

ELECTRIC SHANGHAI 上海电气



THE BEST
IS YET
TO COME



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BELIEVING IN TODAY AND TOMORROW

In sci-fi movies, cars can both soar through the sky and dive deep into the ocean, making people fantasize about driving one to touch the clouds or swim alongside fish. The cleanliness brought about by the wide use of clean energy, the ubiquitous power grid and the convenience of smart living are the ultimate visions of the future world.

The door has already been opened to the era of vehicles powered by clean energy sources. Countries have set timetables for banning the sale of petrol cars: 2025 for the Netherlands and Norway, 2030 for India and Germany, and 2040 for France and the UK. Cleanliness, a revolutionary change, comes from new energy vehicles. With zero emissions and low noise, clean energy vehicles are bound to improve the quality of life.

Efficient energy use, such as driving a car by generating and recharging electricity, significantly improves energy efficiency compared to direct fuel use, and pollution can be centrally managed. Energy allocation is further optimized by intelligent charging networks.

In the second half of the "intelligent" scenario, technologies such as unmanned driving, precise positioning, and intelligent interaction have transformed the car into a mobile living, entertainment, and working space, opening up the future of travel to unlimited possibilities.

The road to the future has been laid out. From NEV parts to NEV thermal management system, from power battery automatic production line to whole vehicle plant design, Shanghai Electric is accelerating the development of the NEV industry with a unique approach.

Therefore, we proudly launch the cover story "Shanghai Electric's NEV Industrial Chain" to celebrate this great effort. We have firm belief in the future of a better life because we are deeply committed to it.

Shanghai Electric Group Co., Ltd.

Shanghai Electric Editorial Board

Honorary Director

Wu Lei

Honorary Deputy Director

Zhu Zhaokai

Director

Xin jian

Planner

Shen Jin

Editor-in-Chief

Tu Min

Add 2748 Pudong Dadao, Shanghai

Zip 200136

Tel 8621-20605605

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NEWS OVERVIEW

Lithium Equipment Garnered the Supreme Honor in the Field of Intellectual Property Management in China

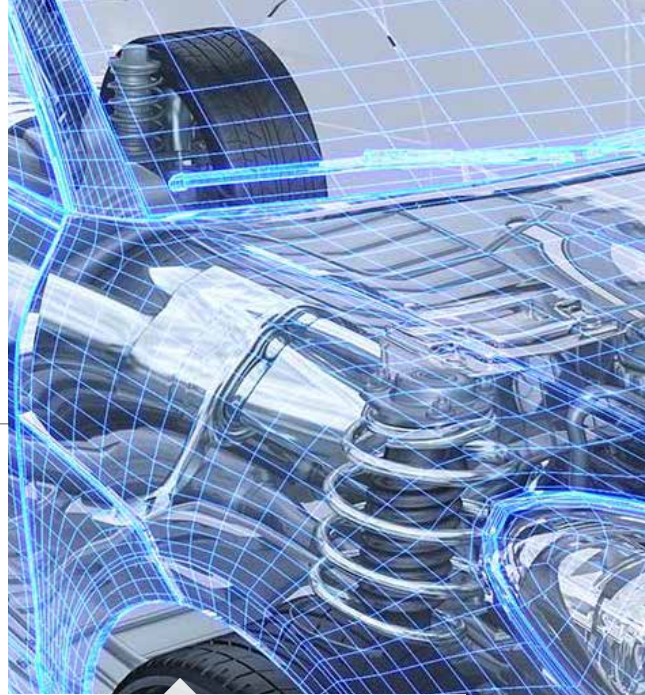
Shenzhen Yinghe Technology Co., Ltd. (hereinafter referred to as "Yinghe Technology"), a subsidiary of Shanghai Electric, has been awarded the title of "National Intellectual Property Advantageous Enterprise", one of the highest honors in the field of intellectual property management in China. This is not only an authoritative recognition of the company's ability to protect and utilize intellectual property rights, but also a high degree of affirmation of its innovation ability and R&D achievements in the field of lithium equipment. To date, Yinghe Technology has more than 2,600 intellectual property rights, including more than 190 invention patents, more than 1,200 utility model patents, more than 200 software copyrights and 4 international patents.

Shanghai Highly New Energy Technology* was Honored as One of China's Top 100 New Automotive Supply Chains

On October 24, the award ceremony of the 6th "Gasgoo Awards", organized by Gasgoo, was held in Shanghai. Shanghai Highly New Energy Technology Co., Ltd.* was honored as one of "China's Top 100 Automotive New Supply Chains of 2024" with its self-developed ETH45 new energy vehicle air conditioning compressor with 800V R134a/R1234yf refrigerant. This marks the industry's recognition of its continuous promotion of technological progress and industrial upgrading in the field of new energy vehicle components.

Shanghai Electric's Two Subsidiaries Listed Among the "Top 100 Enterprises in China's Electric Industry"

Recently, the press conference of the 20th China Electric Development Forum & the 24th China Electric Research Report on the Top 100 Enterprises in China's Electric Industry was held in Beijing. Shanghai Electric's Wujiang Transformer Co., Ltd. and joint stock company Schneider Shanghai Power Distribution Electrical Apparatus Co., Ltd. were shortlisted in the top 100 list, which means that the industry has recognized Shanghai Electric's comprehensive strength in the field of power transmission and distribution. The list, which is dedicated to China's electrical equipment manufacturing industry and based on national statistics, covers power T&D equipment manufacturing, power automation and control systems, new energy, industrial automation and drive, and other fields, and has become one of the most authoritative lists of electrical industry in China.





Shanghai Electric's Research Project Selected as the First Set of National Key Technical Equipment

The National Energy Administration recently announced the List of the Fourth Batch of First Sets of Major Technical Equipment in the Energy Sector. 77 projects were selected, including the first case of "300 MW coal power turbine generator utilization and transformation project to promote the function of synchronous condensers". Through the transformation, the turbine can have the dual functions of generator and synchronous condenser, with fast dynamic response to the performance index and reactive power output of synchronous condenser, and can flexibly switch the two operation modes of phase control and power generation according to the demand of the power grid, giving full play to the comprehensive efficiency of active support during high load period and reactive support during low load period, and effectively improving the regulation performance and capacity of the system. Currently, this technology has been successfully applied at Nanyang Yahekou Power Plant and China Resources Gucheng Power Plant.

Shanghai Machine Tool Works Won New European Orders

Shanghai Machine Tool Works Co., Ltd. (hereinafter referred to as "Shanghai Machine Tool Works") has taken another step in the overseas market and won an order for large-scale CNC crankshaft grinders from a European customer. Large CNC crankshaft grinder is the key equipment to high-end equipment manufacturing, which is widely used in automobiles, shipbuilding, energy and other industries, and requires high precision, quality and reliability of parts. With advanced technology, high efficiency and reliable stability, Shanghai Machine Tool Works stood out from many international competitors and won the favor of European customers.

Shanghai Electric Power Transmission & Distribution Achieves Major Order Breakthrough in Ultra High Voltage Market

Recently, Shanghai Electric Power Transmission & Distribution Group's Wujiang Transformer Co., Ltd. won the tenders for the supply of transformers for the State Grid Yangzhen Converter Station High Voltage DC Transmission Phase II Project ZZDFPZ-214000/230-200, the Aba-Chengdu East 1,000kV Ultra High Voltage Project 1,100kV Ultra High Voltage Reactor BKD-240000/1100-145, and the supporting Neutral Point Grounding Reactor JKDK-ε .0/145 project, marking the company's historic breakthrough in the UHV market.



NEWS OVERVIEW

Shanghai Bright-H Technology's Supporting Equipment Successfully Shipped to Shandong's First Photovoltaic Hydrogen Production Project

On November 6, one 2,000 Nm³/h alkaline electrolyzer and two 1,000 Nm³/h alkaline electrolyzer equipment from Shanghai Bright-H Technology Co., Ltd. were successfully delivered to the site of the first photovoltaic hydrogen production project in Shandong Province - the 120 MW Fishery Photovoltaic Complementary Project in Jiaozhou City's Ligezhuang Town. The electrolyzer of this project adopts advanced flow field design with more uniform temperature distribution, more efficient performance, wide range of adaptability and fast response, which can excellently solve the problems caused by the fluctuating working conditions of wind-solar hydrogen production. The product has passed the self-developed full-power test platform and obtained TÜV Rheinland certification before shipment.



PV Project in Skurtu, Romania Successfully Connected to Grid

Recently, the 56.03 MW PV project in Skurtu, Romania, undertaken by Shanghai Electric Power Generation Engineering Co., Ltd., has been successfully connected to the grid. This project is the second PV EPC project of Shanghai Electric in the Romanian market. Since the first pile foundation of the project was erected on April 30, 2024, the project has formally entered the main stage. The project team worked closely with all parties, fully communicating on equipment procurement and delivery, design control and construction subcontractor management, speeding up the project progress and solving all kinds of problems in a timely and efficient manner, accumulating replicable experience for the implementation of PV projects in the region.

World's First 300-Ton/Day Biomass Gasifier Shipped

Recently, the world's first 300 tons/day oxygen-fired pressurized fluidized bed biomass gasifier developed by Shanghai Boiler Works was successfully shipped, marking another major breakthrough for Shanghai Electric in the field of green energy. The delivered biomass gasifier is the core equipment of Shanghai Electric's wind power biomass green methanol integration demonstration project in Taonan City, which has the features of high operation flexibility, high gasification efficiency, strong fuel adaptability and low system energy consumption.



Hydraulic Test of Waste Heat Boiler of Rupsha Project Successfully Completed in One Attempt

Recently, the hydraulic test of No.1 waste heat boiler of Rupsha project in Bangladesh, commissioned by Shanghai Electric Power Generation Engineering Co., Ltd., was successfully completed in one attempt. After rigorous inspection, all pressure-bearing welds are free of wetting, seepage, leakage, and apparent residual deformation, and all technical indices meet standard requirements. The successful hydraulic test not only highlights the professional ability and technical level of the project team, but also lays a solid foundation for the subsequent pickling and pipe blowing work.

Successful Signing of Tibet's Integral Energy Station Project

Shanghai Environmental Protection Complete Engineering Co., Ltd. has successfully signed a contract for the Jezechake Salt Lake Lithium Extraction Integral Energy Station Project in Tibet. Located in the Ali region of Tibet, the project uses the current energy load of the existing capacity of the mining industry in Tibet and the local green energy to build a wind-solar-storage integration microgrid, realizing the balance of energy supply and demand of the microgrid. Upon completion, the project will help build an off-grid integrated generation, grid, load, and storage microgrid system in high-altitude and cold regions, alleviate local energy shortage, accelerate energy structure adjustment, and establish a wind-solar-storage demonstration project in the Ali region.

CSP + PV Project of Aksai Huidong Connected to Grid for Power Generation

Aksai Huidong's CSP + PV project, whose 110 MW electromechanical furnace auxiliary equipment and full set of main equipment were provided by Shanghai Electric Power Generation Group, has successfully connected to the grid for full power generation, marking the largest CT CSP project of the first batch of national "desert, Gobi and wilderness" projects to be formally put into production. The project has a total planned installed capacity of 750 MW, including 110 MW of photothermal power generation and 640 MW of photovoltaic power generation. The annual power generation reaches 1.7 billion kWh, which can save 507,000 tons of standard coal annually, and reduce the emission of many kinds of air pollutants, which is equivalent to planting nearly 80,000 hectares of forests. At the same time, as the first batch of large-scale base projects approved by the government in Gansu Province focusing on desert, Gobi and wilderness areas, its commissioning will play a positive role in demonstrating the development of the CSP industry.





MEDIA ATTENTION

CIIE Gives Impetus to Shanghai Electric's Sustainable Development

During the 7th China International Import Expo (hereinafter referred to as "CIIE"), Mr. Jia Tinggang, Vice President of Shanghai Electric Group, said in an interview with "CIIE Dialogue" hosted by People's Daily Online that global cooperation brings important opportunities to explore new technologies, services and projects, deepen scientific and technological cooperation, and promote the development of innovation. "CIIE has created a new platform for enterprises from all countries to open up and cooperate, promoting trade liberalization and economic globalization," Jia Tinggang said that CIIE provides a platform for Chinese enterprises to communicate with outstanding global enterprises. It promotes technological innovation, transformation and upgrading, expands international market and cooperation, and gives strong impetus to the sustainable development of enterprises. At present, green transformation and high-quality development have become a global consensus, which is essential for realizing sustainable development. This year's Government Work Report proposes to vigorously develop a green and low-carbon economy. Jia Tinggang said that Shanghai Electric has implemented the "dual-

carbon" strategy in three aspects: energy efficiency improvement, energy substitution, and resource recycling.

Jia Tinggang pointed out that Shanghai Electric has not only continued to consolidate its advantages in the traditional power equipment field, but has also made important breakthroughs in the nuclear power equipment manufacturing industry chain, the shipbuilding industry chain, the land transportation industry chain, the aerospace industry chain, the smart grid industry chain, and the oil, gas and chemical industry chain, which are strongly driving the industrial economy.

According to Jia Tinggang, in recent years, Shanghai Electric has comprehensively developed the smart grid, new energy automobiles and rail transit sectors, and has also been actively involved in the aircraft manufacturing process by providing key products and integration services, such as automated drilling and riveting systems and composite material systems. It is also involved in the production of key aircraft subsystems and components, as well as the research, development and production of specialized aerospace equipment, helping China's aerospace industry to build momentum. **D**



Shanghai Electric Held Seminar on the Development of Hydrogen-based Green Fuel Industry

On November 8, as one of the CIEE 2024 concurrent activities, under the guidance of Shanghai Municipal Development and Reform Commission and Shanghai Municipal Commission of Commerce, hosted by Shanghai Electric Group, and co-sponsored by Shanghai Huayi Group, SIPG Group, and Shenergy Group, the Seminar on the Development of Hydrogen-based Green Fuel Industry was held.

The seminar focused on the latest progress, market application and future development of the hydrogen-based green fuel industry, and promoted the healthy development of the industry by strengthening the exchange and cooperation within the industry. Jin Xiaolong, Member of the Party Committee and Vice President of Shanghai Electric, and more than 30 leaders and experts from domestic research institutes, consulting organizations, shipping companies and other enterprises in the hydrogen-based green fuel supply chain attended the conference.

Jin Xiaolong said in his speech that the development of hydrogen-based green fuel industry can not only partially replace traditional fossil fuels, but also transform unstable green

energy into stable energy, promote raw material production and utilization, open up new ways for low-carbon transformation of energy and chemical industries, and promote the development of upstream and downstream industries and economic growth. In recent years, Shanghai Electric has been serving the national "dual carbon" goals and unswervingly developing the hydrogen-based green fuel industry. It has independently developed an overall solution for hydrogen-based green fuel and launched a green methanol demonstration project in Taonan, Jilin Province. Taking the opportunity of this seminar, Shanghai Electric and industry partners will deepen technological innovation cooperation and strengthen policy and financial support to accelerate the development of hydrogen-based green fuel industry with a more open attitude.

During the seminar, Yu Hongmei, researcher of Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Yao Minfang, vice president of Shanghai Energy Conservation Association, Ni Jianjun, deputy general manager of Shanghai Boiler Works Co., Ltd. and Cheng Zhaopeng, general manager of Shanghai Wenji Biology, carried out in-depth exchanges. **D**



9 SHANGHAI ELECTRIC'S PROJECTS WON TOP SCIENCE AND TECHNOLOGY AWARD IN MECHANICAL SECTOR IN 2024



First Prize

Theory and key technology of high-performance energy mixed flow pump and its application in high-end equipment

【Shanghai Electric-KSB Nuclear Pump & Valve Co., Ltd.】
【KSB Shanghai Pump Co., Ltd.*】

Second Prize

Core equipment manufacturing technology of high safety and high reliability drive line for Guohe I and its application

【Shanghai No.1 Machine Tool Works Co., Ltd.】

Key technology and application of safety assessment and protection against water corrosion of steam turbine blade under high-temperature environment

【Shanghai Electric Power Generation Equipment Co., Ltd.】

Key technology and engineering application of high-efficient treatment of desulfurization wastewater in coal-fired power plants

【Shanghai Electric Power Generation Environment Protection Engineering Co., Ltd.】

Key technologies for the design and construction of double-layer vacuum chambers for fusion reactors with large, heavy and complex contours

【Shanghai Electric Nuclear Power Group Co., Ltd.】

Third Prize

Key technology of digital and intelligent operation and maintenance of heavy-duty gas turbine and its application

【Shanghai Electric Gas Turbine Co., Ltd.】

Development of the first exported Hualong I nuclear power steam turbine

【Shanghai Electric Power Generation Equipment Co., Ltd.】

Development and application of a complete series of large forgings for the main equipment of the Hualong I nuclear island, an advanced third-generation megawatt-class pressurized water reactor

【Shanghai Electric SHMP Casting & Forging Co., Ltd.】

R&D and industrialization of lightweight key technology for commercial high-efficiency, low-noise, frequency-converting rotor compressor

【Shanghai Highly Electrical Appliances Co., Ltd.**】

Recently, China Machinery Industry Federation and Chinese Mechanical Engineering Society released the "Machinery Industry Science and Technology Awards 2024". Shanghai Electric's nine projects won awards. Among them, the "theory and key technology of high-performance energy mixed flow pump and its application in high-end equipment" jointly developed by Shanghai Electric-KSB Nuclear Pump & Valve Co., Ltd. won the first prize of the Science and Technology Progress Award.

As the mixed-flow pump hydrodynamic pulsation and cavitation problems, large-scale operation inefficiency, vibration and other industrial challenges are increasingly prominent, the first prize project is the result of 15 years of hard work, which has carried out comprehensive, systematic and in-depth research and application of high-performance mixed-flow pump theory, key technology and high-end products. The project broke the foreign technology monopoly, realized the core technology localization of major industrial pump products, and is widely used in nuclear power, water conservancy and other fields by a number of backbone enterprises. It promoted China's high-end mixed-flow pump products localization process, playing a significant role in leading industrial development and technological progress, energy security, energy saving and consumption reduction.

The rest of the award-winning projects focus on serving the country's major strategies and are committed to promoting a high level of scientific and technological self-reliance. For example, led by Shanghai Electric, "the core equipment manufacturing technology of high safety and high reliability drive line for Guohe I and its application" has successfully broken the monopoly in terms of multiple materials and manufacturing technologies, reaching the international first-class level. "The development of the first exported Hualong I nuclear power steam turbine", led by Shanghai Electric, achieved design and manufacturing localization, with complete independent intellectual property rights, reaching the advanced third-generation technology level and making contributions to enhancing the overall level of China's nuclear power equipment.

It is understood that the Machinery Industry Science and Technology Awards are national comprehensive scientific and technological awards and also the highest science and technology awards for the machinery industry. A total of 430 prizes were awarded, including 1 special prize, 12 first prizes, 17 second prizes and 4 third prizes for technical inventions, and 4 special prizes, 28 first prizes, 180 second prizes and 184 third prizes for scientific and technological progress. **D**

New Breakthrough in COMPRESSED AIR ENERGY STORAGE

Recently, after winning the order for the complete set of equipment of high temperature molten salt heat storage system for Guoxin Huai'an compressed air energy storage project in Jiangsu, Shanghai Boiler Works Co., Ltd. (hereinafter referred to as "Shanghai Boiler Works") has successfully won the bid for the hot water heat storage system of the 2×350 MW salt cavern compressed air energy storage power generation project of Jintan Integral Energy Utilization Project of Huaneng Jiangsu Company. This marks a new breakthrough in the performance of large volume medium temperature water storage spherical tanks for Shanghai Boiler Works in the field of compressed air energy storage and achieves a full coverage of the performance of the entire series of heat storage products in this field.

Jintan Integral Energy Utilization Project is a national demonstration project. It is planned to build two sets of 350 MW compressed air energy storage units. The total energy storage capacity of up to 2,800 MWh, with its compression time and power generation time being 8 hours and 4 hours, respectively. It is a compressed air energy storage project with the largest capacity and the largest number of spherical tanks in China. According to the contract, Shanghai Boiler Works will mainly supply 16 sets of heat storage spherical tanks for the project. Once in operation, the project will greatly enhance the peak regulation capacity of the regional power grid, optimizing the national energy structure and promoting green development.

Under the guidance of the "dual carbon" goal, Shanghai Electric has deepened research, development and innovation, and successfully applied a series of new energy storage technologies in recent years, with great breakthroughs in the field of compressed air energy storage. Shanghai Electric has mastered integrated equipment solutions for compressed air energy storage systems ranging from 10 MW to 660 MW. These solutions can meet the needs of various compressed air ESS projects, enhancing the overall operational efficiency of ESS by optimizing equipment parameters. The group provides customers with stable, reliable, and serialized turbine generators, drive motors, heat storage systems, and heat exchange systems.

In the future, with the continuous progress of energy storage technology, efficiency improvement and cost reduction, the installed capacity of compressed air energy storage is expected to continue to grow. Shanghai Electric will firmly adhere to the innovation-driven development strategy, provide customers with more efficient compressed air energy storage system solutions, and contribute to the industrial restructuring and upgrading of the green economy. **D**



A Breakthrough in Wind Turbine Operation and Maintenance Technology! Aerial Large Parts Replacement

Recently, Shanghai Electric Wind Power Group Co., Ltd. Engineering Services (hereinafter referred to as "Shanghai Electric Wind Power Engineering Services") has independently developed the aerial 2MW blade replacement tool, which has successfully completed the replacement in Liaoning Gaizhou Shagangzi Wind Farm, marking a breakthrough in the aerial 2MW blade replacement tool.

Aerial 2MW Blade Replacement Tool is the innovation of Shanghai Electric Wind Power Engineering Services technical team after a long period of R&D and field testing. The whole set uses the ground winch equipment, with the specially designed auxiliary equipment and small ground cranes, to achieve the precise disassembly and lowering of the hub and blade. The innovative technology greatly reduces the site requirements for blade replacement, eliminating the need for large cranes, breaking through the site limitations and land acquisition difficulties in the traditional methods, and significantly reducing the cost.

The technical team was formed in 2019 specially for the aerial replacement of large parts of the wind turbine. Since its inception, the team has developed many tool sets, such as the DD Direct Drive Transformer Aerial Replacement Tool, the 2MW Pressure Shaft Tool, and the Direct Drive Coiler, and has continued to innovate and increase the efficiency of large component replacement. **D**



640,000 KW Wind Power Project in Northeast, North and Northwest China

Recently, the announcement of the public bidding result for the 2.64 million kilowatts coal power and new energy integration project in Northeast, North and Northwest China showed that Shanghai Electric Wind Power Group Co., Ltd. (hereinafter referred to as Shanghai Electric Wind Power) successfully won the bid for the 640,000 kilowatts wind power project of Lot 3. The project's Zhuoyue platform wind turbine is the latest product family launched by Shanghai Electric Wind Power for the onshore wind power market, with the power of 5 MW to 10 MW, the wind wheel diameter level of 202 meters to 230 meters, advanced technology, high reliability, wide market coverage, lifecycle digital support, customized wind farm services and other features. **D**

Shanghai Electric Wind Power Won Bid for Inner Mongolia Wind Power Project

Recently, the winner of the public bidding for the wind turbines and ancillary equipment (secondary) for Datang's Abag Qi wind power project in Inner Mongolia was announced to be Shanghai Electric Wind Power Group Co., Ltd. (hereinafter referred to as Shanghai Electric Wind Power). This is another cooperation between Shanghai Electric Wind Power and Datang Group in Inner Mongolia this year after Datang's Sonid Zuoqi 200MW wind power project in Inner Mongolia. Shanghai Electric Wind Power will provide onshore Zhuoyue platform turbines and related services for this project. **D**



COVER
TOPICS

THE BEST IS YET TO COME



China is one of the largest automotive markets in the world, presenting vast opportunities in its leading new energy vehicle (NEV) market. According to the New Energy Vehicle Industry Development Plan (2021-2035), by 2025, NEV sales in China are expected to reach approximately 20% of total new car sales. After 15 years of sustained efforts, China's NEV core technology will achieve international advancement, with strong global competitiveness in terms of quality and brand.

As a leading comprehensive equipment enterprise, Shanghai Electric is responding to national strategies and market demands. It is rapidly optimizing its NEV industry layout and fostering innovation through mergers and acquisitions. Currently, Shanghai Electric has established a comprehensive NEV industrial chain that includes vehicle plant design, automated power battery production lines, NEV parts, and NEV thermal management and vehicle AC compressor systems.

Shanghai Electric's development has been significantly influenced by key customers from the traditional automotive industry. With advanced technology and a strong customer base, Shanghai Electric, a traditional supplier to the automotive industry, has quickly secured its position in the market. This success is attributed to the introduction of new products, the exploration of new business opportunities, and the fostering of new partnerships, following the development of new capabilities in the emerging NEV industry.

The future is dawning. On the magnificent journey of the NEV industry, Shanghai Electric Group will continue to progress—whether steadily or vigorously—toward its goal, believing that the best is yet to come.

STRENGTHENING COMMITMENT TO MARINE
ENVIRONMENTAL PROTECTION IN THE ERA OF
GREEN SHIPPING

WITH FOUR YEARS OF EXPERIENCE IN THE AUTO PARTS BUSINESS, IT HAS BECOME THE FIRST TRULY INTERNATIONALIZED AND DIRECTLY MANAGED BUSINESS TEST FIELD FOR SHANGHAI ELECTRIC.

HIGHLY MARELLI*: TO BECOME THE WORLD'S LEADING INTELLIGENT AUTOMOTIVE THERMAL MANAGEMENT SYSTEM SUPPLIER

Learn More

Shanghai Highly (Group) Co., Ltd. *(hereinafter referred to as Highly Group*), a subsidiary of Shanghai Electric Group, issued A and B shares on the Shanghai Stock Exchange in 1992 and 1993, respectively. It is a global leader in the R&D and manufacturing of core components for white goods, NEVs, and heating and cooling products. It operates in two major sectors: "Heating & Cooling Solutions and Core Components" *and "Auto Parts" *, serving hundreds of millions of households in 165 countries and regions worldwide.

As the world's largest manufacturer of non-self-supporting household AC compressors, Highly Group* has been pursuing industrial transformation and breakthroughs in recent years. It has successively expanded into new sectors such as electrically driven compressors (EDC) for NEVs and auto parts castings. Building on its four core strengths—technological research and development in electromechanics, large-scale lean manufacturing management, large-scale operational cost control, and an extensive customer base in intermediate products—Highly Group *has strategically positioned the auto parts business as a key development industry segment. It is also actively seeking new opportunities in this industry.

On August 29, 2019, Highly Group* and Marelli Group signed a "Memorandum of Intent for Cooperation". Marelli is one of the world's leading independent global suppliers in the automotive industry. On September 4, 2020, Highly Group* and Marelli formally signed a joint venture agreement for the auto parts project. They also established Marelli Hong Kong as the main body to integrate the target assets and business. Highly Group* acquired 60% of the shares in Marelli Hong Kong, and the joint venture company was named Highly Marelli Holdings Co., Limited*. On January 28, 2021, Highly Group* and Marelli completed the business transfer.

As a global automotive systems supplier, Highly Marelli* owns 22 factories and 4 R&D/ Technical Service Centers across 12 countries. It employs approximately 3,100 people worldwide and has an annual revenue of about RMB 5 billion. It is committed to leading the cabin comfort industry. In addition, it focuses on developing world-class solutions for both customers and suppliers. Its main products include HVAC modules, compressors, heat pump systems, etc. Its major customers include Nissan, Renault, and Mitsubishi, as well as other companies like Suzuki, Honda, Isuzu, Mazda, and various Japanese automakers. Additionally, Highly Marelli* serves NEV manufacturers such as Geely, GWM, Dongfeng Mhero, Dongfeng Voyah, BYD, Xiaopeng, Rivian, and others.

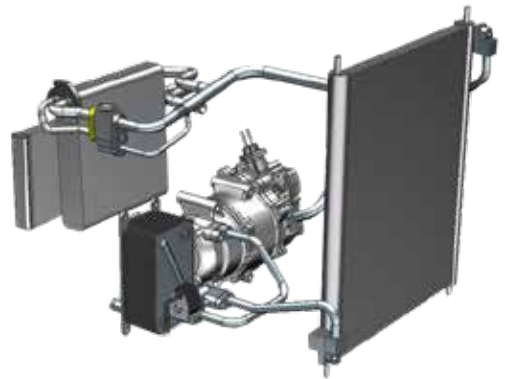
JOINT DEVELOPMENT WITH OVERSEAS TEAM

China is the world's largest automobile market and producer. With the continuous technological development of independent brands, particularly in the new energy vehicle (NEV) sector, the market share of Chinese brands is steadily increasing. This presents huge opportunities in the world-leading NEV market.

Shanghai Electric is committed to becoming a world-class enterprise. To achieve this goal, it has adopted an open and coordinated approach, focusing on win-win cooperation. It has strengthened its global business portfolio, integrated resources, and expedited the global expansion of its equipment, production capacity, and assets. It has also worked towards integrating its overseas business with the dual circulation development pattern, which connects both domestic and international economic cycles. By operating in an open and cooperative environment, Shanghai Electric has sought opportunities to enhance its capacity and performance, ultimately leading to sustainable development with a win-win mindset. Shanghai Electric aspires to be a leader among Chinese enterprises in "going global" and to represent the highest standards of "Made in China."

The combined forces of Shanghai Electric and Marelli have provided Highly Marelli* with an accelerated global presence in the automotive AC compressor and HVAC system business, as well as world-class R&D capabilities and customer resources. This collaboration has helped it become one of the top automotive parts suppliers in the world.

However, new challenges have arisen in these new business areas. Highly Marelli* employs people in countries around the world, including Japan, the United States, Thailand, Malaysia, India, South Korea, the United Kingdom, Spain, and more. Managing this "overseas workforce" was the first challenge Highly Marelli* had to address.



The first two years of operation coincided with a period of strict pandemic control, which slowed down the development of factories and R&D centers around the world. Additionally, differing cultural backgrounds, ways of thinking, and management processes posed significant challenges. Even more challenging was the fact that many of the company's original projects were operating at a loss, as Nissan had stopped providing subsidies. As a result, reducing losses has become a top priority for the new company.

What did Highly Marelli* do? Firstly, it increased efficiency, accelerated the pace of transformation, and enhanced quality. While continuing to serve Nissan, it expanded its customer base. At the same time, it strengthened budget and cost management and optimized and re-engineered its supply chain management process. It also comprehensively promoted standardized and lean production throughout the company. This approach ensured that the company achieved results where one plus one was greater than two. Secondly, it streamlined and optimized its talent team. It selected outstanding individuals from around the world. These individuals are expected to be capable of operating both domestically and internationally. Thirdly, it promoted technological innovation. Deeply rooted in China, Highly Marelli* integrates global resources to establish global R&D centers and build factories for key components in China. It aims to better serve the vehicle thermal management system market with world-leading products and technologies.

Fourthly, it focused on strengthening corporate culture. Through a series of communications and activities, the company reframed its mission, vision, and values to gradually align them across the company.

Highly Marelli* Top Management believes that companies will inevitably face cultural differences in their overseas operations. It is essential for the management team to consider the cultural characteristics of various regions. Highly Marelli* is committed to enhancing the sense of belonging and unity among employees, stimulating self-motivation, and improving relationships between shareholders, the company, and employees. Through technological innovation, Highly Marelli* provides customers with better and more advanced green products.

In the future, the company will continue to strengthen its global manufacturing and R&D capabilities in automotive air conditioning compressors and systems, rapidly evolving into a major player in the automotive parts and components industry. This will establish Highly Group's* "second main business." It will also accelerate its expansion into the field of new energy auto parts, aiming to achieve its three development transformation goals: "from household appliances to auto parts, from core components to system integration, and from a domestic market orientation to an international business network."

Shanghai Electric Group has high expectations for its overseas companies. Mr. Wu Lei, Chairman of Shanghai Electric Group, stated during his visit to Highly Marelli (Thailand) Co., Ltd.* on August 8, 2024, that Thailand is the largest automobile producer in Southeast Asia and a high-potential sales market. It is currently upgrading from traditional production methods to a modern automobile industry focused on high energy efficiency. As one of the first internationalized industrial groups of Shanghai Electric, Highly Group* should expand its presence in international markets and capitalize on regional advantages and transformation opportunities. It should also promote the globalization of production and strongly support Shanghai Electric's "going out" initiative to further the Group's internationalization strategy.

SEIZING THE OPPORTUNITIES OF THE AUTO PARTS INDUSTRY

From the perspective of technological development trends in the automotive thermal management industry, the "four key directions" for future development are: efficiency in response speed and accuracy, integration to enhance overall performance and reliability, intelligence for automatic regulation and optimization, and environmental friendliness through the use of eco-friendly materials and processes to reduce the use and emission of harmful substances.

Highly Marelli* embodies the innovation gene of Shanghai Electric as an acquired international company. As an automotive supply chain company, it embraces various approaches to innovation. Currently, Highly Marelli's* global R&D team, comprising over 300 people, is focused on reducing costs and enhancing system efficiency in preparation for the product launch in 2026.

With the rapid growth of NEVs, NEV technology is evolving quickly, and energy supplementation has become the biggest challenge for the driving experience. The most effective way to address this challenge is to develop super-fast charging, which has become the industry consensus.

Highly Marelli* recently released its latest thermal management system products for NEVs. At the core of this system is heat pump technology. This technology integrates Highly Group's* ultra-high-efficiency scroll electric compressor and HVAC technology. This significantly improves the energy efficiency ratio of air conditioning and can greatly extend the driving range of NEVs in winter. The system also features a unique control function that enables the heat pump to perform cooling, heating, dehumidification, and defrosting functions. Its high integration further enhances the vehicle's ride quality.

Operating environments have been expanded to support global markets, and system security has been greatly improved. Thanks to the excellent performance of these system products, Highly Marelli* has already reached out to leading automobile OEMs in Europe, the United States, and Japan, as well as major emerging automobile manufacturers in China to promote system matching projects.

It is known that Highly Marelli*, through



collaboration and innovation between its Chinese and Japanese technical centers, has developed the first four-temperature-zone air conditioner. However, the market is still largely dominated by two-zone temperature control. In the near future, intelligent human-vehicle interaction will become a reality. For instance: "I feel cold. Can you turn up the temperature on the right side of the back row?" "OK, adjusting now." In the near future, the smart air conditioning system will observe, think, talk, and serve.

With core value of customer-focus and in partnership with leading Chinese NEV enterprises, Highly Marelli* has continually improved its understanding of customer needs. "Even with the customer's conceptual framework requirements, we can still create products with clearer objectives through the exchange."

Highly Marelli's* technology development plan

is very clear. In the research and development of the eco-friendly refrigerant integration module, the goal is to design a compact and lightweight system by optimizing the thermal management system architecture and integration module. To improve the energy efficiency of the thermal management system, the number of pipelines and components will be reduced by optimizing the integration module's efficiency. Research into the thermal management system control algorithm will enable decoupling design between the algorithm and integration module. This will enhance the integration module's capacity across different vehicle platforms.

Highly Marelli's* years of dedication will usher in a harvest in 2029. For the R&D team, the next two years are crucial. With a focus on developing new customers and increasing its share of the existing market, Highly Marelli* is poised to meet the global demand in full.



EXPANDING THE TERRITORY TO CREATE NEW MOMENTUM

On April 30, 2024, the Highly Marelli China project was landed in Wuxi. Built on the existing land of Highly Marelli* (Wuxi), this project will focus on providing customers with automotive electric compressors, heat pumps, HVAC systems. It will also focus on providing comprehensive solutions for new energy intelligent thermal management systems.*

The benchmark precision production management mode is outstanding in the Highly Marelli* Wuxi plant. For orderly management, the key principles are cleanliness, orderliness, clear responsibilities, and defined boundaries. Pedestrian and vehicle traffic lanes are clearly separated in the park. In the production area, boundaries are well-defined, materials are neat and tidy, enabling on-site personnel to identify them at a glance.

The management system is simplified and centered around SPQRC. Calling devices are in place to ensure a quick response on-site. The standardized production operating system ensures that instructions are concise, clear, and efficiently communicated. Standard operating documents, along with the yamazumi chart, are used to identify waste. To manage both processes and targets simultaneously, emphasis is placed on improving the first-pass yield of product quality. The first-pass yield rate is introduced as a key quality indicator by shifting quality control to earlier processes, underscoring the importance of improving quality control effectiveness.

Highly Marelli's* management emphasizes that there is always room for improvement in lean management. As a benchmark for lean production, the company continues to optimize production management. It strives to exceed customer

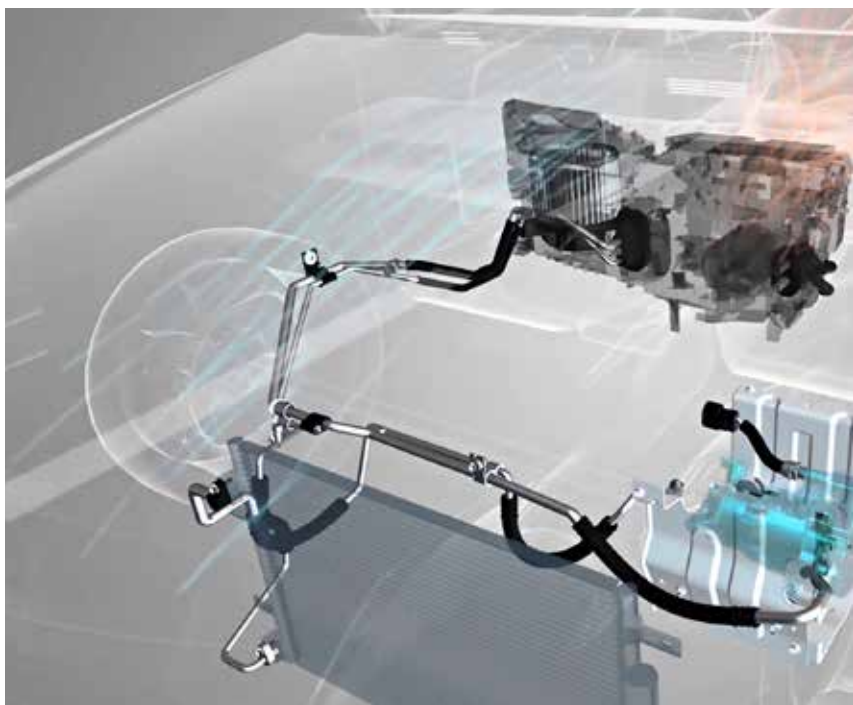
expectations with its services.

Recently, Highly Marelli's* Wuxi Plant passed the green carbon footprint certification and energy audit. It received the official certification and report. This certification allows Highly Marelli* to fully assess the energy consumption and carbon emissions of its products. This has a significant impact on the company's low-carbon management, energy savings, emission reductions, and cost control efforts.

The carbon footprint accounting and energy audit serve as the foundation for the company's Green Factory application. They also provide strong technical support for the environmental sustainability of the company's key products throughout their life cycle.

The Highly Marelli* Wuxi Plant demonstrates that lean management is about organizing production activities to deliver value to customers through a scientific and efficient manufacturing system. This approach reduces production cycles and significantly enhances the company's ability to adapt to market changes.

Starting from Wuxi, heading east to west, located in the Wuhu Economic & Technological Development Zone (WEDZ), Wuhu Highly Marelli* Automotive Thermal Management System Co. Ltd. (hereinafter referred to





as "Wuhu Plant") is a key base in the development of the new energy automotive parts industry cluster. Covering an area of approximately 150 mu, this project is divided into two phases. Phase one began construction in September 2021 and was completed in May 2022. The first production line started operating in June 2022.

The Wuhu New Energy Project has an investment of RMB 2.5 billion and a planned land area of 13.33 hectares. It will produce 5 million new energy vehicle compressors upon completion. Together with Highly Marelli's* heat exchanger and air conditioner assembly plants in Wuhu, it will form the group's largest automotive parts production base.

In 2023, Shanghai Highly (Group) Co., Ltd.* further accelerated the development of the Wuhu Plant. It also established the Wuhu Auto Parts Industry Cluster and enhanced the overall competitiveness of the auto parts industry. With the commissioning of the Wuhu Plant, the annual production capacity of Shanghai Highly (Group) Co., Ltd.* automotive electric compressor will increase to 1 million units. This will further support the rapid mass production and delivery of newly awarded domestic and international new energy automobile projects. It will also reinforce the company's position as a leading global provider of intelligent thermal management system solutions and core components.

Currently, Highly Anhui's* automotive castings have received new nominations from customers such as Schaeffler, ThyssenKrupp, Hengli Group, and others. Mass production has also commenced for clients including Valeo, Fast, Brembo, and others.

Besides, Mr. Dong, Executive Vice President of Shanghai Electric and Chairman of Shanghai Highly (Group) Co., Ltd.*, highlighted the continuous improvement of the company's presence in North America and its steady business growth. Mr. Miao, President of Shanghai Highly (Group) Co., Ltd.*, emphasized that Highly Group* will further strengthen its support for North American business. He also emphasized that Highly Group* would continue to invest in overseas R&D, sales, and new product development to further the growth of its auto parts business in the region.

To enhance the travel experience and promote a low-carbon lifestyle, Highly Marelli* will continue to uphold the concept of green development. It will also support various enterprises in their ongoing research and efforts in environmental protection and sustainable development, working together to foster a more eco-friendly and efficient industry.



STEADY DEPLOYMENT FOR BREAK-EVEN NEXT YEAR

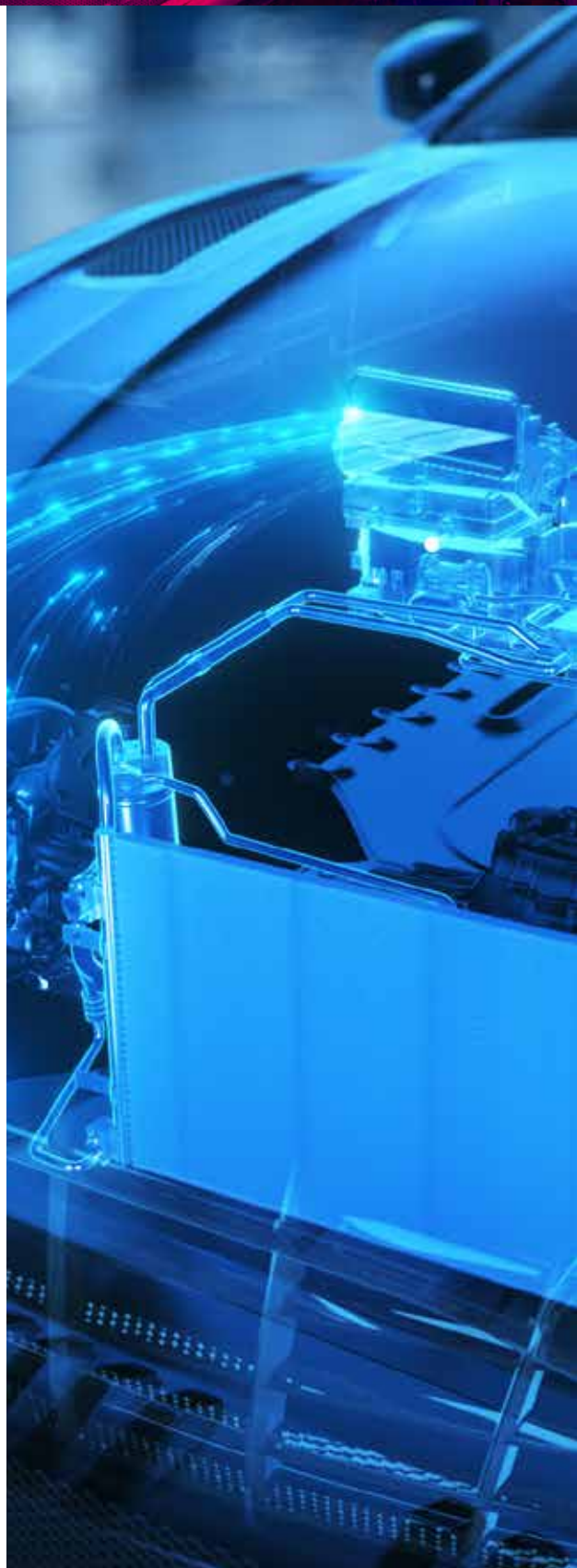
Data shows that global thermal management system suppliers fall into three categories. The first category includes the four major global suppliers—Denso, Hanon, Valeo, and Mahle—which together account for approximately 60% of the global market share. The second category comprises medium-sized global suppliers such as Highly Marelli, Sanden, Doowon, Autecar, and others. The third category mainly consists of Chinese suppliers, including Yinlun, Songz, Yuxin, Chaoli, Sanhua, FinDreams, and Xiezhong.*

Highly Marelli's* target markets include China, Japan, North America, Europe, and South Asia. China, as the world's largest market for NEVs, will be the focal point of its business expansion. Japan and Europe will remain key markets for steady growth, while North America and South Asia will see active expansion based on existing business operations. HVAC will continue to be Highly Marelli's* core business and main area of expansion. It plans to increase investments in electric compressors and thermal management integration modules, aiming for these to become key business pillars in the near future.

Highly Marelli's* development strategy, focusing on electrification and intelligence, promotes the coordinated development of both traditional fuel vehicles and NEV businesses. By enhancing product competitiveness and core technology, it aims to drive sales growth, improve profitability, expand its customer base, increase operational efficiency, and create a virtuous cycle that promotes both scale and efficiency.

According to external reports from financial media, Highly Marelli* has implemented a series of in-depth reform measures. It strictly adheres to the general principle of "controlling losses, pursuing development, and ensuring implementation." It has also taken effective management improvement steps, achieving remarkable results in enhancing profitability and market competitiveness. As a result, it reduced losses by 138 million yuan in 2024 compared to 2023. At the same time, Highly Marelli* has continued to promote new products and market development. These efforts have laid the foundation for future growth through the launch or mass production of several projects.

Against the backdrop of the current economic environment and industrial changes, 2025 will be a pivotal year in Highly Marelli's* development history. With a focus on achieving success while maintaining stability, Highly Marelli* will concentrate on three key areas: "Strengthening Strategy, Expanding Market, and Improving Efficiency." It aims to break even and achieve sustainable growth. This will create greater value for customers, deliver higher returns for shareholders, and ensure steady progress in the fiercely competitive market. **D**





RESILIENT AUTOMOBILE INDUSTRY

By Wei li

With a slowing economy, an aging society, and the rise of AI, the world has never been more complex, offering both endless opportunities and great challenges.

Is today's automotive business as simple as it used to be? Automobiles and technology are both complementary and independent of each other. Where will science and technology take the automotive industry? Even experts are somewhat uncertain. However, one thing is clear: The automotive industry is resilient. Despite facing numerous challenges, China has managed to carve out a new path for its automobile industry. The automobile industry has become a pillar industry in China, driving employment and receiving strong support. It will continue to be a shining star.

On November 11, 2024, Chen Jining, the Shanghai Municipal Party Secretary, and Gong Zheng, Deputy Secretary of the Municipal Party Committee and Mayor, in alignment with the spirit of the Third Plenary Session of the 20th CPC Central Committee and the Fifth Plenary Session of the 12th Municipal Party Committee, conducted special research at SAIC Group, a leader in Shanghai's automobile industry. During this visit, they held a symposium to further deepen their study and promote the transformation of SAIC. Mr. Chen Jining emphasized the need to effectively strengthen comprehensive reform. He also pointed out the importance of a strong sense of mission, honor, responsibility, and urgency. He called for an unwavering focus on the main tasks, self-revolution, and the implementation of innovation and transformation to continually enhance core competitiveness. These efforts will contribute significantly to the high-quality development and modernization of Shanghai. This statement serves as a guiding principle for upstream and downstream enterprises in the automotive industry chain.

Sometimes, direction is more important than effort. It is very important to believe in this principle, both in the big picture and on a personal level. To continue advancing, Shanghai Electric will initiate high-level cooperation in the fields of new energy and thermal management systems, driven by technological innovation. This demonstrates its strong confidence in the future and highlights its deep commitment to technological innovation, mission, and responsibility.

We believe that technology can change lives. Technological empowerment will change the competitive landscape of the automotive industry. The automobile of the future will be safer, smarter, more eco-friendly, and more affordable. Through research and development in technology, transformation, and upgrading, we are bound to usher in a brighter future. **D**

Shanghai Electric Helps Innovative German Firm Survive Difficulties and Achieve Sales Leap

“ JOINING A LARGE CHINESE COMPANY IS LIKE JOINING A BIG FAMILY ”

Formula 1 racing fascinates spectators around the world. What most spectators don't know is that in every car that goes at lightning speed there is a device similar to a "flip-flop", which is the "strongest" part of the car. It weighs only 7 kg, but can withstand an instantaneous impact of 12.5 tons, equivalent to the impact of a double-decker bus.

Even fewer people know that "HALO", the official name of the device, is closely associated with Shanghai. In 2017, Shanghai Prime Machinery Co., Ltd. (hereinafter referred to as "Shanghai Prime Machinery"), a subsidiary of Shanghai Electric Group, through its wholly-owned subsidiary Nedschroef, headquartered in the Netherlands, acquired CP Tech, an innovative German company and the main supplier of HALO.

Why would a Shanghai state-owned enterprise go to great lengths to acquire an innovative German company ?

Finding "New Opportunities" in Overseas Markets

The answer is obviously not limited to F1 racing cars.

the
HALO



Walking through the door of CP Tech's headquarters in Paderborn, Germany, a HALO-equipped Formula 1 car catches the eye of every visitor. But Stephen Ludwig, the company's COO, says: "HALO is just one part of CP Tech that demonstrates our ability to produce extremely precise components for special scenarios."

On the CP Tech production floor, there are sights to behold: The frame-type body designed for the supercar replica not only restores the original car in a 1:1 ratio, but also greatly increases its strength. The four-wheel alignment gauge, the Setup Wizard, can measure F1 race cars without lifting them, which can reduce the working time from three or four hours to one hour. The landing gear and fuselage frames designed for manned aircraft, flying cars, etc. in the low-altitude economy, some of which have already been certified for test flights in many European countries and regions, will enter mass production in succession.

CP Tech's design and production capabilities in special vehicles, aerospace and other special fields are the main reasons why Shanghai Electric Group extended an olive branch.

Blades, bearings, cutting tools and fasteners are the core products of Shanghai Prime Machinery's parts and components business. They were developed and produced domestically for domestic customers. In 2014, in order to deepen the reform of state-owned enterprises and implement the "going out" policy, Shanghai Prime Machinery acquired 100% of the shares of Koninklijke Nedschroef Holding B.V. The latter is one of the world's leading manufacturers of automotive fasteners and has a long history of working with Volkswagen, BMW, Audi and other automotive giants. After being incorporated into Shanghai Prime Machinery, Nedschroef has realized the synergistic sales of fasteners, bearings and other products in the automotive field, and improved technology, effectively enhancing market competitiveness.

The "going out" policy is also continuously being optimized in line with market trends. After entering the auto parts market through Nedschroef, Shanghai Electric Group saw a broader market opportunity. As Internet of Things, autonomous driving

and other emerging technologies drive the transformation of the automotive industry, it is necessary to introduce innovative products in the early stages of automotive design and manufacturing and even related industries.

Fasteners and bearings are already part of the traditional business, and new impetus is needed for new business growth. After some research, CP Tech came into the sight of Shanghai Electric Group. As an innovative company, it has close cooperation with high-end racing cars and supercars. Part of Porsche's frame and safety cage, Mercedes-Benz AMG supercar's drive system, Lotus supercar's driveshafts, etc. are all made by CP Tech, and HALO used in F1 racing cars is one of the company's representative works.

"CP Tech is located in the center of Europe. Through increasing internal synergies and cooperation with other business units of Shanghai Electric, a stable win-win or even multi-win situation of benign development, market insight and technological advancement can be achieved to open up a new space for business in the global market," said Wu Lei, Secretary of the Party Committee and Chairman of Shanghai Electric Group.

JOIN THE "BIG FAMILY" OF SHANGHAI ELECTRIC GROUP

CP Tech was selected by Shanghai Electric Group to expand its business scope and seize market opportunities, so why did CP Tech agree to partner with this state-owned enterprise?

"Because of its sincerity, openness and clarity," replied Thomas Casey, founder and CEO of CP Tech. Everyone can see what the CEO is doing in his glass-walled office: "Sincerity and openness are also part of our corporate culture, and I think the corporate cultures of Shanghai Electric and Shanghai Prime Machinery are very similar to ours. These qualities are not as strongly felt with other potential acquirers."

Back in 2017, CP Tech was just a startup that desperately needed external forces for sustainable growth. There were a number of potential acquirers at the time, including

COVER TOPICS

Shanghai Electric Group. As Casey communicated with the acquirers, he found that many of them just wanted to make an investment, did not care about what CP Tech was doing, and just hoped that CP Tech could present an impressive balance sheet after the acquisition so that they could get a good return when it changed hands again.

"But Shanghai Electric was different. It valued what we could do and what we could do together when we joined Shanghai Electric, and it didn't pursue short-term financials." When Casey first got in touch with Shanghai Electric, he hadn't been to China and only knew through the news that the country was growing fast and had great potential. After being invited to Shanghai, he found Shanghai Electric Group and Shanghai Prime Machinery to be sincere and open: "There are many whimsical research ideas in technology-based companies, and you can't predict the outcome. But Shanghai Electric accepted our innovative ideas, and also clearly expressed that the acquisition was not for short-term financial data, but rather for the synergistic development." Shanghai Electric Group also said that after the acquisition, it would give CP Tech full authority to support the company to develop at its own pace.

"Then Shanghai Electric it is, then!"

When Casey informed management and employees of the communication process and the decision to accept the acquisition, it was unanimously endorsed. Ludwig also remembers the scene: "We were all very happy because the acquirer was a large company from China, a partner who wanted to grow with us, and it was like joining a 'big family'."

CP Tech soon felt the warmth of the "big family".

At the end of 2019, Covid-19 began to spread around the world. Paderborn is a three-hour drive from Frankfurt, with a population of only 140,000. The pressure of pandemic prevention and that of the market downturn posed a big challenge to CP Tech. Just then, CP Tech received supplies such as masks and other pandemic prevention materials from China,

as well as concrete and practical experience in pandemic prevention. More importantly, when the virus dealt a severe blow to the global economy, Shanghai Electric Group provided CP Tech with sufficient financial support until the end of the pandemic.

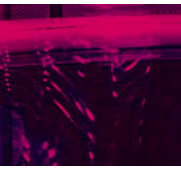
"Fortunately, we made the right decision," both Casey and Ludwig were grateful for choosing Shanghai Electric Group, "At that time, there was so much uncertainty. We didn't know how long the pandemic would last, how long the market downturn would last, how long the flights between China and Germany would be suspended... In Europe, many small and medium-sized enterprises like us went out of business, but we survived with the support of our parent company."

After the pandemic subsided, CP Tech quickly resumed production and, as expected, established a positive interaction with many members of the Shanghai Electric "family" and realized rapid development. As the data shows, CP Tech's sales reached 33 million euros in 2022, increased significantly to 41 million euros in 2023, and are expected to rise to 46 million euros this year.



THE DUAL CIRCULATION DEVELOPMENT PATTERN

"A sale of over 40 million euros is insignificant to the parent company, but we want to repay their support during the extraordinary period by working with them to expand into a larger market," said Zhu Haohua, head of CP Tech China.



He was CP Tech's first Chinese employee, recruited by Casey after CP Tech was acquired by Shanghai Prime Machinery, and helped the company set up a representative office in Shanghai's Hongqiao Business District, traveling frequently between China and Germany. "The reason I joined CP Tech is somewhat similar to why CP Tech joined Shanghai Electric. What attracted me most was the company's practical attitude." In just a few years, Zhu Haohua, with the support of Shanghai Electric Group and Shanghai Prime Machinery, has helped CP Tech find many partners in China and provided many Chinese companies with opportunities in overseas markets.

In the production workshop, Casey showed the reporter a high-performance needle roller bearing with a very complex structure. Originally, all the components were made by CP Tech. But soon, one of the components will be processed by Shanghai Zhenhua Bearing Factory Co., Ltd., a subsidiary of Shanghai Electric Group. This small change can halve the cost while maintaining the same quality, making the product more competitive.

CP Tech also has a presence in China's booming low-altitude economy. Through cooperation with affiliated companies of Shanghai Electric Group, CP Tech and its partners have achieved new results in the research, development and production of aviation bearings, aviation fasteners and

other components.

China's support has made many of CP Tech's innovative ideas possible. Setup Wizzard was originally designed for racing cars, but CP Tech has always wanted to enter the civilian car market with visualization software to make the product more intuitive. China's mature and developed software industry leads the company to believe that "with the participation of Chinese partners, more products will flow in both directions between China and Germany."

CP Tech's German employees have also gained a new perspective on China through projects that fully reflect the "domestic and international dual circulation". Vivian Tim is responsible for the strategic alignment between the company, Nedschroef and Shanghai Prime Machinery. She came to Shanghai for the first time this year and was impressed by the hospitality of her Shanghai colleagues. "In Germany, we sit around a long table and you can only communicate with the people next to you and across the table. But when my colleagues in Shanghai invited me to dinner, we sat around a round table and could communicate with everyone and talk about all kinds of things, just like a family. It felt great!"

The small German company is gradually being infiltrated by more Chinese elements. Thomas Casey and Zhu Haohua each wear a Chinese-style beaded bracelet. When asked about the reason, Zhu Haohua smiled and said, "Thomas is a person who is open to new things. He asked me what I was wearing on my wrist, and I told him it was a Chinese ornament believed to represent good luck. He thought it was nice and asked me to bring him one from China, and he's been wearing it ever since." Casey also smiled and said, "The company has really gotten better since I started wearing it. It is China that has brought us good luck." **D**





VIEWPOINTS
INTERVIEWS

A MOTOR EXPERT

Z h o u

ZHOU AIHUA

SENIOR TECHNICIAN OF MOTOR ASSEMBLY, CHIEF TECHNICIAN AND ONE OF THE FIRST SPECIAL TECHNICIANS OF SHANGHAI ELECTRIC GROUP, AND CURRENT ASSEMBLY SECTION CHIEF OF HIGH-SPEED MOTOR PLANT OF SHANGHAI ELECTRIC MACHINERY CO., LTD. HE WAS AWARDED THE SPECIAL STATE COUNCIL ALLOWANCE IN 2023.



Winter has come and it is going to be cold. The pipeline system of the West-to-East Gas Pipeline Project, which runs from east to west and from north to south in China, is officially ready for winter.

On November 12, gas began flowing eastwards as far as Shanghai, from the production wells of the Kela 2 gas field, the "heart" of the Project. It will arrive at Shanghai Electric Machinery Co., Ltd., the birthplace of the first set of localized motors and the 20 MW ultra-high-speed explosion-proof variable frequency synchronous motor for the West-to-East Gas Pipeline Project.

"I cannot express in words the sense of achievement I feel when I see these motors running stably all over the country," Zhou Aihua, the assembly section chief of the High-speed Motor Plant, was overwhelmed with emotion. In the localization process of the first set of 20 MW ultra-high speed explosion-proof variable frequency synchronous motor for the West-to-East Gas Pipeline Project, Zhou Aihua demonstrated excellent technical ability and developed a detailed assembly program to address the challenges of high gas tightness and extremely strict assembly requirements of the ultra-high speed synchronous motor. By improving the sealing materials and optimizing the assembly process, he ensured the stable operation of the motor. This achievement not only broke the technical monopoly of multinational companies, but also effectively reduced procurement costs, making an important contribution to national energy and economic development.

GETTING STARTED

Zhou Aihua was born in Shanghai in February 1969 into a family of workers. Through the influence of his father, a technician, Zhou Aihua has been interested in machinery since childhood. In 1990, with a passion for motor technology, he graduated from technical school and officially joined the third workshop of Shanghai Electric Machinery Co., Ltd. (now High-speed Motor Plant), and from then on he had a close relationship with motor assembly.

For more than 30 years, Zhou Aihua has been at the forefront of motor assembly, rapidly growing from a motor assembler to a leader in the field of motor assembly, innovatively exploring the debugging, static and dynamic balancing, general assembly and technical processing of ultra-high speed motors, distributed energy turbine generators and other motor products. He has overcome technical problems one after another with solid professional skills and unremitting innovative spirit.

"Each project is like my child, I have been a part of its birth and growth." From the research and development of high-speed permanent magnet motor to the assembly of 1E emergency diesel generator for nuclear power plant, from the production of the first set of localized motors for the West-to-East Gas Pipeline Project to the innovative ultra-high power density generator for marine use, Zhou Aihua has always been at the forefront, leading the team to overcome the difficulties and making excellent achievements in a number of important construction projects of the country and the Group, contributing to the successful development of new products and the smooth implementation of major scientific and technological projects.

Zhou Aihua still has fond memories of his early days at the plant. At that time, he was full of enthusiasm, curiosity and expectation. Nevertheless, facing the complex motor structure and assembly procedures, he felt unprecedented pressure. The intricate design drawings and pieces made him feel helpless. But instead of retreating, he chose to rise to the challenge. With



Careful instructions from master technicians and his own hard work, he gradually mastered the basic skills of motor assembly, gaining experience and constantly challenging himself.

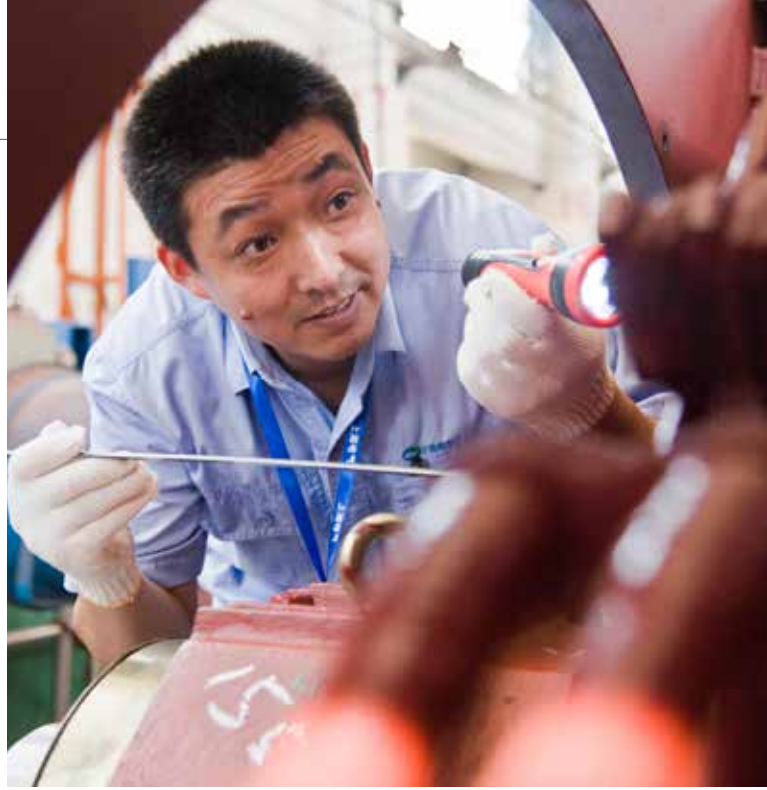
In order to improve his technical level, Zhou Aihua always maintains self-discipline and diligence. During the day he worked hard in the workshop, and at night he attended various study courses organized by the plant. He also obtained a number of technical qualification certificates to lay a solid foundation for his career.

OVERCOMING TECHNICAL PROBLEMS

There is always room for improvement in the field of motor manufacturing. Zhou Aihua has always remained humble, constantly acquiring new knowledge and pursuing the ultimate technology. He believes that only by constantly exploring and challenging himself can he continue on the path of technological innovation. This pursuit of excellence is the main reason he is able to make continuous breakthroughs in the field of motor assembly.

In the localization process of the first set of 20 MW ultra-high speed explosion-proof variable frequency synchronous motor for the West-to-East Gas Pipeline Project, once regarded as the "crown jewel" of the motor industry and monopolized by foreign giants for a long time, Zhou Aihua demonstrated excellent technical ability and developed a detailed assembly program to address the challenges of high gas tightness and extremely strict assembly requirements of the ultra-high speed synchronous motor. By improving the sealing materials and optimizing the assembly process, he ensured the stable operation of the motor. This achievement not only broke the technical monopoly of multinational companies, but also effectively reduced procurement costs, making an important contribution to national energy and economic development.

Zhou Aihua's persistent pursuit of technological innovation does not stop here. In the development of marine motors, he successfully overcame the installation and adjustment challenges of the generator shaft systems with solid technical skills. Through simulation of generator weight distribution ratio and other innovative means, he not only ensured the quality of the installation, but also effectively shortened the installation cycle. "We simulate the weight distribution of the generator and fine-tune every installation detail. Like the carving of a work of art, we are precise to every millimeter." It is with the pursuit of excellence that he finally overcame



the difficulties, laying a solid foundation for the technological progress of China's marine equipment.

However, behind these brilliant achievements are the countless attempts and failures of Zhou Aihua and his team, and every bit of progress is the result of their endless efforts and wisdom. Only Zhou Aihua himself deeply feels those unrecognized hardships and challenges. From the precise control of every tiny detail to the repeated tweaking of every program, it is a true reflection of his quest for technical perfection.

DEVELOPING EXCELLENT PRODUCTS

In motor manufacturing, vibration has always been a major problem plaguing product quality. Zhou Aihua led the team to thoroughly analyze the causes of vibration and implement a series of effective improvement measures, such as improving the alignment accuracy, optimizing the dynamic balance, adjusting the stator-rotor gap, etc., which successfully solved the vibration problem and increased the first delivery test pass rate from 30% to more than 90%. This remarkable result not only improves production efficiency, but also saves a lot of manufacturing costs for the enterprise and enhances the competitiveness of the product market.

"Our commitment to our customers and our own requirements is to provide products with not only good performance, but also excellent quality", Zhou Aihua said. In his opinion, quality is the lifeline of the enterprise and the key to winning the market. Therefore, in motor assembly, he always puts quality first, and carries out assembly and testing in strict accordance with technical standards and quality requirements. He is personally in charge of every detail

so that each product is in the best condition possible.

Nowadays, as a motor assembly expert, Zhou Aihua has deep achievements in product manufacturing, and is often invited by customers to help with product installation and troubleshooting. With outstanding professional skills and rich experience, he has successfully solved many problems encountered in the process of motor commissioning and operation, and won great praise from customers.

One time, a customer's motor was experiencing abnormal vibrations. This was seriously affecting the operation of the production line. Finally, the customer turned to Zhou Aihua. After receiving the call for help, Zhou Aihua immediately took his toolbox and drove to the customer's site. After careful inspection and testing, he found that the reason for the motor vibration was the dynamic imbalance due to improper bearing installation. After finding the root cause, he immediately started to repair it and solved the problem, and the production line resumed operation. The customer gratefully shook Zhou Aihua's hand and thanked him profusely. This visit not only deepened the trust and friendship between Zhou Aihua and the customer, but also made him more determined in his persistent pursuit of product quality. He knows that every detail is crucial to the quality of the product and the interests of the customer, so he always maintains a high level of responsibility and dedication, pouring his heart, soul and sweat into every product.

Under his leadership, the motor assembly team has gradually formed a rigorous, meticulous and excellence-oriented work style. They not only strive for excellence in product quality, but also achieve remarkable results in technological innovation and cost reduction. Zhou Aihua often encourages his team members, "We have to keep challenging ourselves, innovate, and make only high-quality products!" The entire team has dedicated itself to innovating and improving product quality with high morale. Together, they overcame numerous technical challenges to win more market share and customer trust for the company.



EDUCATION-INDUSTRY INTEGRATION

"The strength of the individual is not as strong as the strength of the team." As a senior motor assembly expert, Zhou Aihua, while tackling technical problems and improving quality, pays great attention to the cultivation and passing on of skilled talents, making outstanding contributions to the construction of high-skilled talents and technological progress in Shanghai Electric. He knows that only by training more excellent skilled talents can steady power be provided for the development of Shanghai Electric and even the industry. He often says, "As a master technician, I have a responsibility to pass on my experience and skills to young people so that they can grow up quickly and contribute to Shanghai Electric."

He has served as a practical training instructor for the specialty of motor manufacturing and has helped many skilled talents to realize the technological leap over the years. In the classroom, he patiently explains each knowledge point and operating skill, often analyzing and discussing them in combination with practical cases to help students better understand and master what they are learning. In addition to classroom teaching, Zhou Aihua also took on the task of master teaching. He taught by unreservedly sharing his experience and skills with the young people around him, helping them to quickly grow into the technical backbone of the company and management personnel. Through his hard work, a new group of young technical talents are shining in their respective positions and injecting new vitality into the company's development.

Zhou Aihua was awarded the special State Council allowance in 2023. Basking in this great honor, he stressed the necessity of "craftsmanship" and his understanding of "craftsmanship" is to love the profession you choose.

"Master Zhou not only taught me professional skills, but also, more importantly, he let me know what the spirit of craftsmanship is," A young apprentice said, "His spirit of striving for excellence and never being satisfied has always been an inspiration to me."

"We should dare to challenge ourselves and continue to push our limits," Zhou Aihua often encourages young people to be courageous and innovative. "Only by doing this can we be invincible in fierce competition." He compares himself to a motor, which never stops and injects new vitality and power into the development of the industry and the enterprise.

Under his mentorship, more and more young people have begun to devote themselves to the cause of motor assembly. They not only inherit Zhou Aihua's superb craftsmanship and professional dedication but also continuously innovate while striving to scale new heights. **D**

DIGITAL EMPOWERMENT AND INTELLIGENT LOW-CARBON SPACE

Shanghai Electric Digital Technology Co., Ltd. (hereinafter referred to as "SEDTE"), based on years of operation and management experience, has identified the pain points of enterprise space operation and maintenance, and initiated an innovative practice targeting at "digital and intelligent management of space operation", and developed "Fulian" intelligent space and communication solution (hereinafter referred to as "Fulian") for various types of spaces, which has effectively enhanced the digital and intelligent management capabilities of enterprises in terms of work collaboration, space energy conservation and digital transformation of operation.

The solution provides "one-step" convenient experience for users to enter different spaces such as parks, factories and buildings, enhances work collaboration between different scenarios, and comprehensively empowers enterprise operation and

maintenance of all kinds of digitized systems in the parks and buildings. It integrates easy configuration and long-term operation and maintenance into one platform, which is more convenient for collaboration and interoperability, functional application and data utilization among various modules.

As early as the initial stage of the system solution design, the "Fulian" system has planned an integrated, multi-module and scalable architecture from the bottom layer to adapt to the industrial and enterprise parks in multiple locations and various spaces. It can be used in the different scenarios of working space, such as access and visit, energy conservation, resource coordination, conferences and cultural communication. With organically linked visual experience and digital application, it realizes the flow of human behavior and the flow of information, which is then transformed into the flow of data and value in enterprise operation.

Through digital and intelligent means, the



"Fulian" system optimizes the energy-saving strategy of space operation and pays attention to the details of energy consumption, effectively improving the efficiency of resource utilization, reducing energy consumption and labor input, and promoting the sustainable development of enterprises.

In addition, with the concept of "Spatial Digital Twin", the "Fulian" system combines the real-time enterprise spatial operation data and control with three-dimensional visual interaction, spatial cloud communication and other innovative forms of digital display, which can be visualized by users, realizing a brand-new digital display effect and enhancing the communication of brand culture.

In order to perfect the "Fulian" system, SEDT has hired daily "experience officers" to provide continuous feedback on user experience, collect user opinions for program optimization and iteration, and create a "caring" digital system based on user needs. This has increased employee satisfaction through improved application efficiency and work environment experience.

The "Fulian" system has been awarded Platinum certification, the highest level of global recognition by WELL, for its proactive energy-saving strategy to promote green and low-carbon practices. In the future, SEDT will continue to explore, and with the enhanced capability of the "Fulian" system in enterprise management and governance, it will build a more energy-saving, environmentally friendly, comfortable and "human-oriented" green office and work environment. It will improve the enterprise operation and management capability and contribute to the achievement of the "dual carbon" goal. **D**



EXPANDING THE OVERHAUL SERVICE INDUSTRY CHAIN AND OPENING A NEW ERA FOR BEARINGS



With the rapid development of the rail transit axlebox bearing overhaul business, the traditional overhaul line has been unable to meet the increasingly high technical requirements and production demand.

Based on traditional bearing manufacturing business, Shanghai United Bearing Co., Ltd. (hereinafter referred to as "United Bearing") develops bearing overhaul business, forms a whole life cycle service industry chain of bearing manufacturing and overhaul, and improves the automation and intelligence of the overhaul line with high-tech automation equipment and digital management platform, which not only greatly improves energy efficiency, but also helps to reduce environmental pollution.

United Bearing has formulated the technical plan of the axlebox bearing overhaul production line renovation project (hereinafter referred to as the "technical renovation project") with a high starting point, high standards and high goals, and cooperated with a number of scientific and technological enterprises to promote the development of the domestic industrial chain through independent research, development and localization. The technical renovation project has designed and developed DCT-6000 fluorescent magnetic particle flaw detection equipment for inner and outer rings, ZCYBC2 bearing grease injection, weighing and grease homogenizing equipment, QG-26X/30B spin cleaning and centrifugal dryer and other advanced automated and intelligent testing equipment. It is also equipped with an axlebox bearing overhaul digital management platform. Through the implementation of the technical renovation project, United Bearing has transformed itself from a traditional manufacturer to a service-oriented manufacturer, promoted high-end manufacturing, intelligent, green and high-quality development, and further deepened the integration and development of advanced manufacturing and modern services. **D**



LOUDER THAN WORDS

By Sangao

Speech is silver but silence is golden. This saying has always been true. We should also remain silent when facing different views.

Our viewpoints reflect the experiences of our lives, and everyone has different insights and values. Of course, when we talk and interact with others, we will have different points of view. In a short period of time, the values of others gained through practice can hardly be changed, and there will never be a winning party in the debate, only the continuous thinking.

It is true that debates can sometimes be a source of clarification. But this is often not the case in reality. The purpose of our debates is mostly to change others' original views and make them homogeneous. We lose the further pursuit of reason, but only to fulfil our desire to win. Even if we achieve our goal of convincing others, we lose the benefit of thinking because of our one-sided reasoning.

We choose silence, not to avoid the fear of debate, as some people think, but to show the other side that we are listening and thinking, while avoiding pointless arguments. Zhuangzi's saying that good debaters do not talk much is a demonstration that there is infinite power in silence. By being calm and introspective, we are better able to clarify the logical framework of the

other side and ourselves, and to promote reasoning, which has a positive effect on further rebuttal or integration of different points of view.

In our own lives, we are like Truman in our own worlds. Thinking differently and listening in silence is a form of respect, and when we respect the views of others, we respect the world itself. The world itself is diverse and unpredictable. Modern society, which is inclined to homogenize, is obviously in a quandary. In an era of individualism, people are self-centered and have lost the ability to empathize with others and want to unify the views and positions of others. When being persuaded or persuading others, we should always be on our guard: The world should not be a place of uniform views, without the splendor of diversity.

There have been too many "angry" debates in this society, where people's emotions are vented through the expression of points of view. What we lack now is not the courage to debate. We need to calm down, silently reflecting on the positions and views of ourselves to show objectivity and strength.

Whether it is a person or a thing, silence has a unique beauty. The quietness and calmness that silence represents are more reliable and trustworthy. **D**



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