

ELECTRIC SHANGHAI

上海电气

DRIVEN BY NEW QUALITY
BY PRODUCTIVE FORCES



FOSTERING NEW QUALITY PRODUCTIVE FORCES THROUGH PRACTICAL MILESTONES

In the pursuit of high-quality development, the cultivation of new quality productive forces has become an intrinsic requirement and an important focus point. This year's Government Work Report has identified "striving to modernize the industrial system and developing new quality productive forces at a faster pace" as the primary task for 2024. "Energy" is mentioned 12 times in the Government Work Report of 2024, and "advancing the energy revolution, tightening control over fossil fuels consumption, and working faster to develop a new energy system." become the guideline of energy transformation.

With a pragmatic strategy, we harness our unique strengths to advance China's manufacturing industry. Green development is the foundation of high-quality development, and the new quality productive forces epitomize green productivity. In recent years, Shanghai Electric has actively embraced the momentum of green development, riding the wave of technological revolution, fostering the new development ecology, and forging a path of high-end, intelligent and green development. On the one hand, it consolidates and expands advantages in "coal, fuel, nuclear" and other traditional energies, while enhancing quality and efficiency, and promoting transformation and upgrading; on the other hand, it is strategically focusing on new energy development, particularly in "wind, solar, storage, hydrogen" and other emerging energy fields.

Shanghai Electric is dedicated to spearheading the development of new quality productive forces, symbolizing advanced productivity driven by innovation and a steadfast pursuit of excellence. How can the group, celebrated for its extensive expertise in manufacturing equipment, accelerate the formation of new quality productive forces? Through a careful examination of the strategies deployed to surmount challenges, we recognize the essence of new quality productive forces in Shanghai Electric's endeavors. By blazing new trails, we have achieved significant accomplishments, such as conducting the successful maiden voyage of the first offshore wind power Service Operation Vessel (SOV) manufactured in Asia, developing the prototype of a pioneering 300 MW F-class heavy-duty gas turbine independently in China, and independently leading the Thar Block-1 Integrated Coal Mine and Power Project within the "China-Pakistan Economic Corridor" framework, encompassing design, construction, and operation phases.

Visionary people can adeptly navigate the present and strategically plan for the future. Moving forward, we aim to capitalize on the emerging opportunities of this era, propel industrial progress with a focus on technological innovation, create an environment that fosters creativity, embark from our current reality towards uncharted horizons, all the while pursuing sustainable development with a focus on excellence in quality.

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Shanghai Electric

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Disclaimer:

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Shanghai Electric Included in the List of Top 50 Overseas Project Contractors for Six Consecutive Years

Recently, China Chamber of Commerce for Import and Export of Machinery and Electronic Products (CCCME) released the list of the top 50 Chinese enterprises contracting large-scale complete equipment projects abroad in 2023. Shanghai Electric ranked 28th with a contractual amount of \$1 billion, making it the sixth consecutive year on the list since the release of the 2018 ranking. In the sub-sector, Shanghai Electric ranked 9th in the contractual amount of power projects, 4 places higher than last year. Specifically, it ranked 8th in thermal power projects, 15th in power transmission projects, 11th in new energy projects (4 places higher than last year), and 13th in solar (photovoltaic) projects (1 place higher than last year).



Two Companies Selected into the City's First Batch of "High-end Equipment" Integration and EPC Chain Masters

The Shanghai Municipal Commission of Economy and Informatization recently announced the city's first batch of integration and EPC chain masters, and 14 companies, including Shanghai Electric Power Transmission & Distribution Group Co., Ltd. and Shanghai Mitsubishi Elevator Co., Ltd., were selected into the "high-end equipment" enterprise list. The selection aims to promote the implementation of the "Guidance on the Development of Shanghai Productive Service Industry during the 14th Five-Year Plan Period", make integration and EPC enterprises play the leading role in the industrial clusters, further empower the advanced manufacturing industry, and help build a modern industrial system.

Shanghai Electric's Thar Project Honored with Pakistan Corporate Social Responsibility Award

Recently, the 16th CSR (Corporate Social Responsibility) Summit was organized by the National Forum for Environment & Health (NFEH) of Pakistan. Power Generation Company and China CEFC Energy Company, working for Shanghai Electric's Thar Coal Block-I Project, both won the CSR Award 2023, which marks the third consecutive year that the project has won the honor in the summit. Notably, the Thar project also won the Women's Empowerment and Gender Equality Recognition Award 2023 as an exemplary organization that promotes gender inclusion and empowerment of women at the recent Employers' Federation of Pakistan (EFP) and the International Labor Organization (ILO) Women's Empowerment and Gender Equality Recognition Award Ceremony.



Shanghai Electric Power Generation Engineering Co., Ltd. Wins the First Order in European Market in 2024

Recently, Shanghai Electric Power Generation Engineering Co., Ltd. has signed a contract for a 56 MW EPC photovoltaic project in Skurtu, Romania, marking the first EPC order in the European market in 2024. The project is located in the village of Skurtu in the territory of Teleorman County, Romania, with a total installed capacity of about 56 MWp, which is expected to provide green power for about 48,000 households and reduce 4,150 tons of carbon emissions annually after completion.

GGSC High-speed Environmentally Friendly Coating and Dyeing Equipment Wins Industry Awards

Recently, Printing and Printing Equipment Industries Association of China (PEIAC) announced the results of the PEIAC Science and Technology Award 2023, and the FP5000TD Fast Reverse Transfer Dyeing Machine developed by Goss Graphic Systems (China) Co., Ltd. won the Third Prize. This equipment is a coating and printing equipment that differs from the traditional cloth dyeing process and dyes cloth on both sides once or several times by means of flexo printing. It uses the mature printing technology to achieve high-speed coating and printing of cloth, with stable printing pressure and excellent coating and printing quality.

Yinghe Technology Selected into Eighth Batch of Manufacturing Champions of Individual Product by MIIT

Recently, the Ministry of Industry and Information Technology (MIIT) announced the list of the eighth batch of Manufacturing Champions of Individual Product, and the self-developed star product "Lithium Battery Coater" of Shanghai Electric's subsidiary Yinghe Technology was selected into the list and certified. As a champion enterprise of individual product, Yinghe Technology, with its core technology and market advantages in the field of lithium battery automation equipment, has achieved remarkable results in high-end equipment manufacturing, new materials, new energy and other fields, highlighting the potential and strength of China's manufacturing industry and setting the pace for other enterprises.



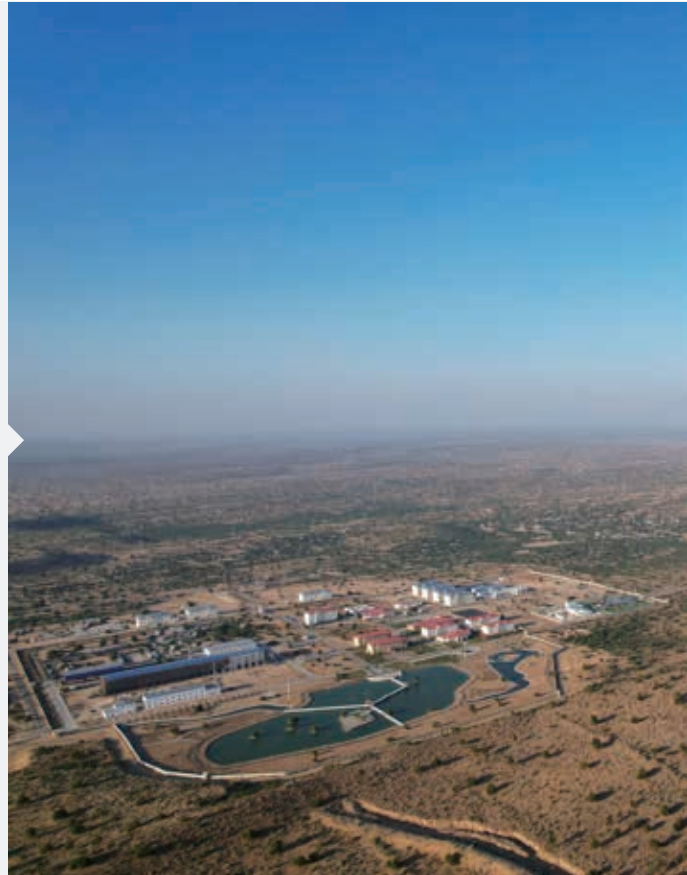


Shanghai Electric Wind Power Wins the Bid for Demonstration Wind Power Project in Indonesia Industrial Park

Recently, Shanghai Electric Wind Power Group Co., Ltd. signed a contract with a member company of Tsingshan for a demonstration wind power project in the Weda Bay Industrial Park in Indonesia. The project is located in Weda Bay Industrial Park in Djailol, North Maluku Province, Indonesia, with a total installed capacity of 5 MW, using two sets of 2.5 MW turbines provided by Shanghai Electric Wind Power, and is scheduled to complete construction in 2024. The total new energy developable capacity of the park exceeds 2 GW, and the two sides will take the project as an opportunity to further explore the subsequent new energy planning and development co-operation in the industrial park, and strengthen the international cooperation and demonstration of green supply chain.

Shanghai Electric Power Generation Group Wins Major Equipment Orders for Two Projects

Recently, Shanghai Electric Power Generation Group has won the orders for the main turbine generator set and auxiliary equipment of China Coal Yuhuan Phase III 1x1060 WM Expansion Project and CHD Kashgar 2x660 MW Cogeneration Project. The two project owners are both repeat clients of Shanghai Electric. Yuhuan Power Plant is China's first power plant equipped with domestically produced megawatt-class ultra-supercritical coal-fired power units. The mechanical and electrical auxiliary equipment for the two one million kilowatt turbines in the second phase of the project are provided by Shanghai Electric, and put into operation at the end of 2007. Kashgar Cogeneration Project serves as a power source to support southern Xinjiang as defined in the "14th Five-Year Plan", and the mechanical and electrical equipment of the two 350,000 kW turbines in the first phase of the project are provided by Shanghai Electric.



Shanghai Electric Attends the 17th China International Nuclear Industry Exhibition

On March 19, the 17th Nuclear Industry China hosted by the Chinese Nuclear Society opened in Beijing. As China's major nuclear island equipment manufacturer, around the nuclear power equipment manufacturing capacity, digital and intelligent manufacturing and other aspects, Shanghai Electric comprehensively demonstrated achievements in recent years in the field of nuclear power. Under the theme of "Supporting the Realization of the Dual-Carbon Goal and Promoting the High-Quality Development of Nuclear Energy", this year's event attracted more than 110 famous enterprises from home and abroad. Moreover, "Nuclear Science and Technology for a Better Life" exhibition, related conferences and other activities were held concurrently.

Shanghai Electric Wind Power Signs an Equipment Contract for HAI ANH Project in Vietnam

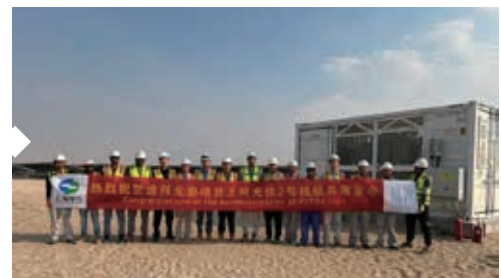
Recently, Shanghai Electric Wind Power made a breakthrough in the overseas market by signing a wind turbine equipment sales contract with the owner HAI ANH, the general contractor ACIT and IPC. The contract involves the HAI ANH 40 MW wind power project located in Lao Bao Town, Huong Hoa District, Quang Tri Province, which covers an area of 855.25 hectares, has an installed capacity of 40 MW, and adopts eight sets of Xcaliber platform WH5.25-172 wind turbines provided by Shanghai Electric Wind Power.

The signing of this contract is another exemplary project of Shanghai Electric Wind Power to respond to the "One Belt, One Road" initiative and actively promote cross-border cooperation in green energy, following the largest onshore wind power project in the Balkan region, the Senj Wind Power Project in Croatia.

Dubai PV Project CSP Zone 2 Achieves Full-capacity Grid Connection

On the eve of the Spring Festival, the 33 MW turbine of connected PV of the 700 MW CSP and 250 MW PV solar power stations of Shanghai Electric Dubai project realized full-capacity grid connection, with all the parameters displaying normal, and all the power receiving equipment running well. The project consists of a 700 MW CSP turbine and a 250 MW PV turbine. Among them, the PV turbine is constructed in two phases, Zone 1 and Zone 2, the designed capacity of PV Zone 1 is 217 MW, and the designed capacity of PV Zone 2 is 33 MW. The full-capacity grid connection of PV

Zone 2 signifies that all turbines of the project are connected to grid on schedule.





**FOCUS
NEWS**



Shanghai Electric Holds the Group Cadre Conference **2024**

On February 26, Shanghai Electric held the Group Cadre Conference 2024 on the theme of "following national strategy, seeking stable progress, making breakthroughs and achieving high-quality development". Wu Lei, Secretary of the Party Committee and Chairman of the Board of Directors of Shanghai Electric Group, delivered a speech. Liu Ping, Deputy Secretary of the Party Committee and President of the Group, gave an administrative report. Cai Xiaoqing, Chairman of the Supervisory Board of the Group, attended the meeting.

In view of the current internal and external situation, where opportunities and challenges coexist, Wu Lei pointed out that it is necessary to clarify a general principle: Adhere to the Party's overall leadership of the Group; clarify a general requirement: Serve the national strategy, closely follow the national demand, and achieve high-quality development; clarify one general goal: Strive to be stronger, better and bigger, and accelerate the construction of Shanghai Electric into a world-class equipment enterprise; carry out benchmarking: Benchmark the world's leading technology, the industry's leading enterprises, and the country's leading examples, pursue steady progress and breakthroughs, and build irreplaceable core competitiveness; adhere to the following contexts: The context of international industrial division of labor and cooperation, the context of

building a manufacturing power, and the context of solution to the national bottlenecks; adhere to the improvement of scientific and technological innovation and market development: Scientific and technological innovation is the foundation, and market development is the key. The two aspects should be both highlighted to enhance the core competitiveness of Shanghai Electric.

During the meeting, the Group's major product research results in 2023 and the "Colorful Shanghai Electric" corporate culture implementation system were formally unveiled. At the meeting, Annual Business Goals and Safety and Environmental Responsibility Agreement 2024 were signed. The Labor Union "One Day Donation" activity and the Group Cadre Selection and Appointment 2023 "One Report and Two Reviews" work were also accomplished.

Zhu Zhaokai, Deputy Secretary of the Party Committee of Shanghai Electric Group and Chairman of the Shanghai Municipal Electrical and Mechanical Labor Union, Dong Jianhua, Party Committee Member and Executive Vice President, and Chen Ganjin, Party Committee Member and Vice President, made arrangement for the priorities. Shanghai Mitsubishi Elevator Co., Ltd., Wuxi Turbine Blade Co., Ltd., Goss Graphic Systems (China) Co., Ltd. and Shenzhen Yinghe Technology Co., Ltd. shared high-quality development experience. **D**

Shanghai Electric and CHN Energy Deepen Cooperation on Green Energy Development



On March 22, Liu Guoyue, Party Secretary and Chairman of the Board of CHN Energy Investment Group (CHN Energy), met with Wu Lei, Secretary of the Party Committee and Chairman of the Board of Shanghai Electric Group, and his delegation at the group's headquarters to discuss further cooperation.

Liu Guoyue welcomed Wu Lei and his delegation and introduced CHN Energy's reform and development as well as its production and operation. Liu Guoyue said that CHN Energy actively serves the national strategy, continues to play the "three roles" of central enterprises, deeply implements the "four guarantees and one priority" development path, makes every effort to guarantee national energy security, actively develops new quality productive forces, and strives to become a world-class leader in clean and low-carbon energy technology. Shanghai Electric is not only the leader in the domestic comprehensive equipment

industry, but also one of the trusted partners of CHN Energy, showing a good foundation for cooperation. The two sides hoped to continue to exert their respective advantages in science and technology innovation, clean and efficient coal power, green hydrogen energy and other aspects, further expand the cooperation, jointly promote scientific research and innovation, and build more demonstration projects to drive innovation and industrial equipment upgrading, accelerate the green transformation of energy, and achieve the "dual-carbon" goal.

Wu Lei thanked CHN Energy for its long-term support for Shanghai Electric, and briefly introduced Shanghai Electric's production, operation and scientific and technological innovation. He said, for a long time, around the national strategy and market demand, Shanghai Electric and CHN Energy established a solid foundation for cooperation in thermal power, wind power, new energy and other areas by jointly implementing quality projects to benefit the people. Shanghai Electric will give full play to advantages in innovation, technology and talent of high-end equipment manufacturing, and actively align with CHN Energy's strategy, to complete equipment supply for existing projects. He hoped that the two sides will take this meeting as an opportunity to further strengthen cooperation in key projects, core technology research and development, etc., to serve the national energy security strategy, and achieve a win-win situation and high-quality development.

Xu Xinfu, Party member and Deputy General Manager of CHN Energy, Jin Xiaolong, Party Committee Member and Vice President of Shanghai Electric, and relevant personnel from both sides attended the meeting. **D**



"Silver Dove Award" announced! Works of Shanghai Electric won awards

Recently, the results of the Shanghai "Silver Dove Award" 2023 were unveiled. Focusing on the international expression of Chinese culture, global promotion of Shanghai's image, capacity building for global narrative and the expansion of the circle of international friends, the award rewards those exemplary and leading international communication works and projects that demonstrate precise communication, effective outreach, and innovative performance. This time, two projects submitted by Shanghai Electric won awards.

Award of Merit in Activity/Case Study Category: From March to June 2023, with the theme of "Enhancing innovation to create world-class enterprises", the Shanghai Municipal State-owned Assets Supervision and Administration Commission, Xinhua News Agency Shanghai Branch and Xinhua News Agency China Economic Information Service jointly planned and carried out a large-scale all-media interview, "Dialogue with Shanghai State-owned Enterprises". Liu Ping, Deputy Secretary of the Party Committee and President of Shanghai Electric Group, joined Xinhua News Agency to share how Shanghai Electric leads high-quality development through scientific and technological innovation, endeavoring to build a world-class equipment enterprise.

Best Video: The video series "Foreign Musician Visiting Shanghai Electric" is a cross-border marketing campaign shown on Shanghai Electric's Facebook page, which showcased the chemistry between industry and music. The campaign features Yukes, a Chinese national instrument player from the United States. In three episodes, "Exploration", "Tour" and "Music", Yukes visited the headquarters and factories of Shanghai Electric to learn about the

business system and future plan of Shanghai Electric while experiencing Shanghai Electric's digital empowerment. He interacted with frontline engineers and experienced the great Chinese craftsmanship. Notably, he performed original compositions on the Chinese zither in front of a 6,000-kilowatt steam turbine at the Minhang Site and the first 10,000-tonne hydraulic press in China. Through his innovative musical expressions, Yukes conveyed to the world Shanghai Electric's century-old spirit of "meticulousness and perfection" and the "10,000-tonne" spirit. As the first attempt at the overseas communication of Shanghai Electric, the series of videos has been disseminated across various domestic and international channels and platforms. This integrated approach has garnered favorable feedback and impressive viewership metrics, further expanding Shanghai Electric's global network.

It is reported that in 2023, "Foreign Musician Visiting Shanghai Electric" also won the "Best Content Marketing Award" of the Digital Marketing Golden Bull Award, and "Best Overseas Brand of the Year" of the Top Brand Innovation Award, among others. With more than 500,000 global fans, since the launch of the Shanghai Electric Facebook page at the end of 2019, it has continuously shared updates on overseas projects, showcased our corporate culture, and narrated Shanghai Electric stories. **D**



The First Prototype of China's Self-developed 300 MW Class F Heavy-duty Gas Turbine Rolls Off the Assembly Line in Shanghai

On February 28, the first prototype of China's self-developed 300 MW Class F heavy-duty gas turbine rolled off the assembly line in Lingang, Shanghai. Jin Zhuanglong, Party Secretary and Minister of the Ministry of Industry and Information Technology (MIIT), attended the roll-off event and delivered a speech, while Xin Guobin, Party member and Vice Minister of MIIT, Chen Jie, Vice Mayor of Shanghai, and Liu Mingsheng, Chairman of the Board of Directors of State Power Investment Corporation, attended the event.

Jin Zhuanglong sent congratulations and thanks to the research and test units and all cadres and workers participating in the project! He said that the assembly and commissioning of the first prototype of the 300 MW Class F heavy-duty gas turbine marked an important milestone in China's independent innovation and development of heavy-duty gas turbines. Over the past eight years, under the strong leadership of the CPC Central Committee with Comrade Xi Jinping as the core, the



entire research and development line has worked hard day and night, mastered a series of key technologies, gone through the entire design and manufacturing process, and launched the first prototype, which is a hard-won achievement with invaluable experience. **D**





Bright-H Technology Releases Z Series New Generation Alkaline Electrolyzer

Recently, the new generation of alkaline electrolyzer (QQSD-Z series) independently developed by Shanghai Bright-H Technology Co., Ltd (hereinafter Bright-H Technology) passed the performance and stability tests and acquired the third-party certification from TÜV Rheinland.

INDEPENDENT RESEARCH AND DEVELOPMENT OF GREEN HYDROGEN TECHNOLOGY

Bright-H Technology has been deeply engaged in independent research and development of green hydrogen technology for a long time, and this new product introduces groundbreaking technological reforms, such as flow field optimization, micro-flow channel and innovative design of gas diffusion layer structure, etc., which significantly reduce the internal resistance, and still can achieve a significant leap in performance when continuing the use of traditional low-cost non-precious metal catalysts and diaphragm materials.

At the maximum load of 167%, the current density is 10,000 A/m², the DC power consumption is only 4.69 kWh/Nm³, the concentration of hydrogen in oxygen is 1.38%, while the concentration of oxygen in

hydrogen is 0.13%.

At a low load, when operating at a current density of 2,500 A/m², the DC power consumption is only 3.77 kWh/Nm³, the hydrogen concentration in oxygen is 1.65%, and the oxygen concentration in hydrogen is 0.24%.

The above excellent performance means that the DC power consumption of alkaline electrolytic water hydrogen production by Bright-H Technology has officially entered the 3.0 era, leading the industry in terms of energy efficiency improvement and promoting the large-scale development of green hydrogen industry. **D**



Maximum operating current density up to **10000A/m²**

DC power consumption as low as **3.77kW-h/Nm³**
2500A/m²

Power consumption within DC load range as low as **20-167%**

Reduce the overall cost of hydrogen production by **13%**

Shanghai Electric Environmental Protection Group Wins Orders in East China and South China

Recently, Shanghai Electric Environmental Protection Group East China regional headquarters won the bid for the main urban heating area cogeneration project of Binhai County, Yancheng City; and South China regional headquarters won the bid for Foshan City's water plant sludge water treatment project. The two new projects are the first projects after the establishment of the East China and South China regional headquarters, marking the milestones of Shanghai Electric Environmental Protection Group's regionalization strategy.

Yancheng Binhai Cogeneration Project consists of 2×75 t/h high-temperature and high-pressure circulating fluidized bed boilers + 2×9 MW class high-temperature and high-pressure backpressure steam turbine generator sets. Shanghai Electric Environmental Protection Group (Shanghai Institute of Mechanical & Electrical Engineering) participated in the project as the technical service provider, providing strong technical and commercial support to the client.

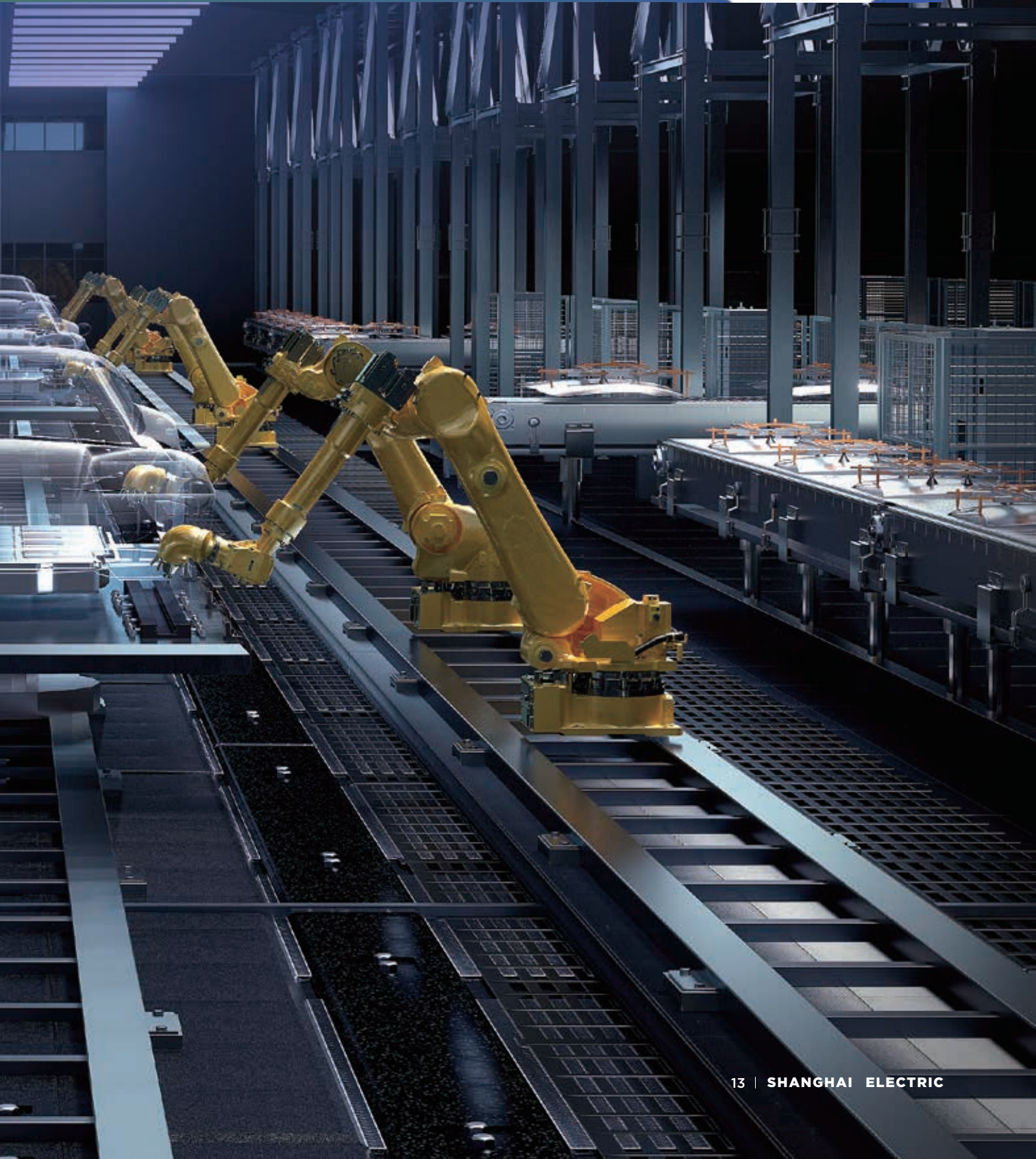
Foshan City Water Plant Sludge Water Treatment Project will build a new set of "high-efficiency concentration + high-pressure plate and frame dewatering" treatment process while keeping existing construction, to ensure the stable operation of the water system and water quality, with the supernatant is reused in the water production process. Shanghai Electric will serve as the equipment EPC of the project and complete the project together with the construction unit. **D**



COVER
TOPICS

SHANGHAI ELECTRIC

DRIVEN | NEW
BY | QUALITY
PRODUCTIVE
FORCES



COVER TOPICS

During this year's two sessions, we frequently heard the buzzword: new quality productive forces. What are new quality productive forces? New quality productive forces refer to innovation-led, advanced productive forces that are freed from traditional economic growth mode and productivity development paths, are high-tech, high efficiency and high quality, and are in line with the new development philosophy.

New quality productive forces promote the momentum transformation and serve as a pivot of high-quality development. They support the innovation and development of strategic emerging industries and future industries, and promote the construction of a modernized industrial system. Over the years, Shanghai Electric has been driven by scientific and technological innovation while pursuing low-carbon, high-efficiency and high-quality development. Shanghai Electric is also accelerating digital intelligence to support the renovation, transformation and upgrading of traditional industries, promoting industrial intelligence and green, high-end development.

The cover topic of this issue will revolve around ten aspects: integrated solid-liquid-gas treatment, energy efficiency improvement through industrial drive, heating and cooling core products, green industrial plant design and construction, waste heat utilization and desalination, low-carbon rail transit, green intelligent manufacturing line, general equipment, smart building low-carbon operation, and digital healthcare, emphasizing the significant features of new quality productive forces such as intelligence, digitization, low carbon, refinement, and high-end production. Are you ready? Let's delve into the new momentum brought by the new quality productive forces.





01

INTEGRATED SOLID-LIQUID-GAS TREATMENT

Following national strategies to reduce pollution and emissions, Shanghai Electric offers independently developed core technology, key equipment manufacturing capacity, rich experience in EPC, and efficient intelligent operation and maintenance strength in the field of environmental protection, such as solid waste treatment, water treatment and air pollution control. We can provide users with **"one-stop service and package solutions"**.



In recent years, with the further development of industrialization and urbanization, the environmental pollution problems caused by solid waste, wastewater and exhaust emissions have become more and more prominent. In order to cope with the increasingly severe environmental problems, China is deeply promoting the implementation of synergy of pollution reduction and carbon reduction, strengthening the integrated treatment of various pollutants and resource utilization, to achieve green and low-carbon development, and help China achieve the "dual carbon" goal.

Adhering to technology innovation, technology integration and technology service, Shanghai Electric focuses on domestic and international innovation resources, and continuously carries out technology research and development, product upgrading in the fields of solid waste treatment, water treatment and air pollution control. We boast comprehensive pollution and carbon reduction solutions supported by various advanced technologies, such as organic solid waste resource utilization and carbon reduction technology, system-wide solid waste

energy/resource utilization technology, and one-stop low-carbon wastewater treatment and resource utilization technology. With digital and intelligent technology, the "solid-gas-water" field has been interconnected and digitalized to effectively improve the environmental cleaning efficiency, operation and maintenance efficiency and energy efficiency.

Shanghai Electric Environmental Protection Group, as one of the core industrial groups of Shanghai Electric, adheres to the green development and science & technology empowerment, constantly upgrades the industrial structure, and promotes industrial integration services, environmental protection, integral energy, civil construction, etc. In the fields such as exhaust gas treatment, waste salt treatment, water treatment, and prefabricated buildings, we continue to carry out technological research and development innovation and product upgrading. We possess more than 50 qualifications of various types and have won nearly 300 project awards at home and abroad. At present, we have built many demonstration projects across China.

COVER TOPICS

01

Project Case

Agricultural Waste Recycling Utilization Project in Chongming

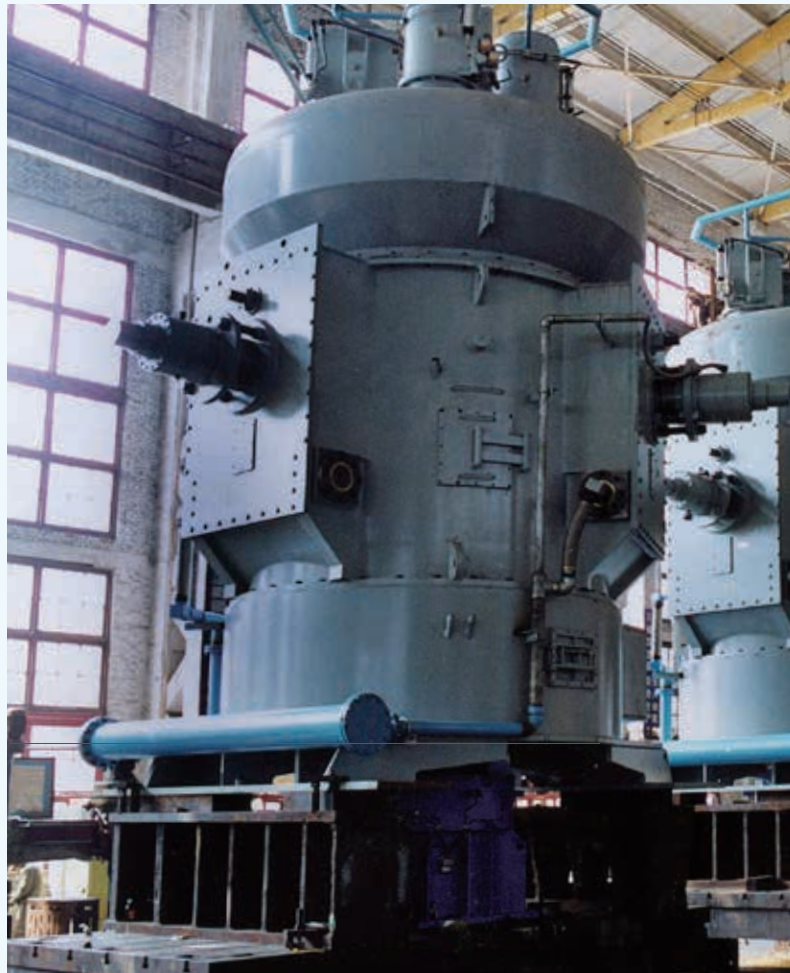
Located in Chongming, Shanghai, the project adopts the Swiss dry anaerobic fermentation core process, which can process 200 tons of manure and 90 tons of straw per day. It is the largest agricultural waste resource utilization project in Shanghai, and also a demonstration project for the development of urban green agriculture in Shanghai in 2019, which was jointly approved by the Shanghai Municipal Finance Bureau and the Shanghai Municipal Commission of Agriculture and Rural Affairs.

The project's annual output of organic fertilizer reaches more than 30,000 tons, and the annual power generation of biogas reaches 5.06 million kWh, which can reduce CO₂ emissions by 30,122 tons/year. It completely alleviates the environmental pollution caused by the unorganized treatment of agricultural and forestry waste and animal manure, effectively contributes to energy saving and emission reduction, and forms a waste biomass-combined heat and power-agriculture circular economy industry chain model.

02

ENERGY EFFICIENCY IMPROVEMENT THROUGH INDUSTRIAL DRIVE

Industrial drive is closely related to energy consumption, and "electric drive" and "steam drive" systems are the most energy-consuming application scenarios in the industrial field. Relying on **solid industrial foundation**, Shanghai Electric has launched high-efficiency industrial drive **system solutions** to help industrial sectors **save energy and reduce carbon emissions**, and **create economic and social benefits together** with customers.





In the context of the dual-carbon policy, improving the efficiency of "electric drive system" and "steam drive system" will be an important issue. By analyzing various industrial drive application scenarios, the "high-efficiency electric drive system" implemented by Shanghai Electric mainly optimizes energy utilization on the power generation side and promotes industrial energy-saving on the power consumption side. The examples include the "steam-power dual drive" system that fully utilizes waste heat and steam to generate electricity on the power generation side, the high-speed direct drive system that converts fuel into electricity and steam into electricity on the power consumption side, the localized high-efficiency retrofit unit, and the general-purpose inverter electric drive system for turbines and mills. By deeply integrating various equipment in terms of performance parameters, it can make room for a significant increase in system efficiency, and the values of energy saving and emission reduction can be accurately calculated. As for the "high-efficiency steam drive system", the industrial turbine achieves high efficiency indexes through AIBT's full three-dimensional through-flow design, and at the same time meets the requirement of optimizing the performance of the non-through-flow part through rigorous CFD and FEA calculations, so as to improve the efficiency to the extreme.

Shanghai Electric will integrate the Group's high-quality resources, vigorously deploy high-efficiency industrial drive systems, promote energy saving and carbon reduction in various fields of industrial drive, provide a package of system solutions, and build a digital operation and maintenance management platform for drive systems, bringing customers a new model of low-carbon, intelligent industrial development.

Project Case

Jinling Power Plant's Renovation of the 1000 MW Dual-drive (Steam and Power) Induced Fan & Booster Fan Integration Project

Huaneng Nanjing Jinling Power Plant is the first 1000 MW steam-power dual-driven induced fan & booster fan integration renovation project in China. Shanghai Electric, as the general contractor, completed all the major equipment supply, on-site construction, and commissioning, and finally delivered a satisfactory solution. After the renovation, the plant's power consumption rate at rated load conditions was reduced by 2.29% and the annual weighted standard coal consumption rate was reduced by 1.2 g/kWh. It is estimated that the annual power sales of the power plant can be increased by at least 130 million kWh, and the revenue from power sales can be increased by at least 15 million yuan. The system renovation project has created significant social and economic benefits for the owner.

This is mainly based on the strong supporting and integration capabilities of Shanghai Electric. The main equipment, including small steam turbine, electric/generator and fan, has maximum efficiency. The three are organically combined in the system efficiency improvement to create high efficiency zones and realize steam-power complementarity and mutual backup, so as to realize energy saving, carbon reduction and reliable operation.



03

HEATING AND COOLING CORE PRODUCTS

The heat pump system adopts air as a low-temperature heat source to generate heat, using only a quarter of the energy of electric heating and half the energy of gas heating, making it the most ideal heating solution available today. Highly's **world's first** dedicated compressor for heat pumps adopts carbon dioxide working fluid, high water temperature in ultra-low temperature operation, and **long-life design**, which is four times longer than the life of ordinary compressors in heat pump systems.

The Highly heat pump compressor is the core component of the energy efficient heat pump system, which can be used for home and building heating, domestic water heating, and washing, drying and caring all-in-one machine, and can also meet the heating and drying needs of industry and commerce.

The large-scale R290 heat pump heating unit equipped with the Highly heat pump compressor is used for home and building heating. The whole system adopts R290 refrigerant, which is low-carbon and environmentally friendly, with a GWP of only 3.3, and minimal atmospheric pollution. The compressor adopts high-efficiency design, which helps the whole unit reach A+++ energy efficiency grade, and adopts the safe and reliable special design of explosion-proof reinforcement for the key parts, which can ensure the stable operation in the low ambient temperature of -30°.

In addition, Highly has developed a high-efficiency green compressor with high water temperature, high reliability and low noise for the wall-mounted heat pump water heaters, which is popular in Europe and North America. In the segment of

washing and drying machine and washing and caring machine, the miniaturized design of Highly heat pump compressor helps to reduce the height of the whole machine, and the super inverter technology also greatly shortens the drying time of clothes.



Project Case

Beijing Municipal "Coal to Electricity" Project

In order to reduce winter coal pollution and improve the quality of life for residents in Beijing's cottage areas, the Beijing Municipal Government has invested more than 10 billion yuan to implement the "coal-to-electricity" project. For the "coal-to-electricity" project in North China, Highly has specially designed a jet-boosting rotor compressor for heating, with power ranging from 2HP to 16HP. Adopting the environmentally friendly refrigerant R410A and the patented jet-boosting technology, it can ensure that the product operates stably at -30°C and increases the heat capacity by more than 30% at -12°C .



04 GREEN INDUSTRIAL PLANT DESIGN AND CONSTRUCTION

Shanghai Electric Environmental Protection Group actively responds to the national "dual-carbon" goal and puts forward the new concept of "building green zero-carbon industrial parks", aiming to provide customers with sustainable, environmentally friendly and efficient industrial park solutions. The company has the **qualification** of municipal-level design institute, the **ability** to provide full process services, rich engineering **experience**, and great technical **strength**.

Shanghai Electric's "Zero-Carbon Eco-Park" is centered on "enhanced peripheral protection, renewable energy utilization, greening, comfortable indoor environment, energy storage, assembly, water conservation and combined electricity, heat and cooling supply", and adopts the modern technological means such as garden architecture, prefabricated buildings and virtual factory, and maximizes the reduction of energy consumption and pollutant emissions through production line planning, logistics, general layout, lean production, production waste treatment and operation management, so as to achieve zero growth of carbon emissions.

Shanghai Institute of Mechanical & Electrical Engineering Co., Ltd., founded in 1953, has participated in the engineering of many national key projects and won more than 300 national and provincial awards. In the course of 70 years of development, it has gradually developed the ability to provide full process services for industrial and civil projects.

COVER TOPICS

In terms of solutions, it proposes low-carbon construction, low-carbon energy, and low-carbon operation and management, aiming to reduce the carbon emissions of the park in a number of aspects, such as digital simulation, forecasting, light energy utilization, sponge city, waste heat recovery technology, digital energy management system, intelligent utility equipment operation and management system, high-efficiency server room operation and management, and intelligent lighting control system.

Project Case

Shanghai Electric Nantong Block AC19013 Project

The project is located in Nantong Central Innovation District by the Zilang Lake, covering an area of 46.6 mu, with the main functions of R&D office and commercial services. It has a total floor area of 95,408 square meters, consisting of floor area above ground of 50,116 square meters and the underground floor area of 45,292 square meters. The design is inspired by the Taihu Lake stones. Through the study of the relationship between Chinese architecture and the application of modern technical means, it reproduces the Jiangnan garden, to provide a refreshing indoor and outdoor communication space for the scientific researchers and to promote creative thinking. The prefabrication rate of the three panels reached 75%, and in the construction phase, the prefabricated building saved about 30% of the construction time, about 30% of the cost, and about 25% of the carbon emissions compared to the traditional cast-in-place method. Through the creation of park landscape and roof greening, the building is green and low-carbon, reducing the carbon emission in the whole life cycle.





05 WASTE HEAT UTILIZATION FOR DESALINATION

Waste Heat Utilization for Desalination F-MED process is a new type of thermal desalination technology independently developed by Shanghai Electric, which realizes the gradual reuse of waste heat resources, and is an energy-saving, environmentally friendly, economical and low-carbon thermal desalination innovative solution. Shanghai Electric can provide tailor-made **personalized total solutions**, and provide customers with professional value-added services throughout the life cycle of the project, to help users improve **system operating efficiency** and **economic benefits**.

Low Temperature Multi-Effect Distillation (LT-MED) is recognized as the mainstream second-generation technology for thermal desalination, which represents the development direction of thermal desalination technology.

Shanghai Electric has independently developed flash-multi-effect distillation (F-MED) technology coupled with low-temperature multi-effect distillation (LT-MED) technology to form an innovative process of waste heat utilization in thermal desalination. The new process will use hot water as a heat source, and through the flash device and the heating steam, waste heat resources can be efficiently reused. It is an innovative, energy-saving, environmentally friendly and low-carbon thermal desalination solution.

The cost of F-MED's water production is less than 3 yuan/ton, which has a great competitive advantage, and its comprehensive cost of water is even lower than the conventional reverse osmosis (RO) process. The water produced by the F-MED system has higher stability, higher reliability, lower power consumption, lower chemical consumption, and better quality. Therefore, for users with hot water waste heat resources, the F-MED process offers a very significant advantage.

Shanghai Electric's F-MED solution will expand the MED application scenarios to realize the recycling and reuse of waste heat resources, which can provide one-stop highly efficient and energy-saving seawater desalination solutions for coastal power, iron and steel, chemical industries, etc., and ensure the provision of high-quality fresh water to customers, with significant social benefits.

Project Case

ZPC Yushan Island Waste Heat Utilization for Desalination Project

ZPC Yushan Island Waste Heat Utilization for Desalination Project is a supporting project for ZPC's 40 million tons/year oil refining and chemical integration project. The project is located in Yushan Island, Zhoushan City, with a total scale of 305,000 tons/day of thermal desalination. Specifically, 7 sets of 15,000 tons/day units will be constructed in the first phase, and 8 sets of 25,000 tons/day units will be constructed in the second phase. It is currently the world's largest hot water flash evaporation thermal desalination project.

The F-MED process package, patented design technology of hot water flash evaporation integrated device and overall solution are provided by Shanghai Electric. Shanghai Electric is also responsible for providing the whole project services including engineering design, equipment supply, equipment installation and commissioning. The project fully utilizes the hot water waste heat resources generated by the refining process and realizes the efficient reuse of hot water waste heat resources. The cost of producing water is less than RMB 3 yuan/ton, with very significant economic benefits. Energy-saving, environmentally friendly and highly efficient, the project has successfully demonstrated the world's leading thermal desalination technology, which marks a milestone for comprehensively enhancing the international competitiveness of localized thermal desalination technology and equipment.

06

LOW-CARBON RAIL TRANSIT

Shanghai Electric is one of the few suppliers and service providers of complete electromechanical equipment systems for rail transit in the world, covering more than 90% of urban rail transit. It has the advantages of **one-stop service, excellent technology, deep integration of various specialized system platforms, and complete coverage of the industry chain.**

Shanghai Electric focuses on the development of rail transit automation systems, such as rail transit signaling system, comprehensive monitoring system, medium-capacity transportation system, and promotes the updating of independent software platforms. Meanwhile, relying on the intelligent maintenance and health management platform, it provides customers with multi-specialty integration of intelligent operation and maintenance services. In addition, it can also supply rail transportation equipment, including vehicle equipment, traction, auxiliary reversing system, depot process equipment integration, and screen door system.

Among them, the rail transit signaling system solution covers a variety of rail transit systems such as metro, light rail and urban express rail. The CBTC signaling system has been serving more than 40 lines and more than 1,500 kilometers of light rail lines in 15 cities such as Shanghai, Beijing, Guangzhou, Wuhan, and Nanjing. eMetro rail transit comprehensive monitoring system establishes an efficient linkage mechanism by connecting and integrating various professional automation systems of urban rail transit. Combined with the "cloud

computing" technology, the comprehensive monitoring system provides a digital foundation for the modern operation and management of urban rail transit, improves the response speed of the operation management personnel, strengthens the responsiveness to emergencies and disasters, and improves the quality and services of urban rail transit.

The exemplary project marks the strategic transformation from "manufacturing only" to "manufacturing + service" of Shanghai Electric's rail transit sector. At the same time, it represents a collaboration with Shanghai Shentong Metro Co., Ltd. by sharing resources and leveraging complementary strengths, and jointly ensuring safe, reliable and efficient operation of Shanghai's ultra-large rail transit network thanks to advantages of "Made in Shanghai" coupled with "Shanghai services".



Project Case

Shanghai Metro Line 5 O&M Project

The O&M project of Shanghai Metro Line 5 targets all equipment and facilities of the line, and is responsible for providing O&M services outsourced for a 15-year period including daily maintenance and emergency repair of all fields, un-wheeling repair and overhaul. The project was implemented across 3 stages: In the early stage, it was mainly engaged in trains, power supply and communication signaling. In the medium stage, it covered electromechanical equipment, including shielding doors, elevators and ventilation, water supply and drainage and electricity systems in the stations. Later, the services were extended to construction and civil engineering works.

Since the agreement was executed, Shanghai Electric rapidly set up a management team, and ensured that the first three professional areas were able to operate smoothly during the transitional period. At present, all parameters have been kept roughly the same as what they were. Shanghai Electric's i-PHmart platform for healthcare & maintenance administration of rail transit addresses the need to reduce payroll, the time for single item examination and maintenance costs and increase efficiency.



07

GREEN INTELLIGENT MANUFACTURING LINE

Shanghai Electric is committed to building an intelligent manufacturing industry chain covering basic components, intelligent equipment, industrial software, system integration and services, and is the world's leading provider of industrial-grade green intelligent system solutions. We can provide **one-stop solutions for factory automation, fast delivery, rich experience, and a wide range of products** to meet the intelligent manufacturing needs of customers in different industries.

In the field of intelligent manufacturing, Shanghai Electric provides efficient and comprehensive electrical solutions with energy efficiency improvement, energy substitution and resource recycling as the main implementation path, helping industrial customers realize green, low-carbon and high-quality development.

We can provide automation products and equipment such as special production equipment for lithium batteries, aerospace automation equipment, industrial robots, CNC machine tools, etc., and deliver more efficient intelligent manufacturing solutions to factories in the fields of lithium batteries, aerospace, automobiles and composite materials. Relying on our rich experience and technical advantages in the field of automation equipment and services, we have built an entire intelligent manufacturing industry chain covering basic components, intelligent equipment, industrial software, system integration, and services, helping our customers reduce costs and increase efficiency.

With the world's leading lithium battery production technology, we can

COVER TOPICS

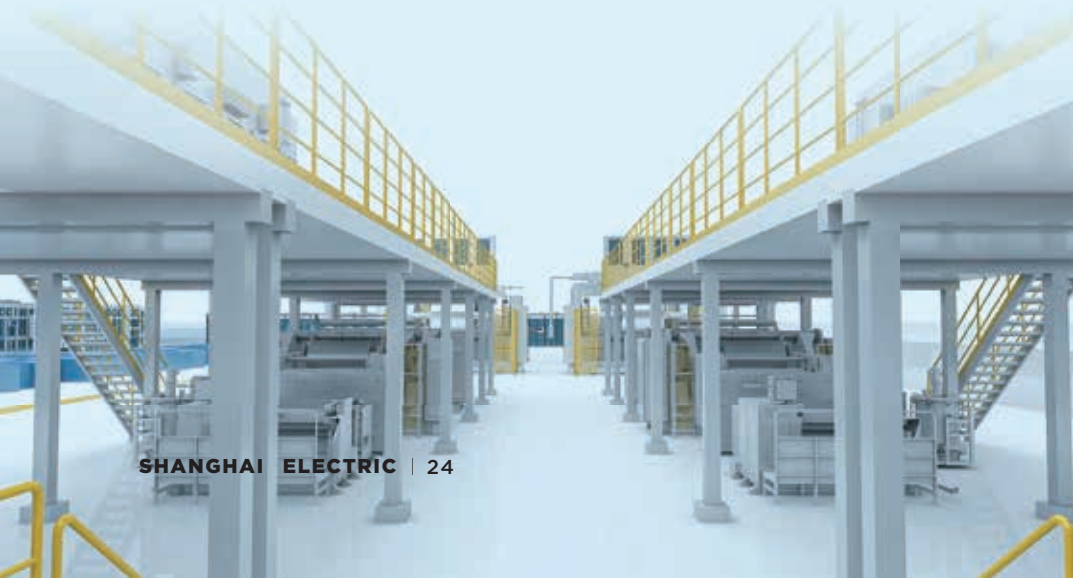
provide customers with a complete set of battery automation production solutions, covering the entire battery production process, fully meeting customers' needs for automation, digitalization and intelligent production, reducing waste and unnecessary steps in the production process, improving production efficiency and quality, and realizing green production.

In the area of digital factory software, we have developed three major software products based on the unified "FOXTEL-BOX" technology: Supply Chain Control Tower (SCM), Manufacturing Operations Management (MOM) and Field Service Management (FSM). Through standardized technologies, systems, and processes, we help users improve manufacturing flexibility and resilience, and reduce production and operating costs.

Project Case

Short Blade Battery Cell Assembly Line Project

The production efficiency of this project reaches 24PPM, which is not only compatible with the mainstream cell production demand in the market, but also the first blade assembly line in the industry to apply magnetic levitation technology throughout the line. To tackle dust control problems, the equipment is equipped with a full range of closed-loop dust removal system, to remove all the dust generated by laser welding, with a cleanliness level of Class 6.





08

DIGITAL HEALTHCARE

The company provides high performance diagnostic and therapeutic medical devices for radio imaging, ultrasonography, and medical robotics, as well as comprehensive solutions with products and services at the core. Shanghai Electric Digital Healthcare offers **"financial support + platform and program + planning and design + system solutions"**.

In 2020, Shanghai Electric Holdings Group Co., Ltd. established Shanghai Electric Medical Group and Shanghai Electric High-end Medical Equipment Research Institute, which is committed to promoting the development of high-end medical equipment localization through scientific and technological innovation. Shanghai Kangda Medical Equipment Group Co., Ltd. under the Group is a manufacturer of high-end medical imaging equipment. Headquartered in the International Medical Park of Shanghai Pudong New Area, it is committed to providing medical equipment for medical institutions, with its business covering "radiography, ultrasound imaging, medical robotics" and other fields.

Shanghai Electric Medical Group has more than 20 wholly-owned subsidiaries, holding companies and shareholding companies at home and abroad. Shanghai Electric Medical Group has set up a wholly-owned subsidiary, Kanda Intercontinental Medical Devices Co., Ltd., in Ningbo, and built the Kanda Intercontinental Meishan Health Industrial Park, which covers an area of 319 mu, with a floor area of 330,000 square meters and a total investment of 2.5 billion yuan. The industrial park is the "smart" factory of medical devices, and also a platform for international cooperation.

Shanghai Electric Medical Group boasts a rich product line through independent research and development, foreign cooperation and other forms. The products include CT, MRI, DSA, RF, DR, mobile DR, C-arm, bone densitometer, oral CT, color ultrasound, rehabilitation robots, surgical robots and so on.

Adhering to the brand concept of "Create Our Future Together", Shanghai Electric Medical Group has established a nationwide marketing service network with more than 700 marketing staff and 300 customer service staff. Shanghai Electric Medical Group makes every effort to provide customers with high-quality products and considerate service.

COVER TOPICS

Project Case

Jilin Tertiary Hospital Radiotherapy Project

Formerly known as the Third Clinical College of Norman Bethune University of Medical Science, China-Japan Union Hospital of Jilin University is a large-scale, modernized, comprehensive, tertiary level A hospital integrating medical treatment, teaching, scientific research, prevention, health care and rehabilitation, which is affiliated with Jilin University, a national key comprehensive university directly under the Ministry of Education, and managed by the National Health Commission.

In order to meet the needs of clinical research in radiotherapy, the hospital chose the Apsaras 16CT electro-medical equipment to carry out the relevant medical imaging diagnosis and treatment. The device has a large aperture of 75 cm, which can meet the space requirements of radiation therapy. High-quality iterative reconstruction technology significantly improves image resolution, and Intelli IP generation selection technology and Intelli EC tube current automatic technology optimize the radiation dose to effectively reduce the risk of radiation.



09

SMART BUILDING LOW-CARBON OPERATION

Shanghai Electric is keeping pace with the urban digital transformation, providing more optimized and efficient full lifecycle urban digital services to support the construction of smart cities. We have **professional qualification, comprehensive integration capability and rich experience.**



In terms of intelligent infrastructures, Shanghai Electric has obtained the special engineering qualification for building intelligent system integration and the professional contracting qualification for building intelligent system projects. In terms of information construction, the company has obtained the qualification for computer information system integration. It also has excellent know-how and management skills, and more importantly, a deep understanding of the workflow and management standards of the industry. The company has gathered staff equipped with knowledge and project experience, making it possible to provide professional and integrated solutions.

The intelligent building integrated monitoring system developed by Shanghai Electric integrates the electronic system of the building through the Internet of Things (IoT) technology, which includes five subsystems, namely communication automation system (CA), office automation system (OA), fire automation system (FA), building equipment management system (BA) and security automation system (SA), and the subsystems can be coordinated to realize a high degree of information sharing in the building.

In addition, Shanghai Electric has developed a comprehensive monitoring system for smart parks, which takes industrial or residential parks as an entry point, realizes the integration of information resources with the help of IoT, big data, cloud computing and other means, comprehensively improves the management and control and scientific decision-making ability of managers, accelerates the intelligent upgrading of the parks, and improves the service level.

Project Case

LNK Smart Elevator Digital Solution

Shanghai Hongqiao International Airport, known as the "Gateway of the Century, Hub of the World", is one of the busiest airports in China, with a daily passenger throughput of more than one million. LNK provides a wireless IoT solution to eliminate the management need of relocating the elevator control room for 3 km. LNK upgraded all brands of elevators in the airport to manage all devices on the same platform.

Huashan Hospital, affiliated with Fudan University, is ranked 7th among the top 100 hospitals in China in 2023 and is a pioneer in the digital transformation of "smart healthcare". Shanghai Mitsubishi supplied all 147 elevators for the main campus, the north campus, the west campus and the east campus. With the highest level of information security in the industry, it meets the requirements of government regulations and customer-specific information management.

Shanghai Mitsubishi Elevator Co., Ltd. integrates 9 digital products, (CloudView, CloudCare, CloudSet, CloudBroadcast, CloudService, Efficiency Mode, Intelligent Elevator Calling, Wireless Calling, and OpenAPI) from intelligent elevator management, intelligent elevator riding, intelligent connection, and intelligent service, according to customers' needs and thorough research and analysis of the market, to help elevator administrators, passengers, government regulators, and maintenance service providers.

10

GENERAL EQUIPMENT (MACHINE TOOLS)

Shanghai Electric has always focused on the research, development and production of grinding machine products, and is a leading company in this field in China. With more than 600 types and specifications of products focusing on **"specialization and sophistication"**, it basically covers all kinds of grinding machines, and its technology and quality are **at the forefront in China**.

With our expertise, we can design and manufacture large precision grinding machines as well as medium to high-grade CNC machine tools. The products Shanghai Machine Tool Works offers include over 200 different varieties and 600 specifications of high-precision CNC grinding machines, intelligent machine tools, flexible machining units, intelligent manufacturing units, and more. A wide range of industries use our

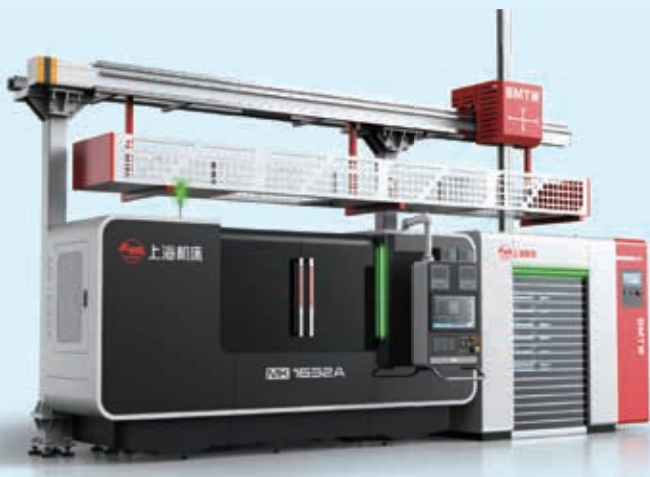
machines, including automobile, aerospace, steel metallurgy, and engineering machinery. We are committed to providing exceptional machine tools and services to China's equipment manufacturing industry.

Shanghai Machine Tool Works has been producing all kinds of grinding machines since 1950, representing the pioneer and cradle of China's grinding machine manufacturing industry. It is a backbone enterprise in the first tier of the domestic machine tool industry, and is now the Vice President of China Machine Tool & Tool Builders' Association, the President of China Grinding Machine Branch, and the main drafting unit of the national standard for grinding machines. The company has always focused on the research and development and production of grinding machines, filling the gaps in domestic technology and creating a series of "China's first". It has established a national R&D center, a key industry laboratory, and a grinding machine branch of the National Technical Committee for Standardization of Metal Cutting Machine Tools. The total number of its patents exceeds 200, and all its products have independent intellectual property.

Project Case

FAW Jiefang Grinding Machine Automation Production Line Project

This production line is equipped with 8 grinding machines, which can meet the user's information integration requirements for automated production. It collects real-time information about equipment operation, production, load, parameters, quality, alarm, grinding wheel, etc., and presents real-time analysis results. Specialized workpiece carrier can complete the automatic loading and unloading of workpieces and manipulators through automatic movement. The adoption of special workpiece drive device and automatic tracking center frame ensures the machining accuracy of the workpieces.





Afterword

Even now, many people still think that intelligent manufacturing is simply automated production. They believe that robots, unmanned factories, black light factories are synonymous with intelligent manufacturing. This is a very one-sided perception of intelligent manufacturing. Now, Shanghai Electric has selected the above ten intelligent manufacturing projects, which cover a variety of industries and lines. Without exception, these projects are of great significance in promoting the high-quality development of the manufacturing industry. They are also fully consistent with the characteristics of new quality productive forces.

The new quality productive forces are the specific embodiment of advanced productive forces. From the perspective of "new", the inherent requirement of new quality productive forces is innovation, including not only innovation at the level of technology and business model, but also innovation at the level of management and system, so as to create an environment conducive to its vigorous development. "Quality" is the stipulation that a thing becomes itself and distinguishes itself from other things. The new quality productive forces are not local optimization and simple upgrading of traditional productive forces, but contemporary advanced productive forces spawned by revolutionary breakthroughs in technology, innovative allocation of production factors, and in-depth transformation and upgrading of industries.

Not only that, as a leader in high-end equipment manufacturing, Shanghai Electric is vigorously implementing high-tech, high-performance and high-quality intelligent manufacturing projects. Taking "energy efficiency improvement through industrial drive" as an example, China's first 1000 MW "steam-power dual-drive induced fan & booster fan" transformation project was completed by Shanghai Electric Power Generation Service Co., Ltd. After the transformation, the power plant harvested both economic and social benefits.

With the support of informationization and intelligence, the new quality productive forces will surely lead the future development and create a brand-new growth model: Production efficiency and added value will continue to improve, and environmental impact will be gradually reduced. Moreover, the new quality productive forces will not only promote the development of existing fields and industries, but also open up new fields and new tracks, and continuously create new drivers and new advantages. **D**

Editor's note

In recent years, ESG has become a buzzword, appearing frequently in the mainstream media. As energy conservation, emissions reduction and sustainable development have become a global consensus, the importance of ESG is increasingly prominent.

Recently, Shanghai Electric's ESG Good Practice Cases 2023 were released after rigorous selection. These cases are about reducing carbon emissions, adopting clean energy or sustainable technologies, using less mineralized resources, promoting biodiversity, protecting local ecology and biodiversity, operating in a reasonable and planned manner, promoting a responsible supply chain to ensure labor compliance, safety, welfare protection and environmental friendliness of all partners, investing in social and public affairs and special projects to help eradicate extreme poverty and support healthcare... They fully demonstrate the excellent performance and successful experience of Shanghai Electric's various companies in the fields of environment, society and governance. From this issue, this magazine will select and publish good practice cases for our readers.



Bright-H Technology: Zero-carbon “Wind, Solar, Storage, Charging, and Hydrogen” Demonstration Project

Bright-H Technology's “Wind, Solar, Storage and Hydrogen” zero-carbon demonstration project starts from PEM, extends to the entire industrial chain of hydrogen storage and use, and combines wind and solar distributed energy generation with high volatility to realize self-sufficiency of green integrated energy. The project is a typical case of technological innovation and energy transformation, demonstrating the company's strength and potential in hydrogen energy technology innovation.

Hydrogen energy is a new growth point for building a green and low-carbon industrial system and achieving industrial transformation and upgrading. The transformation of energy structure plays a decisive role in achieving China's goal of carbon neutrality, and the project marks a breakthrough in exploring the development and commercial application of hydrogen energy technology. With the implementation of the project, the company has made key breakthroughs in the research of new energy storage, hydrogen energy and other major key technologies, which can significantly improve the core technology and process of the hydrogen energy industry.

The zero-carbon “wind, solar, storage, charging, and hydrogen” demonstration project adopts the integrated “renewable energy power

generation + PEM + hydrogen storage + fuel cell power generation”. The power is generated from renewable energy sources (wind and solar) and supplemented by fuel cell power generation at valley time periods, realizing green integrated energy self-sufficiency and “zero carbon emission from hydrogen production”.

In the future, Bright-H Technology will rely on the basic chain of the project to extend and supplement the chain of the whole hydrogen energy industry chain, attract high-end talents at home and abroad, actively cultivate a group of engineers, promote the development of key technologies of electrolyzers and hydrogen production systems, and solve the bottlenecks. We will also strengthen the synergy of related enterprises within the Group and take advantage of resources of the Hydrogen Energy Industry Alliance to create an industrial convergence advantage and make the hydrogen energy industry chain bigger and stronger. **D**





Stabilizer for Wind and Solar Power Generation

Currently, China's installed capacity on the grid ranked first in the world with the high-speed development of wind power, photovoltaic and other new energy. When wind and solar power systems connect to the grid, they encounter issues such as power fluctuations and voltage instability. Distributed synchronous condenser is a power system equipment used to adjust the power factor of the grid and improve voltage quality. It can realize flexible and on-site reactive power compensation and provide inertia support, which can effectively improve the power factor of the grid, maintain the voltage level of the grid, and inhibit the occurrence of DC system faults. When new energy sources (such as wind power and solar energy) are connected to the grid, the distributed synchronous condenser can assist in balancing the grid, ensuring the stability of power supply, enhancing the consumption capacity of renewable energy sources, supporting the development of non-fossil energy sources, and contributing to the ESG endeavors.

Shanghai Electric Power Generation Equipment Co., Ltd. Generator Plant (hereinafter referred to as "Generator Plant") adopts a serialized and modularized design approach, and follows a

scientific product development process (PDP), to conduct research, design, develop and continually upgrade the new distributed synchronous condenser. On March 25, 2023, the distributed 10-Mvar-class air-water-cooled synchronous condenser was successfully connected to the grid at Zhinquan Wind Farm of Beijing Energy Holding Co., Ltd. on its first attempt. On April 7, 2023, two turbines formally passed the 96-hour test run and were officially put into commercial operation. This project features China's first distributed synchronous condensers in prefabricated cabins, and it also represents China's first distributed synchronous condensers with a closed air-water cooling system. CCTV, People's Daily Online and other authoritative media have highly commended the technological innovation of adopting distributed synchronous condensers to promote the consumption of green power.

In the future, as the proportion of new energy generation increases, the importance of synchronous condensers will be further enhanced. Generator Plant will continue to innovate and upgrade the technology of distributed synchronous condensers to meet the demand for more efficient and flexible regulation of the power system. **D**



WORLD AUTISM AWARENESS DAY

SHANGHAI ELECTRIC HAS A VOLUNTEER TEAM

By Wang Yang

There is such a group of children.

They are far away from real life.

Misunderstanding and ignorance are often the biggest obstacles for them to gain social recognition and support.

They are autistic children.

They are like the stars in the sky, living in a world lonely.

That's why they are also called "children of the stars".



April 2, 2024 marks the 17th World Autism Awareness Day. To help this group of children, the Shanghai Electric volunteer team has been sharing enthusiasm and love to brighten their lives for the past 9 years. They are the Shanghai Electric Wind Power Group's Blue Ribbon volunteer team.

CHASE AWAY LONELINESS WITH LOVE

On March 5, 2015, the Blue Ribbon volunteer team organized a "Run, Lei Feng!" long-distance running fundraising activity, advocating volunteers to donate the money raised to Blue Harbor Autism Mutual Aid Center.

On March 5, 2016, the Blue Ribbon volunteer team came to Blue Harbor Autism Mutual Aid Center to do public services with the "children of the stars". They picked up fallen leaves, cigarette butts, wrappers and other garbage from the street and lawn, and made beautiful handicrafts from the leaves, branches and fallen camellias.

On March 10, 2017, the Blue Ribbon volunteer team completed the innovative handmade "bean toys" with the children at "Blue Harbor" and played games with them. On May 10 of the same year, the Blue Ribbon volunteer team organized a follow-up charity sale themed "Blue Harbor and Love", where all the handicrafts on display were made by autistic children.

On November 20, 2021, September 24, 2022, and July 30, 2023, the Blue Ribbon volunteer team made classic retro bags, baseball caps, and miniature landscapes with the autistic children, and encouraged them to come out of their own world and integrate into society through handicrafts, talent performances, and game interactions.

LIGHT UP THE WORLD OF AUTISTIC CHILDREN

The Blue Ribbon volunteer team of Shanghai Electric Wind Power Group will continue to carry out public welfare activities, raise the awareness of autism, and warm every autistic child as a way to give back to society.



ENERGIZE YOUR INDUSTRIAL AUTOMATION



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