totally.

100%

Rate of employees' participation in safety training

100%

Rate of identification and rectification of potential security hazard

100%

Rate of employees' participation in the emergency plans of production safety accidents

In 2021, the new *Work Safety Law of the People's Republic of China* came into force. This new version specifies information-based construction, establishment of a dual prevention mechanism involving management and control of safety risks by levels and identification and response of potential hazards, and improvement of the risk prevention and removal mechanism. The Company further improves its internal safety management system according to the above requirements.

The Company has launched a safety production information management platform, providing interfaces for the Group, regions, sectors, and the Company. It includes 38 sub-modules out of 10 management modules with 80 specific work tasks. This platform has achieved six major functions: the visualization of basic management information for safety production standardization; real-time pushing of plans/tasks and real-time tracing in the whole process; professional risk identification and control for establishment of a risk database; potential hazard identification/dynamic management and control of special operations; real-time collection of dynamic safety information by the system for establishment of a database; regular identification of safety production laws, regulations and standards by the expert team for establishment of a safety think tank. The key and difficult problems in real-time safety supervision, trend analysis of potential hazard data and other aspects in factories were thus solved.

The Company invites safety experts to promote the dual prevention mechanism of managing and controlling safety risks by levels and identifying and tackling potential hazards, and organizes on-site training and exchanges related to the dual prevention mechanism in the production bases of Hohhot, Yixing and Tianjin. Also, it identifies the management and control performance of safety risks by levels in all areas, working procedures and positions to ensure that safety risk management and control is implemented fully. Moreover, it organizes meetings on problem rectification and improvement to clarify identification methods of risks and formulating principles of management and control measures to practice identification, management and control of risks in place.

Co-building a Better Society

Social and environmental changes affect the development of the Company. In the context of a community with a shared future for mankind, the Company upholds a responsible development attitude, and pays attention to social development. In internal operation, the Company builds a responsible production value chain, and strengthens cooperation and management of its partners to jointly promote sustainable development. In external communication and response, the Company remains a high sense of social responsibility, contributes to society whiling developing its main business, and strives for a better society with communities.

Fostering a Responsible Value Chain

In order to ensure sustainable and sound business cooperation with partners for virtuous circle, and build cooperative relationship on the basis of trust, honesty, frankness and integrity, the Company has formulated the *Supplier Management Regulations*, the *Supplier Audit Management Regulations*, and the *Code of Conduct for Partners of Zhonghuan Semiconductor*, resulting in normalized management and process of supplier introduction, audit, quality management and improvement. Besides, the Company has established compliance standards and moral requirements for its business. With a clear division of duties, the Strategic Management Department, Procurement Department and production subsidiaries of the Company jointly participate in supplier management and audit.

In supplier audit, the Company pays attention to the performance of suppliers in quality, on-time delivery rate, cost advantage, environmental protection and labor safety. For new suppliers, the Company reviews their certification of ISO14000, OHSAS18000 and other environmental and occupational safety systems, and their management of hazardous substances. For existing suppliers, the Company organizes annual supplier audits and quality audits. If suppliers are found not to meet the requirements of the environmental system or the management requirements of the Company in labor and goodwill during auditing or cooperation, the Company will urge them to rectify. If they still fail to meet the management requirements of the Company within the rectification time, the Company will start the supplier knockout procedure.

© Classification and Quality of Raw and Auxiliary Materials Provided by Suppliers in 2021

Class of raw and auxiliary materials	Scope	Quantity
Class A	Materials, components and parts that have significant impact on product quality	85
Class B	Auxiliary materials and inner packaging materials other than Class A and Class C	20
Class C	Outer packaging materials and auxiliary materials that have low impact on product quality	4

© Supplier Audit Principles

Consider the following aspects when selecting suppliers to be audited:

(1) Suppliers providing key materials, especially Class A materials;

(2) Suppliers with a high supply share of materials in each class, and those with insufficient supply capacity;

(3) Suppliers with frequent quality problems, and those with quality feedback that cannot be closed for a long time;

(4) Suppliers with a score less than 65 points in the annual supply evaluation.

In principle, suppliers providing Class A materials should be audited on site at least once every three years.

Where suppliers do not meet the requirements of the environmental system or the management requirements of the Company in labor and goodwill, the Company will urge them to rectify. If they still fail to meet the management requirements of the Company within the rectification time, the Company will start the supplier knockout procedure.

In 2021, the Company organized on-site audits for 30 qualified suppliers in such aspects as compliance with laws and regulations related to environment, labor and ethics, quality management systems, and management of toxic and hazardous substances. There were no serious violations of laws and regulations.

Management of Conflict Minerals

Raw materials provided by the Company's suppliers, a semiconductor and new energy photovoltaic manufacturer, may involve mineral materials from conflict minerals. Hence, the Company requires its suppliers to fill in the *Supplier Basic Information Form*. If mineral materials from conflict minerals are involved, it is needed to investigate whether the source of mineral materials fails to meet RMI requirements referring to the updated content at the Responsible Minerals Initiative (RMI) website. If tin materials are needed in production, the Company requires its suppliers to provide certificates of origin if they supply tin materials to the Company to ensure that the tin materials used by the Company are not conflict minerals. Upon investigation, the tin materials purchased by the Company are all mined and processed in China, and there are no suppliers failing to meet the requirements.

Contributing to Social Prosperity

In 2021, the first year of embracing a moderately prosperous society in all respects, the Company actively responded to expanding poverty alleviation fruits, promoting rural revitalization and consolidating poverty relief achievements by targeted assistance. As one of ten major targeted poverty alleviation projects determined by the State Council, poverty alleviation through photovoltaic programs plays a positive role in social development and industrial drive. With a innovative mechanism and standardized operation, the Company practices photovoltaic programs for poverty alleviation, driving the development of labor and material resources in underdeveloped areas. Its efforts integrate new energy utilization, energy conservation and emission reduction into poverty alleviation, fully pushing the rural revitalization strategy.

The Company actively implements national policies, such as the *Opinions of China Securities Regulatory Commission on Giving Full Play to the Role of the Capital Market in Serving the National Poverty Alleviation Strategy*, the *Opinions of the National Development and Reform Commission on Poverty Alleviation by Photovoltaic Power Generation*, and the *Guiding Opinions on the Implementation of the 13th Five-Year Plan for Renewable Energy Development*. As a response, it launches poverty alleviation by photovoltaic power generation in Inner Mongolia, Hebei, Yunnan, Sichuan and other regions. Considering the industrial characteristics and resource advantages of different regions, Zhonghuan Semiconductor selects poverty-stricken regions meeting photovoltaic construction conditions, and actively carries out photovoltaic power generation projects for poverty alleviation, driving local development

scientifically and effectively. For one thing, the Company leverages land and light resources for electric power generation to improve the regional environment and power supply structure. For another, it helps poverty-stricken population with revenue from power generation to contribute to the fight against poverty. Moreover, following the principle of "employing local talents", the Company recruits local graduates and professionals in electric power, numerical control and other relevant majors to engage in operation and maintenance of power plants, and employs local labor force from poor families to weed and clean photovoltaic panels in power plants, solving some employment problems according to local conditions.

By the end of the reporting period, the Company has constructed 6 photovoltaic power plants for poverty alleviation, which are all ground-based centralized power plants, with project investment amounting to 1,055.8124 million yuan. The photovoltaic power generation projects implemented by the Company stably increase the income of the impoverished people to get out of poverty, effectively protect the ecological environment, and create a "multi-benefit" effect in terms of actively promoting supply-side structural reform in the energy sector.

Fighting Against the Epidemic with Full Efforts

After the outbreak of the epidemic, the Company has taken combined measures for epidemic prevention and control to collect information concerning epidemic situation, predict and control epidemic situation properly, and minimized risks timely. At the beginning of the epidemic, the responsible department has formulated the management plan of leading cadres, the emergency plan for the supply chain, and the management plan for the personnel in the epidemic area and those passing through the epidemic area during COVID-19 prevention and control period. According to deployment, the Company has made great efforts to strengthen epidemic prevention and control among employees, and do a good job in workplace disinfection to ensure the personal safety of employees and the normal progress of production and operation. Besides, the Company strives for epidemic prevention and safety, production and construction, and normal life of employees, sticking to the people-oriented concept, so as to truly implement the corporate vision of " Environmental friendliness, Employee support, Social respect and Customer trust ".

Responding to the call of the state, the Company rises to the challenge by shouldering important responsibilities for epidemic prevention and control and industrial development. It redoubles efforts to fight against the epidemic, stabilize investment, and drive development by making steady progress in the global layout of its business sectors, which shows its firm determination to scientific epidemic prevention and the management accumulation of lean production and manufacturing capabilities, and the fulfillment of corporate responsibility.

Consolidating Business Management

Corporate Governance

An effective governance system helps ensure the sound and continuous operation of the Company, and plays an incentive role with more effect, allowing the internal and external members of the Company to enhance thorough understanding of the Company with a view to coordinated development. Valuing the rights and interests of investors, the Company discloses information through multiple channels and communication modes. Furthermore, the Company works out scientific procedures for remuneration and performance appraisal of the senior management, safeguards their rights and interests that are consistent with those of the Company, and strengthens their enthusiasm to contribute to the Company constantly with their abilities.

Protection of Investor Rights and Interests

The Company actively discloses and communicates information to shareholders and creditors to ensure that all investors are informed of major developments affecting the business conditions of the Company timely and have access to information about the Company. To this end, the Company releases information to investors through conferences, publications and online platforms, including annual general meetings of shareholders, extraordinary general meetings, annual and interim reports issued regularly as well as announcements, briefings and press releases.

The Board of Directors of the Company attaches great importance to the management and maintenance of relations with investors. It has established a good IRM operation system extending the responsibility of investor relations management to the Company's controlling shareholders, management and sponsor institutions, and deepening the scope of investor relations management to various types of investors such as institutional investors, strategic investors, small and medium investors, including controlling shareholders, management and sponsor institutions. It maintains continuous communication with the capital market through various forms such as investor hotlines, the interaction platform of Shenzhen Stock Exchange, online performance briefings, receptions of investors for survey.

In 2021, the Company convened 4 general meetings of shareholders or extraordinary general meetings. For major projects, the Company held investor briefings and media briefings to safeguard investor rights and interests. For major matters, the Company communicated with investors effectively through on-site exchanges, and Q&A meetings for media and related institutions. Besides, it organized investors to visit the Company for survey, and attend strategy meetings, roadshows, and reverse roadshows of securities companies. It answered more than 3,300 calls from investors, answered nearly 400 questions raised by investors on the interaction platform, held 7 briefings on corporate performance and special matters, and received more than 2,000 investors.

Performance Appraisal of Executives

The Company practices strict decision-making procedures for the remuneration of its senior executives. The Remuneration and Appraisal Committee is responsible for formulating the remuneration plan for senior executives, and the remuneration and performance appraisal of senior executives should receive deliberation and approval by the Board of Directors before implementation. The remuneration and performance appraisal of directors and supervisors should be reviewed and approved by the Board of Directors and the General Meeting of Shareholders. In addition, the Board of Supervisors and independent directors, as a supervisory body, should express their opinions on whether the remuneration plan is conducive to the sustainable development of the Company, and whether there is any situation that obviously impairs the interests of the Company and all its shareholders.

Determination Basis

• Basis for Performance-related Remuneration

The Company determines remuneration according to position value and personal ability oriented to charge and value creation mainly, and performance appraisal results as a supplement. With practicing the corporate culture, the Company strengthens the responsibility and result orientation in performance appraisal, advocates that "all resources are easily accessed by contributors ", and adopts a salary structure of "salary + bonus + long-term incentives".

• Basis for stock option incentives

In addition to performance-based remuneration and benefits, a stock option incentive plan has been deliberated and approved by the General Meeting of Shareholders to improve the effective incentive and restraint mechanism for a long term and better the remuneration evaluation system of the Company. The Company has introduced the stock option incentive plan dedicated to directors, senior management, middle management and core technical (business) employees. The plan functions to grant the groups said stock options, and relate the performance results to the exercise of rights in order to motivate the work enthusiasm and creativity of employees.

Evaluation Management

An effective performance appraisal mechanism is an important guarantee for improving the remuneration system. The Company has introduced a systematic and scientific performance management system to provide an evaluation basis for the remuneration of senior executives. The Company integrates KPI and CPI effectively in performance appraisal. Guided by corporate culture, CPI works to strengthen the work style and core competence of cadres and the professional spirit of employees. KPI is mainly related to organizational performance and personal key tasks to realize the common development of the organization and employees.

• Remuneration and performance appraisal management

The Company organizes the year-end evaluation for senior executives according to its operating conditions and individual performance, and determines their annual income according to evaluation results.

• Stock option incentive evaluation management

The evaluation for the stock option incentive plan mainly involves corporate performance and individual performance. The corporate performance is the basic condition to exercise stock options and the precondition of individual performance appraisal. The Company formulates and revises the performance appraisal indicators of all positions every year, and determines the weight and target value of each performance appraisal indicator according to the importance of each indicator. Then, the Company makes statistics on the completion of performance appraisal indicators, and finally figures out the performance appraisal results of individuals.

Risk Management and Control

As risk weaknesses restrict the overall progress of the Company to a certain extent, the Company focuses efforts on risk management while developing constantly, and observes applicable compliance regulations. Furthermore, the Company has worked out a series of regulations and rules to regulate corporate operation, reduce risks in operation procedures and moral constraints, and promote its steady development.

Compliance Management

To practice corporate compliance governance by law, the Company fulfills a series of compliance tasks, compliance training and popularity in such aspects as market and trading partner compliance, protection of corporate intellectual property and core competitiveness, financial and tax compliance, information security, safety and environmental protection, labor employment, listing compliance and quality control. Besides, according to the corporate strategy and the characteristics of the rapid development stage, the Company has gradually established an audit supervision, prevention and control system covering prevention before incidents, management and control during incidents, and supervision after incidents. In line with applicable laws and regulations, the Company conducts audits in related transactions, guarantee business, fund raising, foreign investment and major engineering projects to ensure the legality and compliance of corporate business and the truthfulness and integrity of information disclosed.

Market transaction and business partner compliance	• To meet the needs of foreign customers on supply chain traceability, the Company employs a law firm to launch the supply chain traceability investigation and establish the traceability mechanism. • With the ever-increasing national supervision and punishment for monopolistic actions, the Company gives risk warnings for anti-monopoly declaration in the legal support of projects, and cooperates with business units to make anti-monopoly declarations.
Safety and environmental protection compliance	• In accordance with the *Law of the People's Republic of China on the Prevention and Control of Solid Waste Pollution*, the Company sorts out solid waste treatment procedures and documents to improve its solid waste treatment mechanism.
Information security compliance	• The Company works out the information security strategy based on the trade secret protection system, and develops the data security management requirements for its digital transformation department pursuant to the *Data Security Law of the People's Republic of China*.
Labor safety	• The Company revises its corporate management regulations in terms of competition restrictions, anti-corruption, anti-malfeasance, faithful performance of duties and personal information protection, and also incorporates these aspects into the *Employee Handbook*. • The Company works out the competition restriction management requirements and work plans for its human resource department.
Compliance training and publicity	• The Company organizes the employees of all departments to receive compliance training on export control and economic sanctions, and helps the human resource department carry out training on labor protection and competition restrictions. • The Company teams up with its subsidiaries to conduct compliance publicity focusing on trade secret protection and learning of the *Constitution*.

Anti-corruption

The Company makes efforts to improve Party conduct and combat corruption, following the guideline of "addressing both symptoms and root causes, valuing both punishment and prevention, and giving priority to prevention". To this end, the Company has formulated a series of supervision and management regulations related to compliance with disciplines and laws, including anti-corruption, such as the *Working Rules on Honesty and Self-discipline of Leading Group Members*, the *Measures for Deepening and Standardizing the Implementation of Combating Corruption and Upholding Integrity in the Company*, the *Management Regulations of Zhonghuan Semiconductor on Combating Commercial Bribes*, the *Code of Conduct for Zhonghuan Semiconductor Partners* and the *Management Measures for Punishing Employees Receiving Gifts*, and has released them on its intranet for popularity.

In order to strengthen internal control, prevent operation risks and moral risks, and encourage, integrity of employees in key positions, the Company has formulated the management measures for employees in key positions to strengthen management and rotation of key positions, supervise leaders, cadres, and employees in key positions to fulfill their duties, and hold any violators accountable. There are 2,027 employees in key positions who have signed the *Employee Integrity and Self-discipline Commitment*. In addition, the Company triggers an integrity index survey, with 3,240 participants. In the survey, the participants are asked to score the overall performance of Zhonghuan Semiconductor, their own business sector, and functional departments/business modules. As a result, the integrity index score exceeds 9 points (out of 10).

In order to build a fine Party culture and a corruption-free Party among suppliers, prevent and control integrity risks, and enhance the awareness of integrity and self-discipline between the Company and its suppliers, the Company has worked out the *Code of Conduct for Zhonghuan Semiconductor Partners* pursuant to the *Contract Law of People's Republic of China*, the *Anti-Unfair Competition Law of the People's Republic of China*, the *Criminal Law of the People's Republic of China* and other applicable laws and regulations based on the CPC Central Committee's eight-point decision on improving Party and government conduct and requirements in work with honesty and integrity. A total of 632 partners have signed the *Code of Conduct*.

In order to regulate complaint and report management, the Company provide clear reporting channels such as e-mails, hotlines and mailboxes, and encourages employees and external parties to report corruption cases of both enterprises and individuals in business operation to the internal audit department or the audit committee, such as bribery, extortion, fraud, money laundering and other illegal conducts.

Reporting Hotline and Email of Zhonghuan Semiconductor

Reporting Hotline: 23789766-3228

Discipline Inspection Email: jiwei@tjsemi.com

For protection of informers, the Company is responsible for justice and equity of the reporting process and results, and protects the personal privacy and reporting materials of informers.

◎ Anti-corruption Supervision and Reporting Procedures

ESG Key Quantitative Performance

Topics	Items for quantitative disclosure	Unit	2021	2020
Economy	Total assets at the end of the period	100 million yuan	779.79	587.2
	Operating revenue	100 million yuan	411.05	190.57
	Net profit	100 million yuan	40.30	10.89
	Earnings per share	Yuan	1.3162	0.3770
	Cash dividends	10,000 yuan	35,549.07	18,197.56
	Cash dividend plan	10,000 yuan	1.1 yuan for every 10 shares	0.6 yuan for every 10 shares
	R&D investment	10,000 yuan	257,653.92	90,921.98
R&D	Proportion of R&D expenditure in operating revenue	%	6.27	4.77
	Proportion of R&D employees in total employees	%	8	8.64
	Number of patents	piece	975	732
	Number of patents for invention	piece	154	127
	Number of utility model patents	piece	797	582
	Number of patent under application	piece	613	518
Product quality	First pass yield of products	%	96	93
	Quality feedback frequency	time	940	1,042
	General quality feedback frequency	time	414	705
	Major quality feedback frequency	time	5	0
	Batch feedback frequency	time	1,173	807
Resource consumptio	Electric power consumption	MWh	4,414,449.08	3,067,424.01
	Natural gas consumption	m^3	2,880,687.82	806,550.70
	Steam consumption	m^3	99,613.55	27,594,561.30
	Water consumption	m^3	29,410,088	14,195,157.56
	Including: consumption of water from the municipal water supply network	m^3	10,677,112	7,299,259.31
	Recycle/reused water consumption	m^3	562,662,547	16,774,292
	Total volume of packaging materials used for the shipment of finished products	Ton	119,78	7,670.47
	Recycling volume of packaging materials used for the shipment of finished products	Ton	289.3	185.4

Topics	Items for quantitative disclosure	Unit	2021	2020
Emissions	Exhaust gas emissions	10,000 m^3	403,632.85	499,187.54
	Nitrogen oxide (NO^x) emissions	kg	95,866.29	16,464.16
	Sulfur dioxide (SO^2) emissions	kg	0	408.35
	Greenhouse gas emissions (Scope 1 & scope 2)	Ton of carbon dioxide equivalent	3,774,515	0
	Of which, Greenhouse gas emissions (Scope 1)	Ton of carbon dioxide equivalent	20,597	/
	Greenhouse gas emissions (Scope 2)	Ton of carbon dioxide	3,753,918	/
	Waste water discharge	10,000 m^3	1,122.62	941.901
	Non-hazardous waste discharge	Ton	75,208.50	67,020.49
	Total hazardous waste discharge	Ton	1,050.21	2,968.88
Employee recruitment	Number of employees	No. of ppl	13,371	10,258
	Proportion of male employees	%	81.27	79.26
	Proportion of female employees	%	18.73	20.74
	Proportion of female executives	%	30	30
	Proportion of employees under the age of 30	%	6,386	4,904
	Proportion of employees aged 30 to 50	%	6,851	5,236
	Proportion of employees over the age of 50	%	134	118
	Proportion of employees with the Han nationality	%	12,359	9,572
	Proportion of employees with ethnic minorities	%	1,012	686
	Average wage growth rate	%	8	7.73
	Number of employees in need receiving assistance	No. of ppl	29	33
Employee	Proportion of trained employees in total employees	%	64.95	24.3
	By gender, Male employees	%	82.63	76.3
	Female employees	%	17.37	23.7
	By function, Management	%	4.48	41.6
	Professional	%	44.79	2.5
	Technology	%	40.63	24.2
	Marketing	%	2.20	1
	Operation	%	7.90	30.7
Employee training	Average training hours of all employees	Hour/person	28.78	26.8
	By gender, Male employees	Hour/person	28.06	26.2
	Female employees	Hour/person	32.16	28.9
	By function, Management	Hour/person	20.09	33.4
	Professional	Hour/person	1.54	22.3
	Technology	Hour/person	1.36	24.2
	Marketing	Hour/person	0.51	28.2
	Operation	Hour/person	314.60	20.3
	Number of courses at the online learning platform	No.	1,093	910
	Number of trainees	No. of ppl	136,476	84,968
Health and safety	Coverage of physical exam	%	100%	100%
	Number of employees who died caused by work injuries	No. of ppl	0	0
	Number of work injuries	case	7	27
	Total working days lost due to work injuries	Day	540	1,977
	Frequency of safety education and training activities	time	709	413
	Frequency of emergency drills	time	271	112
Corporate governance	Number of directors in the Board of Directors	No. of ppl	9	9
	Number of female directors in the Board	No. of ppl	4	4
	Proportion of female directors in the Board of Directors	%	44%	44%
	Number of independent directors in the Board of Directors	No. of ppl	3	3
	Proportion of independent directors in the Board of Directors	%	33%	33%
	Number of general meetings of shareholders	time	4	4
	Number of meetings by the Board of Directors	time	17	22
	Number of meetings by the Board of Supervisors	time	9	12
	Number of meetings by special committees of the Board of Directors	time	16	23
Anti-corruption	Number of completed corruption lawsuits filed against the issuer or its employees	case	0	0
	Number of employees receiving anti-corruption training	No. of ppl	1,300	270

1. Source of statistical data: Tianjin Zhonghuan Semiconductor Co., Ltd. and its subsidiaries. Such data is consistent with that in the consolidated statements of the Annual Report. Among them, the statistics of greenhouse gas emissions are Tianjin Zhonghuan Advanced Materials Technology Co., Ltd., Tianjin Huanou Semiconductor Materials Technology Co., Ltd., Huanxin Technology Development Co., Ltd., Tianjin Huanzhi New Energy Technology Co., Ltd., Zhonghuan Advanced Semiconductor Materials Co., Ltd., Wuxi Zhonghuan Applied Materials Co., Ltd., Huansheng Photovoltaic (Jiangsu) Co., Ltd., Inner Mongolia Zhonghuan Advanced Semiconductor Materials Co., Ltd., Inner Mongolia Zhonghuan GCL Photovoltaic Materials Co., Ltd., Inner Mongolia Zhonghuan Photovoltaic Materials Co., Ltd.
2. In 2021, the consumption of resources (electric power consumption, natural gas consumption, water consumption, and packaging materials used for the shipment of finished products) increased significantly compared with that in 2020 as the Company expanded its production with rising production capacity.
3. The GHG emission statistics for the GHG categories include CO_2, CH_4, N_2O, HFC_s, PFC_s, SF_6, NF_3 and follow the *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.*

Benchmarking Index Tables

The *Guidelines for Social Responsibilities of Listed Companies* issued by Shenzhen Stock Exchange

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The *Main Board Information Disclosure Business Memorandum - No. 1 Document: Matters Related to Disclosure in Periodic Reports* issued by Shenzhen Stock Exchange

Content in *Main Board Information Disclosure Business Memorandum - No. 1 Document: Matters Related to Disclosure in Periodic Reports*	Chapters in the Report
1. Overview	
Briefly state the purpose and concept of fulfilling social responsibilities by the Company.	Social Responsibility Management System
2. Fulfillment of Social Responsibilities	
(1) Protection of the rights and interests of shareholders and creditors	Corporate Governance
(2) Protection of the rights and interests of employees	Pooling Team Strength
(3) Protection of the rights and interests of suppliers, customers and consumers	Co-building a Better Society
(4) Environmental protection and sustainable development	Addressing Climate Change Promoting green transformation through technological innovation Practicing Low-carbon Smart Operation
(5) Public relations and social welfare undertakings	Co-building a Better Society
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GRI *Sustainability Reporting Standards* (GRI Standards)

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	103-2	Promoting green transformation through technological innovation Practicing Low-carbon Smart Operation
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	301-3	Practicing Low-carbon Smart Operation
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	302-2	Practicing Low-carbon Smart Operation
	302-3	Practicing Low-carbon Smart Operation
	302-4	Practicing Low-carbon Smart Operation
	302-5	Practicing Low-carbon Smart Operation
Water resource and waste water	303-1	Practicing Low-carbon Smart Operation
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	303-3	Practicing Low-carbon Smart Operation
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	303-5	Practicing Low-carbon Smart Operation
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	305-3	ESG Key Quantitative Performance
	305-4	ESG Key Quantitative Performance
	305-5	Building Green Factories
	305-6	ESG Key Quantitative Performance
	305-7	ESG Key Quantitative Performance
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Definitions of Proper Nouns and Acronyms

Proper nouns/acronyms	Definitions
tapeout	It refers to the final result of the design process for integrated circuits (IC) or printed circuit boards (PCB) before they are sent for manufacturing.
WIP(Working In Progress	It is also known as workshop production management. It refers to a product in process, an assembly line, or a work-in-progress area of the work center to store raw materials, finished products and semi-finished products. Usually, it means raw materials claimed that have undergone some, not all, manufacturing procedures, or that are not put into warehouses of finished products as they have not received quality inspection.
WAT(Wafer Acceptance Test)	It refers to the test of the special test pattern, and the application of electrical parameters to monitor whether each process keeps normal and stable.
LCOE(Levelized Cost of Energy)	It refers to the levelized cost of energy (power generation), generally measured in megawatt hours (MWH). It is often used to compare and evaluate the comprehensive economic benefits of electric power generation relying on renewable energy (photovoltaic energy, wind energy, bio-energy and geothermal energy) compared with traditional electric power generation modes (coal, natural gas and large hydro-power stations).
BOS (Balance of System) cost	BOS cost refers to the cost of the system other than photovoltaic modules. It mainly covers the cost of main equipment such as inverters, brackets and cables, the cost of civil engineering, installation engineering, project design, engineering acceptance, and related cost at the early stage.
Imbricated module technology	Imbricated module technology refers to a technology in which cells are sliced and then welded into strings with dedicated conductive adhesive materials. Cells that are connected by imbrication have no metal grid lines on the surface, and no gap between them. This technology makes full use of the usable surface area of modules and reduces the loss of traditional metal grid lines, thus improving the conversion efficiency of modules greatly.
PCW(Process Cooling Water)	It refers to a process cooling water system that is mainly used for cooling process equipment. The PCW system is equipped with a chilled water system and a cooling water system that work independently. Chilled water is provided by chillers, and exchanges heat with cooling water to cool equipment by reducing the temperature of cooling water.
MES(Manufacturing Execution System)	The manufacturing execution system, as a management system for workshop production, works to transmit information to optimize production activities during the process from the issuance of the work order to the completion of the finished product.
PLM(Product Lifecycle Management)	Product lifecycle management is applied within an enterprise with a single workplace or multiple workplaces, and between enterprises with collaborative relationship in the product R&D filed. It supports a series of application solutions, such as information creation, management, distribution and application throughout the product life cycle. It can integrate human resources, processes, application systems and information related to products.
ERP(Enterprise Resource Planning)	Enterprise resource planning refers to a management platform that provides decision-making and operation means for the decision-makers and employees of an enterprise, following systematic management ideas and relying on information technology.
IRM(Investors Relation Management)	Investors relation management functions to maximize the value of relevant stakeholders, win wide recognition from investors as scheduled, regulate the operation of the capital market, enable the external to engage in constraint on and incentive of corporate operation, maximize the value of shareholders, protect the interests of investors, and ease pressure from regulators by managing information communication content and channels between a company and the financial community or other circles according to the principles of financial communication and marketing.

Report Preparation Instructions

Report Scope

The Report covers Tianjin Zhonghuan Semiconductor Co., Ltd. and its subsidiaries. Unless otherwise specified, this scope keeps consistent with that in the consolidated financial statements of the Annual Report of Zhonghuan Semiconductor (Stock Code: 002129).

Full name of company	Abbreviation of this report
Inner Mongolia Zhonghuan Photovoltaic Materials Co., Ltd.	Zhonghuan Photovoltaic
Inner Mongolia Zhonghuan GCL Photovoltaic Materials Co., Ltd.	Zhonghuan GCL
Inner Mongolia Zhonghuan Advanced Semiconductor Materials Co., Ltd.	Inner Mongolia Zhonghuan Advanced
Wuxi Zhonghuan Applied Materials Co., Ltd.	Zhonghuan Applied Materials
Tianjin Huanou Semiconductor Material Technology Co., Ltd.	Huanou
Tianjin Huanzhi New Energy Technology Co., Ltd.	Huanzhi
Tianjin Zhonghuan Advanced Material Technology Co., Ltd.	Tianjin Zhonghuan Advanced
Tianjin Huanxin Technology Development Co., Ltd.	Huanxin
Zhonghuan Advanced Semiconductor Materials Co., Ltd.	Zhonghuan Advanced
Huansheng Photovoltaic (Jiangsu) Co., Ltd.	Huansheng
Huansheng New Energy (Tianjin) Co., Ltd.	Huansheng New Energy

Time Frame

The Report is an annual report and ranges from January 1, 2021 to December 31, 2021. Some text information may be beyond this scope and has been explained accordingly.

Reporting Basis

The Report is prepared in accordance with the *Guidelines for Social Responsibilities of Listed Companies* and the *Main Board Information Disclosure Business Memorandum - No. 1 Document: Matters Related to Disclosure in Periodic Reports*.

The Report is prepared based on some indicators in GRI *Sustainability Reporting Standards* (GRI Standards 2016) (For details, please refer to the index tables).

Data Interpretation

The data and cases in the Report come from the original records or financial reports acquired from the actual business of the Company.

The financial data in the Report are denominated in RMB. If the financial data here in conflicts with that in the annual financial report of the Company, the annual report shall prevail.

Reliability Assurance

Zhonghuan Semiconductor undertakes that there are no false records, misleading statements or major omissions in the Report, and the Board of Directors of the Company is responsible for the authenticity, accuracy and integrity of the Report.

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For more information concerning the social responsibilities of the Company, please visit the official website of Zhonghuan Semiconductor (https://tjsemi.solarbe.com/).

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