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COVER TOPICS

EXPLORING ZERO-CARBON INTELLIGENT MANUFACTURING WITH THE WORLD

Shanghai continuous internal data verification (K) no. 0465

2025.04 / 95

Bilingual bimonthly

A REVELATION AT THE CROSSROADS OF INDUSTRIAL CIVILIZATIONS

As the lights dim at the Hannover Exhibition Center, the digital imprint of Shanghai Electric continues to pulse across virtual realms. This grand showcase of innovation represents more than just technological advancement—it signals a fundamental shift in the global industrial landscape. No longer mere followers, Chinese enterprises now bring forth five millennia of cultural heritage and an innate drive for innovation, co-authoring the next chapter of industrial evolution with the world.

Behind this convergence of technology and culture lies Shanghai Electric's enduring commitment to openness and opportunity—backed by over three decades of experience in the global high-end equipment arena. Today, the company's international footprint spans 35 countries and regions, encompassing more than 130 overseas enterprises and branches. In expanding its global business presence, Shanghai Electric also deepens and broadens the influence of "Intelligent Manufacturing in China," meeting the tide of global industrial transformation with an open-minded attitude.

In Croatia, the turbines of the Senj Wind Farm continue to spin. This 156 MW project has not only reshaped the EU's perception of Chinese technology but also offered a beacon of green transformation to Central and Eastern Europe—delivering scalable, replicable solutions. Today, Shanghai Electric's orders are covering the full industrial value chain of the Belt and Road Initiative. From deploying photovoltaic arrays across vast deserts to constructing smart grids in the rainforests of Zambia, the company is harnessing the wisdom of Shanghai to help solve the pressing challenge of power scarcity across Africa.

As a rising digital screen at the exhibition's closing ceremony proclaimed: "When the wisdom of the Huangpu River flows into the Rhine, we are creating a parallel universe of the Third Industrial Revolution." In this realm of boundless possibility, Shanghai Electric wields advanced technology as its brush, and a community with a shared future for mankind as its canvas—painting a new era of green, intelligent manufacturing.

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2025. 04 NO. 56
Bilingual Bimonthly Journal

Shanghai Continuous Interior
Materials Printing Permit (K)
No.0465

Free Material Only for Internal Use

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Shanghai Electric

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At the Hannover Messe 2025, a spectacular industrial showcase kicked off. Signing transnational contracts worth RMB 3.637 billion, unveiling more than 20 cutting-edge technology products, and presenting an immersive metaverse exhibition booth, the Group left an imprint of Eastern innovation in the birthplace of industrial civilization.

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Think Independently

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Shanghai Electric and Academician Zhong Nanshan Explore New Models for Translating Research into Practice

Shanghai Electric recently held a strategic seminar with the National Center for Respiratory Medicine in Guangzhou, where the appointment ceremony for the Honorary Dean of the Shanghai Electric Institute of High-end Medical Technology* also took place. At the event, Zhong Nanshan, an Academician of Chinese Academy of Engineering—a renowned respiratory disease expert—engaged in in-depth discussions with Mr. Jia Tinggang, Vice President of Shanghai Electric, on topics including the localization of medical equipment and the transformation of scientific research into practical applications. Also, Shanghai Electric Medical Group* signed an honorary appointment agreement with Professor Zhong Weide—renowned urology expert and leading professor at Guangzhou First People's Hospital—naming him Honorary Dean of the Shanghai Electric Institute of High-end Medical Technology*. [D](#)

Shanghai Electric Named Among China's Top 50 Overseas Contracting Enterprises

The China Chamber of Commerce for Import and Export of Machinery and Electronic Products (CCCME) recently released its 2024 rankings for Chinese enterprises undertaking large-scale overseas turnkey engineering projects. With a total contract value of **USD 670 million**, Shanghai Electric ranked **32nd** on the list, which marked its seventh consecutive year of inclusion since the list's inception in 2018. In the category breakdown, Shanghai Electric secured: **21st** in total power project contract value; **10th** in thermal power projects; **18th** in power transmission and distribution projects; **35th** in new energy projects; **27th** in solar energy (photovoltaic) projects. [D](#)

Two More Shanghai Electric Subsidiaries Recognized as Municipal-Level Specialized and Sophisticated Enterprises

The Shanghai Municipal Commission of Economy and Informatization recently released the latest list of specialized and sophisticated SMEs. Among the newly selected are Shanghai Electric Thales SEC Transport Co., Ltd. and Shanghai Electric Smart City Information Technology Co., Ltd. With this addition, a total of **67** Shanghai Electric subsidiaries have now been honored with either the national-level "Little Giant" title or provincial/municipal-level specialized and sophisticated enterprise recognition. [D](#)





Siemens Switchgear Ltd., Shanghai* Named Among First "Excellence-Level Smart Factories" by MIIT

The Ministry of Industry and Information Technology (MIIT) recently announced the first batch of projects recognized as "Excellence-Level Smart Factories." Among the **235** selected was Siemens Switchgear Ltd., Shanghai*, a joint venture co-invested by Siemens and Shanghai Electric. Over the past **30** years, the company has earned a reputation as a major supplier of medium-voltage switch cabinets and circuit breakers in China's power transmission and distribution market—backed by its commitment to high-quality products and services. The company has previously received accolades including "Shanghai Smart Factory," "National Green Factory Demonstration," and "Shanghai Zero-Carbon Model Factory." **D**

Successful Delivery of Sumbagsel-1 Pithead Coal-fired Project in Indonesia

Shanghai Electric has participated in the construction of the Sumbagsel-1 **2×150 MW** Pithead Coal-fired Power Plant project in Indonesia, marking a significant milestone. The project has successfully passed the NDC (Net Dependable Capacity and Reliability Operation, including **168** full-load hours) test, meeting the conditions for commercial operation and handover to the owner. This project involves the construction of two **150 MW** circulating fluidized bed coal-fired thermal power units. Upon completion, it will effectively address the local challenges of coal transportation, providing a strong guarantee for power supply in South Sumatra, Indonesia, while promoting local employment and economic development. **D**





Uzbekistan's First Digital Substation Completed by Shanghai Electric

Shanghai Electric has successfully completed the construction of the Zafarabad 220kV Digital Substation in Jizzakh Region, Uzbekistan—the nation's first-ever digital substation. As a milestone project in technical advancement, it stands as a key achievement of China-Uzbekistan cooperation under the Belt and Road Initiative. At the heart of the project are two **250 MVA** autotransformers independently developed and manufactured by Shanghai Electric. Once operational, the substation will provide an additional **400 MW** of power to the region, significantly enhancing the reliability of electricity supply in eastern Uzbekistan. The project not only strengthens the local energy infrastructure but also ensures stable and dependable power for both residents and enterprises. **D**

Shanghai Electric Wind Power Wins Bids for Onshore Wind Power Projects

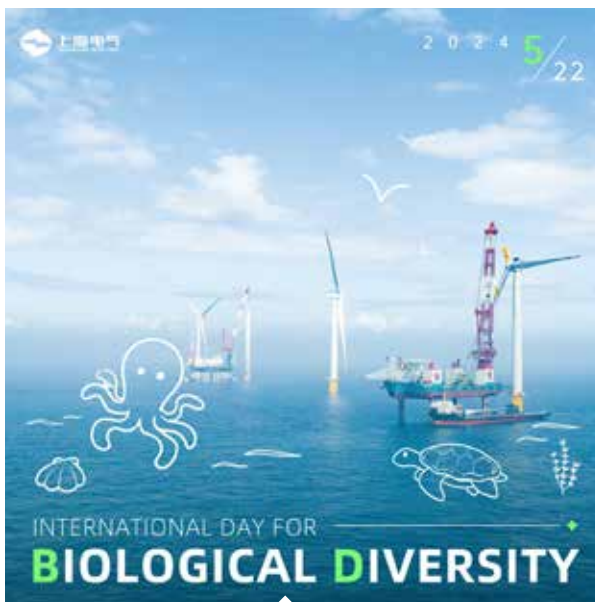
Shanghai Electric Wind Power Group Co., Ltd. has recently secured several bids for key onshore wind power projects. These include the **100 MW** CGN New Energy's Chongqing Youyang Jiagai and **50 MW** Guganshan onshore wind power projects, as well as Shenergy's **100 MW** wind power project in Dacheng, Hebei. These projects will benefit from Shanghai Electric's onshore Zhuoyue Platform turbines and services. Since the launch of this platform, the company's turbines have been deployed across various regions with diverse wind speeds, including Guizhou, Chongqing, Shanxi, Inner Mongolia, Jilin, Hebei, Henan, and Hunan. Furthermore, Shanghai Electric Wind Power Group Co., Ltd. has successfully won its first bid in the Guangxi market, securing the **50 MW** Feishiling and Baibao wind farm projects from Guangxi Beitou Energy Investment Group Co., Ltd. **D**

Anhui's First Million-Class Double Reheat Unit Enters Commercial Operation

On March 30, Anhui Qianyingzi Power Generation Co., Ltd. successfully completed the 168-hour trial run of its Phase II expansion project—a **1,000 MW** ultra-supercritical double reheat coal-fired power generation unit—marking the official commissioning of Anhui's first million-class double reheat unit. The project was supplied with a complete set of main equipment, including boiler, turbine, and generator auxiliaries, by Shanghai Electric Power Generation Group. As a key power source project in Anhui Province's 14th Five-Year Power Development Plan, the project adopts internationally advanced double reheat technology. Emission levels are significantly below national limits, with environmental performance reaching leading industry standards. **D**

Shanghai Electric Power Generation Group Wins Bid for Huaihe Energy's Gas Power Project in Wuhu

Shanghai Electric Power Generation Group has recently won the bid for the Wuhu Natural Gas Peaking Power Plant Project by Huaihe Energy (Group) Co., Ltd., providing two sets of large F-class gas turbine island units along with long-term maintenance services. Located in the Sanshan Economic Development Zone of Wuhu, this project is a key energy initiative for Anhui Province. Upon completion, the plant will deliver an annual power output of **2.40359 billion kWh**, significantly enhancing the province's grid peaking capacity and improving the overall energy efficiency of the region. **D**



Shanghai Electric's Overseas Communication Case Wins Silver Dove Award

The 2024 Shanghai Silver Dove Award results have been announced. Shanghai Electric's overseas communication case, "Building the Beauty of Biodiversity" poster series, stood out among **751** entries, winning the International Communication Product Design Excellence Award. This recognition underscores Shanghai Electric's commitment to its green, low-carbon, and environmentally friendly sustainable development brand philosophy. **D**

Shanghai Electric Wins Bid for All-Vanadium Redox Flow Energy Storage Demonstration Project

Shanghai Electric Energy Storage Technology Co., Ltd. has won the bid for a **250 kW/1 MWh** all-vanadium redox flow energy storage demonstration project by Hefei University of Technology. This project represents an important demonstration of energy storage at the user side in Hefei parks and marks a key step in Shanghai Electric's deepening presence in the Anhui province's new energy storage market. The project will feature a fully modular all-vanadium redox flow system, serving as a demonstration for distributed energy grid connection and providing significant reference for large-scale domestic and international distributed energy storage grid connection projects. **D**



Hency Solar Secures 600 MW Photovoltaic Module Order

Hency Solar Technology Co., Ltd. has signed a **600 MW** photovoltaic module framework procurement agreement with Electric Power Technology Co., Ltd. of Jiangsu Pengzhi. The project adopts the Pioneer **2.0 Series 'SEP3-132D-620YS'** high-efficiency N-type photovoltaic modules, which will be deployed in distributed PV projects at JD Logistics Parks, as well as centralized PV projects in Nanjing, Xuzhou, Suqian, and Lianyungang. These are all premium application scenarios with strong grid connectivity and power absorption capabilities. **D**





RMB 3.637 Billion in Cross-Border Strategic Cooperation Signed

Shanghai Electric Showcases High-End Equipment Capabilities on the Global Stage

The world-renowned Hannover Messe was held from March 31 to April 4, where Shanghai Electric made its debut in the "Smart Manufacturing" exhibition area, representing China's high-end equipment manufacturing sector. With the theme "INNOVATION IGNITING THE WORLD", the company showcased its latest innovations in green low-carbon energy transition and AI-powered smart manufacturing.

During the expo, Hua Yuan, Member of the Standing Committee of the CPC Shanghai Municipal Committee and Vice Mayor, led a government delegation to the Shanghai Electric exhibition area and witnessed the signing of RMB 3.637 billion in strategic cooperation agreements. Vice President Jia Tinggang of Shanghai Electric accompanied the delegation.

The signed projects span over ten countries, including Germany, the United Kingdom, France, Egypt, and Zambia, focusing on three core areas: green and low-carbon development, smart infrastructure, and high-end manufacturing. The initiatives will drive advancements in wind power, photovoltaics, energy storage, aerospace manufacturing, and industrial basic parts, showcasing Shanghai Electric's "going global and bringing in" strategy. By fostering international technological collaboration and building shared industrial ecosystems, Shanghai Electric contributes Chinese solutions to global industrial transformation.



GREEN AND LOW-CARBON INNOVATIONS ON FULL DISPLAY

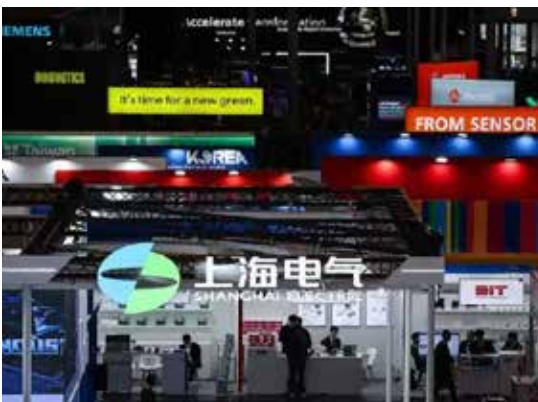
At this year's exhibition, Shanghai Electric unveiled over 20 groundbreaking innovations, spanning automation solutions for the aerospace industry, new energy vehicle applications, and integrated zero-carbon industrial park systems. The company also launched three major new products, underscoring the deep integration of high-end equipment with intelligent energy solutions. Among the highlights was the "Thinker" Series Smart Photovoltaic Module, which features an advanced intelligent control module to significantly enhance power generation efficiency through real-time optimization. Also showcased was a new-generation hydrogen I-type groove system (1,000 Nm³ level), developed in-house using high-performance composite membrane technology. It offers high hydrogen output, energy efficiency, and simplified operation and maintenance. In addition, the company introduced a 50 Nm³/h seawater/wastewater electrolysis hydrogen production system, featuring an innovative technology for direct coupling with various water sources. This system ensures high efficiency and durability across a range of water qualities, with all core indicators ranking among the best in China.

DIGITAL EMPOWERMENT BRINGS THE STORY OF "INTELLIGENT MANUFACTURING IN CHINA" TO LIFE

At the heart of the exhibition area, a dynamic mobile industrial robot named "SNOWFLAKE" illustrated the flexible manufacturing paradigm of future aerospace production. An AI-driven energy optimization system served as a model for smart industrial park applications, while a glasses-free 3D screen brought to life Shanghai Electric's global layout across six major sectors: marine, land, air, wind, solar, and hydrogen, using a digital character matrix. At this global stage for industrial innovation, Shanghai Electric is painting the future of intelligent manufacturing with technology as its brush and low carbon as its palette, seamlessly blending the virtual and the real to chart a new vision for the full industrial value chain.

Behind this convergence of technology and culture lies Shanghai Electric's enduring commitment to openness and opportunity—backed by over three decades of experience in the global high-end equipment arena.

Today, the company's international footprint spans 35 countries and regions, encompassing more than 130 overseas enterprises and branches. In expanding its global business presence, Shanghai Electric also deepens and broadens the influence of "Intelligent Manufacturing in China," meeting the tide of global industrial transformation with an open attitude. **D**



New Chapter in China-Arab Green Energy Cooperation!



Shanghai Electric Signs Comprehensive Wind Power Agreement with Oman

On April 13 local time, witnessed by Oman's Minister of Energy and Minerals Salim bin Nasser bin Said Al Aufi, Minister of Finance Sultan bin Salim bin Said al-Habsi, Chairman of the Public Authority for Special Economic Zones and Free Zones Dr. Ali bin Masoud Al Sunaidy, Minister of Commerce, Industry & Investment Promotion Qais bin Mohammed Al Yousef, and Secretary of the Party Committee and Chairman of Shanghai Electric Group Wu Lei, Shanghai Electric signed a comprehensive cooperation package with Oman's Mawarid Group. The agreements include a wind power supply framework contract, technology licensing, and localized factory design.

Minister Salim highly praised Shanghai Electric's technical strength and innovation in wind power, stating that the Oman government attaches great importance to its partnership with Shanghai Electric. Taking the signing of this wind power project as an opportunity, he expressed strong anticipation for further cooperation in energy storage, hydrogen energy, and photovoltaics, aiming to accelerate Oman's energy transition.

Mr. Wu Lei expressed heartfelt gratitude to the Oman government and Mawarid Group for their trust. In his speech, he noted that Shanghai Electric adheres to the philosophy of "openness, coordination and

win-win cooperation," aiming to drive global energy transformation through innovation and international partnerships. Oman's forward-looking Vision 2040 and green hydrogen strategy align perfectly with Shanghai Electric's strategic development goals. He added that this project will serve as a starting point for integrating Shanghai Electric's advanced technologies and high-quality products in new energy with Oman's abundant resources and market potential. Through innovation in technology licensing and localized supply chain development, both sides will facilitate the implementation of more premium projects, inject strong impetus into Oman's energy transition, and jointly write a new chapter in China-Arab energy collaboration.

Prior to the signing, Wu Lei also held separate talks with Minister Salim and Mansour bin Talib Al Hinai, Chairman of the Authority for Public Services Regulation, to exchange views on deepening future cooperation.

The signing ceremony was attended by over 100 distinguished guests, including officials from the central government of Oman, Chairman of Oman's Sovereign Wealth Fund, Chairman of Nama Holding, the Chairman of Oman Oil, Jin Xiaolong, Member of the CPC Committee and Vice President of Shanghai Electric, and Mustafa, CEO of Mawarid Group. **D**

Shanghai Electric and MASDAR Sign 2GW Solar PV Project Agreement

On April 10 local time, under the witness of Wu Lei, Secretary of the Party Committee and Chairman of Shanghai Electric Group, and Mohamed Jameel Al Ramahi, CEO of Abu Dhabi Future Energy Company (MASDAR), Shanghai Electric signed a cooperation agreement with MASDAR for the 2GW Al Sadawi solar project.

This project is part of the fifth round of Saudi Arabia's National Renewable Energy Program (NREP) and represents Shanghai Electric's largest photovoltaic EPC contract to date. Located in eastern Saudi Arabia and covering approximately 40 square kilometers—equivalent to 5,700 standard football fields, the project is expected to deliver over 6 billion kilowatt-hours of electricity annually, meeting the needs of more than 700,000 households and reducing carbon emissions by 3 million tons per year. This will play a crucial role in upgrading Saudi Arabia's energy structure and achieving its "Vision 2030" goals.

In his speech, Wu Lei highlighted that MASDAR is one of the most influential clean energy developers in the Middle East and globally. The signing of the

Al Sadawi solar project reflects the deep trust and complementary strengths between the two parties in green energy transition. This agreement marks a new beginning for comprehensive cooperation between Shanghai Electric and MASDAR, and a significant milestone for Shanghai Electric's further expansion into the Middle Eastern new energy market. Wu expressed hope that both sides will work closely to create a model benchmark project and jointly contribute to the global energy transition.

MASDAR CEO Al Ramahi highly praised Shanghai Electric's contract performance and innovation in the fields of new energy such as photovoltaics and wind power. He stated that MASDAR values its partnership with Shanghai Electric and looks forward to deepening collaboration in wind, solar, and energy storage to jointly advance global energy transformation.

The signing ceremony was also attended by Jin Xiaolong, Member of the CPC Committee and Vice President of Shanghai Electric, Abdullah Zayed, Director of Business and Project Development at MASDAR, and other representatives from both companies. **D**



Shanghai Electric and SPPC Discuss New Opportunities for Green Energy Cooperation

On April 16 local time, Wu Lei, Secretary of the Party Committee and Chairman of Shanghai Electric Group, visited the Saudi Power Procurement Company (SPPC) and held in-depth discussions with SPPC CEO Mr. Mazin Albahkali on the Saudi energy market, the progress of key collaborative projects, and future cooperation directions.

Wu Lei thanked SPPC for its continued

trust and support. He emphasized that Saudi Arabia is one of Shanghai Electric's most important strategic markets in the Middle East, and the company places great importance on its partnership with SPPC. In recent years, Shanghai Electric has been actively practicing a green development philosophy and leveraging its comprehensive strengths in clean energy, intelligent manufacturing, and industrial systems solutions. Wu expressed hope that the two sides will deepen strategic cooperation in photovoltaics, wind power, hydrogen energy, and energy storage, contributing to the optimization of Saudi Arabia's energy structure and the realization of its "Vision 2030" sustainability goals. He also conveyed Shanghai Electric's willingness to strengthen technical collaboration with SPPC and explore joint innovations in developing new power systems, providing high-quality solutions to support Saudi Arabia's energy transformation.

Mr. Albahkali highly praised Shanghai Electric's active presence and professional capabilities in the Saudi market and congratulated the company on successfully winning the 2GW Al Sadawi solar project. He reaffirmed SPPC's strong commitment to working with Chinese enterprises and welcomed Shanghai Electric's continued participation in upcoming renewable energy projects, including photovoltaics, wind power, energy storage, and green hydrogen-methanol initiatives. He also expressed interest in expanding cooperation in local manufacturing and technology exchange to jointly advance the high-quality development of clean energy in Saudi Arabia. **D**



Shanghai Electric's Green Methanol Project Reaches Final Sprint

On February 14, 2025, a mobilization rally was held at the site of Shanghai Electric's wind power-biomass green methanol integrated demonstration project in Taonan, Jilin (hereinafter referred to as the "Taonan Green Methanol Project"). During the event, a special task force was established, and key representatives from participating entities signed target responsibility agreements, collectively committing to achieving "zero accidents, zero defects, and zero delays" as they launched the final push toward project completion.

The Taonan Green Methanol Project is part of Shanghai Electric's green energy initiatives and China's national energy transformation strategy. It helps the country meet its "dual carbon" goals while contributing to Shanghai's ambition of becoming a global center for finance, trade, innovation, shipping, and economy. Utilizing wind power-generated hydrogen integrated with biomass-based green methanol production technology, the project's core technologies and critical equipment were independently developed and manufactured by Shanghai Electric. It has successfully tackled technical challenges such as large-scale biomass gasification and the integration of fluctuating green electricity with stable chemical production. Additionally, it has obtained full-process ISCC EU certification, laying a solid foundation for the commercialization of green methanol. From raw material collection and storage to the final product, the project enables full life-cycle carbon emissions traceability, with technical benchmarks reaching internationally advanced levels. This initiative provides a scalable and

replicable "Shanghai Electric Solution" for China's green fuel industry.

As China's first large-scale green methanol demonstration project, the Taonan Green Methanol Project has garnered widespread public and media attention since its official commencement in March 2024. Recently, CCTV and SMG, two of China's leading media outlets, have featured updates on the project.

On February 10, CCTV's special segment "New Year, New Outlook, New Endeavor" highlighted how Jilin Province is strengthening the supply chain collaboration across the new energy, expanding application scenarios, upgrading energy consumption structures, and promoting high-quality development in the new energy sector through the Taonan Green Methanol Project.

On February 11, SMG reported on the project's construction progress during the Chinese New Year holiday, as well as future production and supply plans for green methanol.

Over the past 10 months, the project team and all participating units have overcome the dual challenges of extreme cold weather and the complexity of demonstration project technology, transforming a vast snowy landscape into a high-tech industrial site. By continuously working through winter and forgoing holiday breaks, they have made remarkable progress through collaborative efforts. Looking ahead, Shanghai Electric remains committed to an innovation-driven development strategy, positioning the Taonan Green Methanol Project as a benchmark for high-quality development in China's new energy industry, further paving the way for green transformation. 

First Move in Green Certificate Trading! Shanghai Electric Issues First Batch of Green Certificates and Signs Inaugural Trading Contract

Shanghai Electric has signed its first green certificate (GC) trading contract, marking a significant breakthrough in its new energy certificate business and reaffirming its position as a global leader in integrated sustainable development solutions.



A "green certificate", also known as a green power certificate, is an official document issued by China's National Energy Administration, serving as the sole proof of the environmental attributes of renewable energy electricity in China. Each certificate corresponds to 1,000 kWh (1 MW) of renewable power and carries a unique identifier. It verifies that both the power generator and consumer have produced and used green electricity, essentially acting as the "ID card" of green power. As such, green certificates not only represent the environmental value of renewable energy but also serve as crucial instruments in achieving China's "dual carbon" goals of peaking carbon emissions and reaching carbon neutrality.

The certified project is Shanghai Electric New Energy Development Co., Ltd.'s first wind power initiative in Gongzhuling, Jilin Province (Gongzhuling Wind Power Rural Revitalization Project). The project has a planned total capacity of 40.2 MW, deploying three turbines with a single-unit capacity of 6.25 MW and another three turbines with a single-unit capacity of 7.15 MW. Since being connected to the grid in December 2023, the project has operated stably and delivered highly efficient green power output.

With this milestone, Shanghai Electric is poised to further embrace green development, actively exploring new technologies and business models in the renewable energy space. The company aims to provide comprehensive green energy solutions, including both green electricity and certificates, to help clients transition to sustainability and build low-carbon supply chains, staying true to its commitment to a greener future. **D**



Main Equipment for Unit 8 of Tianwan Nuclear Power Project Successfully Shipped

Recently, the generator stator and low-pressure turbine modules, the key conventional island components for Unit 8 of the major Tianwan Nuclear Power Project, were successfully shipped from Shanghai Electric's Lingang Heavy Equipment Terminal. Notably, the core equipment of this nuclear power unit embodies multiple proprietary technological innovations by Shanghai Electric, all of which have been filed for national patents. Among them, the welding technology for the low-pressure rotor has undergone extensive operational validation, demonstrating stable quality and proven technology. It has now reached a leading level domestically and lays a solid foundation for the manufacturing of advanced large-scale nuclear power low-pressure rotors. **D**



Shanghai Electric Ranks First in Key Generator Unit Reliability Metrics

On March 24, the National Energy Administration held its annual Power Reliability Indicators Conference in Beijing. The 2024 power reliability data released at the event confirmed that Shanghai Electric continues to lead the industry across multiple generator classes in terms of annual equivalent unplanned outage hours and number of award-winning units. According to the data, Shanghai Electric's generator units of 100,000 kW and above recorded an average of only 2.93 hours/unit/year of equivalent unplanned outages, once again securing the top spot among peers. This reliability indicator continues to remain optimal. Specifically, the 1,000 MW-class units posted an impressive figure of just 0.04 hours/unit/year, with a 0-point impact on equivalent availability factor, ranking first in the industry. Units in the 600 MW and 300 MW categories also held the top positions. Shanghai Electric also received honors for 25 generator units, accounting for nearly 50% of all recognized units. Among the 10 awarded 1,000 MW-class units, Shanghai Electric contributed more than 83%, with five of them fully equipped with Shanghai Electric's main equipment. **D**



Shanghai Electric's Smart Elevator Solutions Empower the Construction of the “Tallest Building in Puxi”





On March 17, a contract signing ceremony was held for the elevator engineering of the North Bund 91 Block Project. The signing was witnessed by key investors, including Shanghai Industrial Investment (Holdings) Co., Ltd., Shanghai Chengtou Group Corporation, and Shanghai Construction Group, as well as Shanghai Mitsubishi Elevator's major stakeholders—Shanghai Electric Group and Mitsubishi Electric Corporation.

The North Bund 91 Block Project, located in the heart of Shanghai's North Bund, will feature a 480-meter-tall skyscraper with a total floor area of approximately 450,000 square meters, slated for completion by 2030. Once finished, it will reshape Shanghai's skyline, becoming Puxi's tallest landmark.

The project will incorporate Shanghai Mitsubishi Elevator's "LNK Smart Elevator Digital Solution", with 107 elevators and 30 escalators, including 9m/s high-speed double-deck elevators and 8m/s high-speed, 4,000kg ultra-large-capacity elevators, designed to meet the complex transport demands of super high-rise buildings.

To ensure long-term operational efficiency, the project has pioneered an industry-first "10-year warranty" service framework. Shanghai Mitsubishi Elevator will establish a dedicated ultra-high-rise project team to oversee installation, delivery, and maintenance, maximizing user value throughout the entire lifecycle.

The contract signing was attended by prominent industry figures, including Leng Weiqing, Chairman of Shanghai Industrial Investment (Holdings) Co. Ltd., Hang Yingwei, Chairman of Shanghai Construction Group, Ye Yuanxin, Chief Engineer of Shanghai Chengtou Group Corporation, Kei Uruma, President of Mitsubishi Electric Corporation, Dong Jianhua, Executive Vice President of Shanghai Electric Group, Jin Xiaolong, Vice President of Shanghai Electric Group, Huang Haiping, Vice President of Shanghai Industrial Investment (Holdings) Co. Ltd., Xue Yongshen, Vice President and Chief Economist of Shanghai Construction Group. **D**



"WIND-SOLAR-STORAGE-HYDROGEN"
MULTI-ENERGY SYSTEMS

TRANSPORTATION
MARINE

AEROSPACE

PETROCHEMICAL

INDUSTRIAL

ENERGY SOLUTIONS

"GENERATION-GRID-LOAD-STORAGE"
ECOSYSTEMS

EXPLORING ZERO-CARBON INTELLIGENT MANUFACTURING WITH THE WORLD

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t the Hannover Messe 2025, a spectacular industrial showcase kicked off. Signing transnational contracts worth RMB 3.637 billion, unveiling more than 20 cutting-edge technology products, and presenting an immersive metaverse exhibition booth, the Group left an imprint of Eastern innovation in the birthplace of industrial civilization.

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SHANGHAI ELECTRIC SHOWCASES A NEW INTELLIGENT ERA OF GREEN INDUSTRY AT HANNOVER MESSE

Hannover Messe, the world's most influential event in the industrial sector, was held from March 31 to April 4, 2025. Representing China's high-end equipment manufacturing industry, Shanghai Electric made its debut in the Smart Manufacturing exhibition area at Hannover Messe. With the theme "INNOVATION IGNITING THE WORLD", the Group showcased its achievements in green, low-carbon energy transformation and AI-powered smart manufacturing. During the event, Mr. Hua Yuan, Shanghai Municipal Party Standing Committee Member and Shanghai Vice Mayor, led a government delegation to visit the Shanghai Electric booth and witnessed the signing of strategic cooperation agreements totaling RMB 3.637 billion.

The signed projects span over ten countries, including Germany, the UK, France, Egypt, and Zambia, focusing on three core themes: green and low-carbon development, smart infrastructure, and high-end manufacturing. These agreements aim to implement key technologies in wind power, photovoltaics, energy storage, aerospace manufacturing, and fundamental industrial components. Through cross-border technological collaboration and co-construction and sharing of the industrial ecosystem, Shanghai Electric presents a Shanghai solution that deeply integrates both "going global" and "bringing in," contributing Chinese wisdom to global industrial transformation.

Shanghai Electric brought over 20

breakthrough products to the exhibition, including automation solutions for the aviation industry, new energy vehicles, and zero-carbon industrial parks. It also unveiled three new flagship products during the event, highlighting innovations from the deep integration of advanced equipment and smart energy. The "Thinker" Smart PV Modules are equipped with cutting-edge intelligent control modules, significantly enhancing power generation efficiency through real-time optimization. The Next-Generation Hydrogen Cubic-Level Type-I Electrolyzer features high-performance composite membrane technology developed in-house, enabling high hydrogen output, energy efficiency, and ease of maintenance. The 50Nm³/h Seawater/Wastewater-to-Hydrogen System is a pioneering system that directly electrolyzes seawater or wastewater for hydrogen production. It offers high efficiency and strong adaptability to different water qualities, reaching a leading domestic level in various performance metrics.

At the center of the booth, the "Snowflake" Mobile Industrial Robot Platform showcases a flexible production model for future aerospace manufacturing. AI-driven energy optimization systems create a benchmark for intelligent industrial parks. A naked-eye 3D display vividly illustrates the company's global layout across six major industries: marine, land, air, solar, wind, and hydrogen. At this global stage for industrial innovation, Shanghai Electric paints a futuristic picture of intelligent manufacturing across the entire industrial chain, blending technology with sustainability.



DECODING THE NEW PARADIGM OF "INTELLIGENT MANUFACTURING IN CHINA": A SPECTACLE OF THE VIRTUAL AND THE REAL

Step into Shanghai Electric's exhibition space, and it feels like walking into a cyberpunk version of a movable-type printing workshop. Traditional Chinese typography, as an intangible cultural heritage, is deconstructed into floating digital modules, suspended and recomposed mid-air. Industrial robots, transformed into "metal craftsmen," perform modernized movable-type printing with millimeter-level precision. Behind this fusion of the virtual and the real lies Shanghai Electric's deep interpretation of smart manufacturing: "a blend of starry-eyed innovation and grounded craftsmanship."

At this exhibition, Broetje Automation, a Shanghai Electric subsidiary, presented its Line-less Mobile Assembly System (LMAS) as the centerpiece, jointly launching an innovative mobile industrial robot platform called the "Snowflake System." This platform redefined flexible manufacturing in the aerospace industry and was designed to tackle the labor shortage. The "Snowflake" flexible manufacturing system quickly became a crowd favorite, merging and dispersing like a flock of migrating starlings, captivating and dynamic.

As a global leader in complex, large-scale automated assembly systems, Shanghai Electric is enabling the aerospace industry's upgrade through intelligent, high-precision core equipment. Its solutions cover aircraft structural assembly, subsystem integration, and critical parts manufacturing, offering full-chain support from automated assembly to flexible logistics.

Additionally, backed by more than a decade of technical know-how and delivery experience, Shanghai Electric has built full-lifecycle automated production line solutions for the new energy lithium battery industry, covering the entire process from cell production to module/pack assembly. In the new energy vehicle (NEV) sector, Shanghai Electric delivers comprehensive industry solutions encompassing low-carbon industrial facility design, automated production lines, and thermal management components, driving the transition to low-carbon mobility. Leveraging its integrated strengths in technology, product innovation,

system integration, and service capabilities, it empowers the global NEV industry's sustainable transformation.

Through its modular architecture and end-to-end quality control systems, Shanghai Electric helps customers upgrade to green, low-carbon intelligent manufacturing. It ensures the safety, energy density, and long cycle life of NEV power batteries, driving the industry toward greater efficiency, intelligence, and sustainability.

Highly Group, another Shanghai Electric subsidiary, showcased a new energy vehicle air-conditioning compressor solution, featuring wide-range operational capability and high reliability. With lightweight and compact structural design, it balances safety and integration needs in thermal management systems, providing efficient, durable AC compressors that can adapt to all-domain scenarios. Key features include high safety, intelligent control, and low carbon footprint.

experiencing the "Snowflake" system. He noted that traditional flexible manufacturing systems cost millions of euros, but Shanghai Electric's modular solution slashed that by more than half—an impressive feat. The new paradigm of "Intelligent Manufacturing in China" breaks through the limitations of traditional industry, reshaping the cognition and practices of scholars and practitioners.



TECHNOLOGICAL BREAKTHROUGH TRILOGY: A HARMONY BETWEEN INDUSTRIAL CIVILIZATION AND ECOLOGICAL SUSTAINABILITY

If the exhibition space was a cultural showcase, then the tech launch was a true display of cutting-edge industrial strength. Shanghai Electric unveiled three core innovations that took the global stage by storm:

THE “PHOTOSYNTHESIS” REVOLUTION OF SOLAR PANELS

At the Hannover Messe 2025, Shanghai Electric showcases its two flagship Hency Solar products: the Creator 210R Series Modules, based on high-efficiency heterojunction technology, and the Pioneer 210R Series Modules, utilizing advanced TOPCon technology. The Creator Series achieves up to 90% bifaciality factor, with a maximum output power of 650 W, significantly enhancing system energy yield. Through technological optimization, the “Pioneer” series balances power output and reliability, expanding adaptability for both large-scale ground power stations and distributed solar applications.

Both product lines extend the cost-performance advantages of the 210 mm silicon wafer platform, delivering lower Levelized Cost of Energy (LCOE) through enhanced power output and optimized system economics. The Creator Series Heterojunction (HJT) Module is Shanghai Electric's flagship photovoltaic product, utilizing 210R golden-size solar cells with global market validation. These next-gen monocrystalline modules feature high efficiency, exceptional bifaciality, and low temperature coefficient. Breakthroughs in wafer architecture and cell processing overcome traditional efficiency limits, enabling superior weak-light performance. When paired with AI solar trackers that dynamically follow sun paths, they achieve higher yields. The Pioneer series excels in thermal stability, reliability and LID. With mature mass production and lower costs, it's ideal for utility-scale plants and C&I applications.

Shanghai Electric's Heterojunction Modules, described as “solar panels that breathe”, deliver 90% bifacial power yield—converting harsh Southeast Asian sunlight into a power-generating advantage and harnessing reflected light to boost output. The impressive 650 W peak capacity is equivalent to condensing the power of six microwave ovens onto a two-square-meter glass panel.





HYDROGEN POWER'S GREEN PUZZLE CUBE

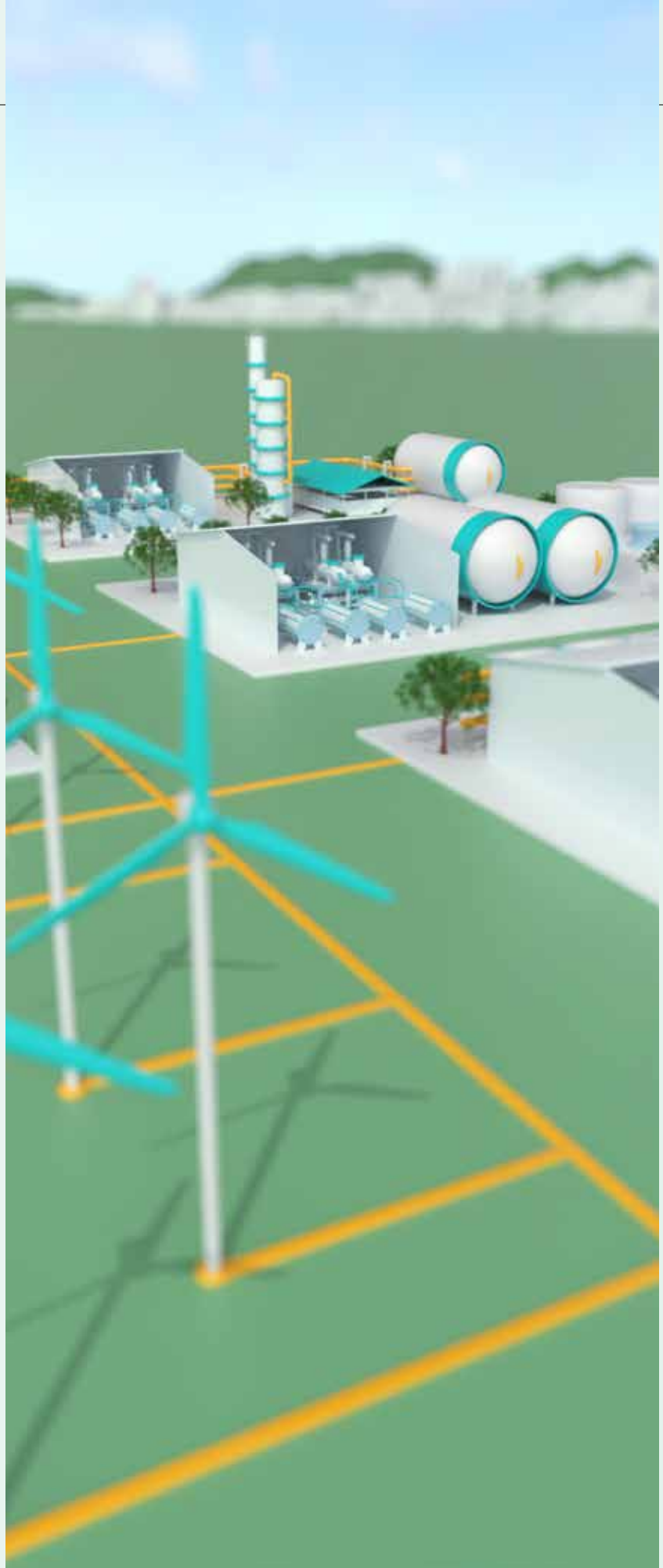
Green development is the defining hallmark of high-quality growth, and green hydrogen serves as the linchpin of carbon neutrality transitions. Shanghai Electric delivers integrated "Production-Storage-Refueling-Application" hydrogen solutions, featuring high-capacity alkaline electrolyzers for centralized, continuous hydrogen production, high-efficiency PEM electrolyzers for distributed, flexible scenarios, "N-to-1" system designs enabling multi-stack coordination. Its technological breakthroughs power diverse applications, including green chemical synthesis, hydrogen-based metallurgy, hydrogen-powered transportation and hydrogen energy storage. With an annual production capacity of 1 GW for alkaline electrolyzers and 200 MW for proton exchange membrane (PEM) electrolyzers, Shanghai Electric is well-positioned to help customers build a new green, low-carbon energy ecosystem, supporting global clients in achieving their carbon neutrality goals.

While others still struggle with electrolysis efficiency, Shanghai Electric's "Poseidon" hydrogen system has already achieved direct seawater electrolysis. At its Chongming Island demonstration site, the hydrogen byproduct water is used to oxygenate aquaculture farms. "We're experimenting with turning electrolyzers into underwater ecological spheres," revealed a project lead. "In the future, offshore wind-hydrogen hubs might become artificial fish reefs."

"SPEED AND POWER": THE ULTRA-HIGH-SPEED MOTOR

Shanghai Electric's 80 MW ultra-high-speed explosion-proof synchronous motor is a marvel of sustainable engineering, combining efficiency, reliability, and precision.

Nicknamed the "Flash" of the industrial world, this motor maintains stability even at 6,000 RPM. At the Long San Microgrid



Project in Malaysia, it pushes renewable energy penetration rates up to 97%. "It's like watching a football-field-sized energy storage system dance on a strand of hair," an engineer remarked, marveling at the control precision achieved.

As China accelerates its strategy of "new industrialization" and cultivating new quality productive forces, the integration of AI algorithms and real-world applications has become an inevitable trend in the energy equipment sector. The integration will feature highly automated and flexible production systems, deep vertical integration of supply chains, and widespread application of data analysis and AI in decision-making, quality control, and predictive maintenance.

Leveraging AI algorithms and IoT, Shanghai Electric has built a Virtual Power Plant (VPP) operation and management platform, integrating distributed power sources, storage facilities, and adjustable loads. This platform enables real-time energy dispatch, power market participation, demand response, and grid auxiliary

services, helping address the intermittent challenges of power supply and achieve energy balance across generation, grid, load, and storage, and propelling the digital transformation of the industrial sector.

To date, the company has implemented smart energy projects globally, including Malaysia's Long San Solar-Diesel-Storage Microgrid, Shanghai's Chongming Island Sanxing Town Demonstration Project, Pudong's Lianmin Village Smart Microgrid, and the Shantou Smart Energy Demonstration Project in Guangdong. These projects combine microgrids, energy storage, and renewables to provide green, efficient, and reliable power solutions, accelerating global energy transition and sustainable development.



A CHINESE STRATEGY ON THE GLOBAL CHESSBOARD: A TRUE CIRCULAR ECONOMY MODEL

Leveraging its diversified industrial strengths, Shanghai Electric has pioneered and implemented a “full-stack” zero-carbon industrial park solution, centered on the development of green, low-carbon campuses and sustainable manufacturing systems. By integrating cutting-edge technologies in wind power, photovoltaics, hydrogen energy, smart motors, and AI algorithms, the company has constructed a multi-energy complementary energy management framework, realizing low-carbon transformation across the full life cycle from planning and design to construction and operation.

This solution features integrated technical synergy, such as integrated wind-solar-storage-hydrogen power supply, AI-driven energy efficiency optimization system, and deep decarbonization technologies embedded in industrial operations, aiming to create a zero-carbon, green, and smart park benchmark. As a pioneer in zero-carbon innovation, Shanghai Electric has already demonstrated its technical roadmap through the Minhang Development Zone Zero-Carbon Demonstration Park, offering a replicable model for other industrial campuses to achieve carbon neutrality, and empowering the green transition with advanced solutions.

This global deployment is far more than simply exporting products. “We’ve built our first overseas zero-carbon industrial park in Thailand,” said a Shanghai Electric representative, pointing to an AR-powered digital sand table. “Here, solar panels generate electricity to power water electrolysis for hydrogen production. The hydrogen then fuels port machinery, and the waste heat is reused for seawater desalination. That’s what a true circular economy model looks like.”

Shanghai Electric’s wind power business spans the entire value chain, from the design, R&D, manufacturing, and sales of wind power equipment to operations & maintenance services, wind resource development, and investment, upgrading from product export to technical standard

export and industry ecosystem export. With its advanced manufacturing capabilities, the company is actively extending its wind power equipment solutions to different countries and deployment scenarios.

Shanghai Electric has delivered core turbine systems for numerous landmark projects. In offshore wind power, it supplied Asia’s first offshore wind power project (China’s first 3.6 MW offshore wind farm) — Donghai Bridge Wind Farm in Shanghai, enabled the large-scale deployment of high-capacity turbines with China’s first 7 MW unit (Fujian Sanchuan Project), first 8 MW unit (Changle Offshore C Zone Project), first 11MW unit (SPIC Jieyang Shenquan II Project), continuously breaking domestic records for single-unit capacity, and pioneered the world’s



first floating wind-solar-fishery integrated demonstration project, combining 4 MW wind turbines with lightweight PV modules on water, while carrying out aquaculture operations below, harmonizing energy production and ecological conservation.

In onshore wind power, Shanghai Electric played a key role in the Senj 156MW Wind Power Project in Croatia, the country's largest installed new energy project to date, and a flagship of EU-China green energy collaboration. By integrating technological innovation with Belt and Road energy collaborations, Shanghai Electric has demonstrated full-chain innovation capabilities and market leadership in wind power. Guided by China's dual-carbon strategy, the company's

project implementations go beyond mere technology transfer. They have established scenario adaptation and global deployment frameworks. This systematic solution model, spanning R&D, manufacturing, and O&M, delivers a Chinese paradigm for worldwide green energy transition, cementing Shanghai Electric's vanguard role in the global wind power ecosystem.

What stunned international peers most was Shanghai Electric's rapid evolution. This was a company showcasing 16MW+ floating offshore wind turbines just last year, now it has unveiled a 25 MW "deep-sea giant". Precision bearings they used to import are now among their top exports. "It's like watching a sapling grow overnight into a towering tree," said one expert. **D**



INSIGHTS



EXCELLENCE THROUGH CRAFTSMANSHIP

ZHANG YI

Shanghai Craftsmen, Rotor Section Chief at
Shanghai Electric Power Generation Equipment
Co., Ltd. Turbine Plant

ZHANG YI

Recently, the Shanghai Federation of Trade Unions announced the 2024 list of "Shanghai Craftsmen," honoring 105 outstanding individuals across the city. Among them stands Zhang Yi, rotor section chief at the Shanghai Electric Power Generation Equipment Co., Ltd. Turbine Plant ("Turbine Plant"). This recognition follows his previous accolade in October last year, the State Council Special Allowance, and adds to a long list of honors, including Shanghai Worker Pioneer (2017), Master of Skills in Minhang District (2018), Chief Technician of Shanghai (2019) and "Contemporary Minhang Craftsman" (2019). Behind these accolades lies not only years of relentless dedication and innovation, but also the solid support of the enterprise platform that nurtured his growth, and his own passion for mentoring the next generation.

RIGHT TIME, RIGHT PLACE

In September 1995, Zhang Yi joined the rotor assembly group of Turbine Plant as a fitter fresh out of technical school. "Back then, everything felt new to me. I wanted to immediately understand everything I didn't know," Zhang recalled. That modest sentiment masks the fact that he demonstrated exceptional professional aptitude and strong learning ability from day one.

At the time, intermediate skilled workers were ranked from Level 4 to Level 6, with a standard promotion path requiring a two-year wait between exams, which means it typically took at least six years to move from Level 4 to Level 6. If a worker failed an exam, it would take even longer. However, to encourage self-development, the company had a mechanism in place for exceptional talents: a factory-wide "Fitter Skill Competition." Winning first place would allow participants to skip the wait and attempt higher-level assessments immediately. Zhang Yi seized this opportunity. In a span of just three months, he won first place in both the Level 4 and Level 5 competitions, earning a rare triple promotion to Level 6 and becoming the youngest mid-level technician in the plant. He was also honored with the "New Long March Commando" title for that year.

In December 1995, Turbine Plant entered a joint venture with the U.S.-based Westinghouse Electric Corporation. As part of the partnership, Westinghouse transferred complete steam turbine technology for capacities ranging from 130 MW to 1,300 MW to Turbine Plant. This marked the beginning of a modernized turbine design and manufacturing system at the plant. However, the establishment of this new system didn't happen overnight. When it came to rotor blade installation, the old technique primarily relied on a "blade + shroud" structure, in which the

blades were connected using grouped rivets. This method was extremely labor-intensive and time-consuming, requiring significant physical effort. The installation process for a single rotor could take up to two months. In contrast, the new Westinghouse technology introduced integrated shrouds. While this significantly reduced manual labor intensity, it demanded far higher precision in aspects such as blade spacing and assembled radial lines. A single improperly installed blade could compromise the integrity of the entire row. Thanks to the relentless efforts of Zhang Yi and his co-workers, they quickly mastered the new installation method, laying a solid foundation for Turbine Plant's future large-scale turbine installations.

In 1999, Westinghouse's power generation division merged with Siemens, and Siemens' advanced design and manufacturing capabilities became essential knowledge for Turbine Plant's engineering team. To master this new technology swiftly, Zhang Yi and a group of colleagues were sent to Germany for a month-long intensive training. "Back then, learning wasn't easy. We didn't have today's convenient video or audio recording tools, and even if we had, we weren't allowed to use them freely. Everything we needed to know had to be memorized," Zhang recalled, tapping his forehead with a defiant look in his eyes. It was precisely this mix of grit, determination, and a refusal to be outdone that helped the Turbine Plant team master Siemens' cutting-edge technology. Upon his return, Zhang Yi took the lead in rotor installation for the Zhejiang Yuhuan Power Plant. This unit began operation in 2006 and became China's first 1,000 MW ultra-supercritical steam turbine. It went on to win the Gold Award at the 2007 China International Industry Fair.

"All the honors I've received are thanks to the stage the factory gave me. What came next was our collective effort and perseverance," he said.

CONTINUOUS IMPROVEMENT

If platforms and opportunities are provided by the company, then the ability to innovate largely stems from one's own attention to detail and reflection in daily work. Over his 30-year career, Zhang Yi has always had a keen eye for identifying problems and solving them.

Along the way, he has spearheaded numerous innovations, many of which have not only saved substantial costs for the factory but also shortened timelines for clients, delivering excellent results.

In steam turbine maintenance, the replacement of rotor labyrinth seals is among the most common issues. Traditionally, the only solution was to send the rotor back to the factory for labyrinth seal machining and repair. However, this method comes with several significant drawbacks. Shipping a rotor is expensive, which costs tens of thousands of yuan per piece, and poses safety risks during transit. Power plant maintenance windows are usually very limited, and the time required to send rotors back far exceeds typical outage durations. For cases involving cylinder deformation, even factory repair takes a long time and may interfere with the plant's production schedule.

With years of experience in seal tooth grinding, Zhang Yi began thinking seriously about redesigning the tools for this task. On-site machining equipment is typically bulky and difficult to transport, while purely manual grinding lacks the necessary precision. What if one could combine the precision of machine tools with the portability of manual methods? Wouldn't that solve the problem? After rounds of brainstorming and prototyping, Zhang Yi invented a portable pneumatic machining tool that strikes the perfect balance between accuracy and mobility. Field trials proved its effectiveness. The new tool reduced the grinding cycle on-site from 15 days to just 5, cutting two-thirds off the original timeline. This innovation saved substantial transportation costs for the factory and drastically reduced downtime for the client. Zhang's invention earned a patent and won the Bronze Medal for Outstanding Invention in Shanghai. It has since been widely adopted by over 50 power plants, including Yangjiang Nuclear Power Plant, Lylang Power Plant, and Fa'er Power Plant, receiving widespread acclaim.

"Many people called these achievements innovations, but honestly, that wasn't my original intent," Zhang reflected. "I just thought, if we can improve this machining process, it could save the factory a lot of money. And I've always believed that every penny saved during production is pure profit for the company. Most importantly, time is what clients care about the most. If we can save them time and save the factory money, why wouldn't we do it?"



PASSING ON KNOWLEDGE, GUIDING THE WAY, RESOLVING DOUBTS

Since becoming a production team leader in 2000, Zhang Yi has successively served as chief foreman, deputy section chief of assembly, and eventually rotor section chief. The manual assembly of steam turbine rotors demands a high degree of technical knowledge, hands-on experience, and skill. It's why cultivating a front-line workforce that is energetic, cohesive, and professionally competent has always been a top priority. Over more than thirty years of production experience, Zhang Yi has developed a series of highly effective mentoring methods. Under his guidance, many young workers fresh out of school have grown into top-tier turbine rotor assembly specialists.

Back when Zhang first joined the factory, mentorship was still very traditional. The saying went, "The master shows the door, but the disciple must walk the path." In practice, this meant a lot of watching, doing, and slowly building experience through trial and error. "The older generation of mentors were bold about letting us try," Zhang recalled. "The equipment back then wasn't as precise as it is now. They'd say, 'Just go ahead. If you do it right, the credit's yours; if anything goes wrong, I'll take responsibility.'" Though a bit rough around the edges, this teaching style was undeniably effective. Many trainees quickly developed a strong sense of intuition and independence, growing into skilled craftsmen.

When it was Zhang's turn to train apprentices, times had changed. With rising living standards, the younger generation found it harder to endure hardship, and many started with less foundational knowledge than before. Recognizing this, Zhang didn't simply adopt the methods of his mentors. Instead, he opted for a hands-on teaching model: pairing new employees with experienced ones in one-on-one mentorships, ensuring that problems were resolved and questions answered in real time. Though slower in appearance, this approach guaranteed that each apprentice received targeted guidance. Once an apprentice completed their "rookie phase," Zhang would create a personalized "skill radar chart" based on their real-world performance. When deadlines were tight, each person would be assigned to the task they were most skilled at. During quieter periods, the team would hold workshops to focus on each member's weaknesses, gradually closing the gaps. These radar charts were regularly updated until each apprentice became a true "hexagonal warrior", well-rounded and proficient in every aspect of rotor assembly.

In the rotor section, there's a saying: "Colleagues during the day, family after hours." Rotor assembly is highly stressful work. Beyond regular duties, frequent overtime is required to meet the tight maintenance schedules of power plant units. Since these maintenance tasks are often unexpected, they place additional strain on middle-aged workers with families. To handle this, the team established a simple rule: no mandatory assignments. Once the number of workers needed was decided, they would volunteer among themselves. And yet, there has never been a shortage of volunteers. You'd often hear someone say: "Hi Zhang, you sit this one out. Doesn't your kid need help with homework?" "Li, head home. If you don't, who's going to take care of your mom?" This familial bond was nurtured little by little in these everyday moments of selflessness.

Since winning its first award, the "Model Team of Shanghai" in 1997, the rotor assembly team has gone on to earn numerous honors, including the "Worker Pioneer" award of Shanghai, "Top 100 Civilized Work Units," "National Outstanding Quality Team of the Machinery Industry," the "Shanghai Electric Youth League Flagship Team," and "Model Staff Home of Shanghai." Their motto, "Meticulous and Striving for Excellence," continues to earn them accolades, and those accolades, in turn, drive them to achieve what once seemed impossible. **D**



A 70-YEAR-OLD INDUSTRIAL GIANT EMBRACES THE HUMANOID ROBOT BOOM

Excerpted from Jiefang Daily

The humanoid robot industry is surging with momentum. Shanghai Machine Tool Works Co., Ltd., a subsidiary of Shanghai Electric Group and a company with over 70 years of industrial heritage, has recently received exciting news: their orders have tripled compared to usual levels.

What does this veteran industrial enterprise have to do with humanoid robots, today's hottest tech trend? The answer lies in the joints of these robots.

For humanoid robots to walk, run, jump,

grasp, and retrieve objects, they rely heavily on a key component—the planetary roller screw. Compact in size but delivering high torque, rapid response, and robust load capacity, this component is installed at the joints of humanoid robots. Its precision directly determines how agile, accurate, and smooth the robot's movements are.

Each humanoid robot requires a dozen or so roller screws in various sizes, and their production output directly limits the pace of mass production of robots. High-precision screw grinding machines determine the output

SHANGHAI ELECTRIC

of these screws.

That's exactly what Shanghai Machine Tool Works has been delivering. Their newly developed 200-series screw grinding machines are capable of machining planetary roller screws and other types, with grinding precision reaching P0, the highest national standard, equivalent to sub-100-nanometer precision (about 1/1000 the thickness of a human hair). For reference, a P0 screw must maintain a motion error of no more than 3.5 Qm across 300 mm of travel.

This level of accuracy places Shanghai Machine Tool Works among the global leaders, with few domestic peers able to match it. Thanks to this core competitive edge, the company has successfully ridden the wave of the humanoid robot boom. This year alone, the sales revenue of the 200-series grinders has doubled the total of the past three years combined.

Why was Shanghai Machine Tool Works able to seize this opportunity? General Manager Wang Yu offered insight: "Although R&D requires significant investment and a long payback period, enterprises with state participation have resilience and perseverance."

In past years, China's machine tool industry faced challenges like low-end involution and overcapacity. Many competitors, seeing no near-term profit, pivoted to other products within two to three years. But Shanghai Machine Tool Works held its ground. "Transformation and

upgrading can't happen overnight. Enterprises with state participation have the strategic stability to stick with the identified direction."

Fifteen years ago, seeing the potential of high-precision roller screws, the company launched a targeted R&D effort to develop the machine tools behind screw production. It established a national technology center and an industry key laboratory. Through long-term collaboration with leading screw manufacturers like Nanjing Technology and Equipment Manufacturing Co., Ltd., and reinvesting 15% of annual revenue into R&D over the past five years, the company has laid a solid foundation.

Now, the boom of the humanoid robot industry has brought a long-awaited spring for Shanghai Machine Tool Works—and a glimpse of an even broader future. If the annual production of humanoid robots reaches 1 million units, the industry will require at least 400–500 new high-precision screw grinding machines, a massive market opportunity.

How fast humanoid robots can "run" depends on how steadily the machine tools can "work." This is a virtuous cycle in action. Driven by emerging industries, machine tools such as grinding machines are experiencing opportunities for technological upgrades. Shanghai Machine Tool Works is racing ahead in digital and smart transformation, developing new products and partnering with more enterprises in cutting-edge fields. Estimates suggest the company is likely to double its revenue by 2027.

Shanghai's solid industrial base has laid strong foundations for new industries, while the rise of emerging sectors is injecting powerful momentum into the transformation of traditional enterprises. In Shanghai and the Yangtze River Delta, new tech tracks and veteran enterprises are working hand in hand, together composing a grand symphony of "Made in China." **D**

RECLAIMING THE RIGHT TO THINK INDEPENDENTLY

By Chen Yue

The Pandora's box of the digital age has been quietly opened. With a simple tap on the screen, we pose questions to artificial intelligence, and from the server clusters, the "data Minotaur" responds with seemingly brilliant answers. Some are enchanted by this instant intellectual gratification, believing AI can help humanity ascend to the pinnacle of civilization and wisdom. But in the polished mirror of technology, I see the shadow of spiritual alienation.

There is no denying that AI's ability to synthesize information is dazzling. Feed it the verses of The Peony Pavilion, and it can instantly distill Tang Xianzu's philosophy of passionate sentiment; input equations from quantum physics, and it will weave a poetic narrative of the universe's origins. This convenience of "outsourced thinking" has allowed laziness to quietly spread. When university students rely on ChatGPT to write essays, when professionals use AI to generate plans and proposals, humanity is gradually handing over its most precious spark of thought to digital puppets, losing the spirit of Socratic questioning in exchange for virtual contentment.

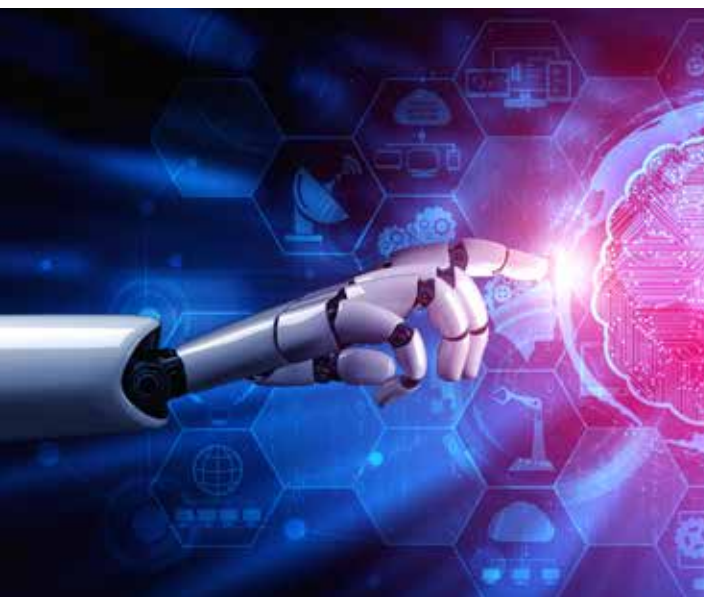
And this alienation is more lethal than any

technological flaw. AI might misinterpret Faust's will to life, but more dangerous is our growing willingness to accept those misinterpretations. Like Perseus borrowing Athena's shield in myth, we are not merely borrowing a tool, we are surrendering the very right to define ourselves. When independent thought devolves into passive consumption, cracks begin to appear in the dome of our spiritual sanctum. The philosophical dilemmas that should haunt us in the silence of midnight, the metamorphoses of thought that require solitude and struggle in the darkest chambers of the mind, all fall silent before the algorithm's model answers.

True intellectual richness is forged through the Promethean struggle. Wang Yangming's enlightenment at Longchang after inner torment, Zhuangzi's transcendence at the Hao River, and Zhang Zai's teary declaration to "establish a heart for Heaven and Earth", all prove that genuine spiritual growth requires venturing into the fog of cognition and undergoing painful self-negation. Yet the shortcuts offered by AI are like the forbidden fruit in Eden, appearing to grant wisdom while in fact robbing us of the noble pain of striving and awakening.

In this sense, AI should serve as the camel on our spiritual expedition, not the galloping horse. It can carry the heavy burden of information, but it cannot replace our trek across the cognitive desert in search of an oasis. Even when AI uses big data to analyze the narrative structure of The Brothers Karamazov, it is still up to us to confront the question: Why love? When algorithms deconstruct Hamlet's existential crisis, we must still grapple with: To be, or not to be? The monuments of the spirit must be built with independent thought that still carries the warmth of life.

Let us be vigilant, lest artificial intelligence become a digital Trojan horse. While we feast on the banquet of machine-generated thought, we may be losing the blueprints for our own spiritual temples. After all, the true radiance of thought is always born in the most subtle folds of the human soul, not beneath the virtual dome woven by code.





以智能 赋能

让每一份力量都不可或缺