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SHANGHAI ELECTRIC 上海电气

"ENERGY & INDUSTRY" COORDINATED EFFORTS FOR CARBON REDUCTION

上海电气 SHANGHAI ELECTRIC

THE WAY OF TECHNOLOGY: A CONFIDENT AND UNBLINDED CAUTION

As far as we can see, over 80% of the content in mainstream media, self-media, and social media communities are ChatGPT-related or AI-related. What drives the continual expansion of this topic is not only people's curiosity and concerns about artificial intelligence, but also the constant news releases from technology companies.

The narrative is well known: ordinary people from all walks of life start to worry that their jobs would be replaced by ChatGPT. This fear has been around since the birth of the textile machine in the 18th century, and it never gets old.

It is not an overstatement that the high-tech industry will soar even higher despite the lavish praise for various technological revolutions. However, the cover topic of this issue is the equally discussed new energy, which has been the focus of global attention for a long time as a response to climate change and the promotion of green and low-carbon energy transformation. The key to the new energy industry is to enhance the core technology and innovation capabilities, improve product performance and competitiveness, and develop vertical markets.

Some of the new energy achievements have reignited the long-lost surprise, curiosity, awe and enthusiasm for science and technology in the public. It reminds me of the 18th century Europe depicted in The Age of Wonder, a time when new scientific discoveries were being made, people's perceptions were being strongly influenced, and poets were praising science in the language of romanticism. At the end of the book, the author writes: The three most indispensable guarantees for maintaining the continued existence of scientific civilization are to maintain an exploratory spirit, maintain the will to achieve hope, and maintain confidence in the future world - a confident and unblinded caution.

With this confidence, we are collectively painting the technological landscape of the future.

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NEWS OVERVIEW

Highly* Unveils New Products at ISH

On March 13, the prestigious ISH, a world-leading trade fair for HVAC + Water opened in Frankfurt, Germany. Shanghai Highly Electrical Appliances Co., Ltd.* (hereinafter referred to as "Highly") exhibited its latest products and technologies at the fair, presenting its efficient and environmentally friendly products and total solutions for heat pumps to the world. Highly* presented a variety of R290 refrigeration compressors* for the European market at ISH. Being environmentally friendly, R290 compressors feature ultra-low GWP, high reliability and great efficiency. It is a holistic heat pump solution for the energy transition of Europe.

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

Recently, the press conference of 18th China Electric Development Summit Forum & the 22nd China Electric Research Report on Top 100 Enterprises in China's Electric Industry under the theme of "Smart Future Driven by Dual-Carbon Policy" was held in Beijing, at which the 22nd list of Top 100 Enterprises in China's Electric Industry was announced. Shanghai Electric's Wujiang Transformer Co., Ltd. ranked 89th, while Schneider Shanghai Power Distribution Electrical Apparatus Co., Ltd.**, Schneider Shanghai Industrial Control Co., Ltd.** and Siemens Switchgear Ltd., Shanghai** were 50th, 97th and 100th on the list. The list is recognized as the most important annual review and benchmark for China's electrical equipment manufacturers. It comprehensively reflects the current situation of the electric industry with an aim to transform its development pattern, gaining wide attention and recognition from industry players.

Shanghai Electric Energy Storage Technology Wins Two Awards at 2023 China International Energy Storage Conference

The 2023 China International Energy Storage Conference sponsored by fgc360.com and Green Power and Energy Storage Alliance was held in Shanghai from March 28 to 29. Shanghai Electric Energy Storage Technology Co., Ltd. won the "2023 Innovation Award for Energy Storage Technology" and the "2023 Best Energy Storage Battery Brand Award" for its high-quality all-vanadium RFB stack, energy storage products and quality services, highlighting its excellent capability and competitiveness in energy storage field, especially for all-vanadium RFBs.

Shanghai Mitsubishi Elevator's New Product Rolls off the Line

On March 30, the first 10m/s LECHY-H super-high-speed elevator rolled off the production line, marking a major breakthrough in speed. The model's traction machine, control cabinet and major safety components are all independently developed and manufactured by Shanghai Mitsubishi Elevator Co., Ltd. It is a new-generation microcomputer-based variable-voltage variable-frequency high-speed elevator designed for high-end scenarios such as landmark buildings, Grade A office buildings and luxury hotels.

Yinghe Technology Finishes the Phase I Installation of BMW's New Energy Project in Germany

Yinghe Technology Co., Ltd., a subsidiary of Shanghai Electric Automation Group, has successfully completed the phase I installation of BMW's new energy project in Germany. The project is a milestone of Yinghe Technology's global strategy and an iconic project for Shanghai Electric Automation Group to explore the European new energy market and present China's intelligent manufacturing capability to the world. Yinghe Technology will deepen its collaborations with global automotive giants and support Shanghai Electric's global strategy in new energy to make a greater contribution to green development and carbon emission reduction.

Shanghai Electric Signs an Agreement for the Kramayi Energy-Chemical Integration Project in Shanghai

On March 16, the agreement for Karamay Energy-Chemical Integration Project for Carbon Neutrality, jointly initiated by Shanghai Electric Wind Power Group, Jiangsu Coal Chemical Engineering Research and Design Institute, Wuxi Chengtong Guolian Capital Co., Ltd. and Shanghai Shuisugu Hydrogen Technology Co., Ltd., was signed at China Financial Information Center in Pudong New Area, Shanghai. Responding to the national Carbon Peak and Carbon Neutrality goals, the project is a major strategic achievement in promoting energy-chemical integration, enabling the deep integration of coal-based carbon source and "new energy + high-pressure electrolytic hydrogen production". It is of strategic significance for the clean utilization of coal, the transformation of wind and solar energy, the guarantee of national energy security, and the enhancement of the self-reliance of core industrial raw material. It lays a solid foundation for the subsequent promotion and replication of similar projects throughout the country.

Shanghai Electric's Work for Overseas Communication Wins "Silver Dove Award" for Best Design

Recently, the 2022 Shanghai Silver Dove Awards were unveiled, with 166 winning works. Among them, Shanghai Electric's Biodiversity: A Carbon Outlook in H5 for overseas communication stood out to won the Best Design Award. The work displays Shanghai Electric's philosophy and CSR efforts for a greener and low-carbon future and its positive attitude towards environmental protection and biodiversity conservation through the ESG perspective.

Shanghai Electric Constructs a Package of Main Equipment for Guoyue Group's National Demonstration Project

Recently, Shanghai Electric Power Generation Group signed a contract with Guoyue Investment Group Co., Ltd. for the construction of the world's first 700MW ultra-supercritical CFB boiler for the expansion of Guoyue's Shaoguan Power Plant in Guangdong, a national demonstration project. The project features Shanghai Electric's independently developed 700MW ultra-supercritical CFB boiler with the largest single-unit capacity, the optimal parameters, and the greatest efficiency in energy saving and environmental protection in the world. It also represents a major breakthrough with bright market prospects in CFB boiler technology. Moreover, Shanghai Electric will supply ultra-supercritical, primary intermediate reheat, single-shaft, four-cylinder, four-exhaust, double-backpressure condensing turbine, 700MW water-hydrogen-cooled generator and other equipment for the project. At the signing ceremony, Shanghai Electric Power Generation Group also completed the signing of contracts with Guoyue Group for the auxiliary and main equipment of 1×700MW (CFB) coal-fired electromechanical boiler for the Comprehensive Utilization project of Hunan Chenzhou Power Plant, the EPC turnkey project of Shaoguan flue gas decarbonization and comprehensive utilization project, and the EPC turnkey project of Chenzhou flue gas decarbonization and comprehensive utilization project.

Shanghai Mitsubishi Elevator Honored as "Green & Low-Carbon Pacesetter"

Shanghai Mitsubishi Elevator Co., Ltd. was honored as the first "Green & Low-Carbon Pacesetter" in Minhang Development Zone on February 28, with a carbon reduction of more than 6,300 tons over the past year. To achieve high-quality development, the company has been promoting carbon reduction in terms of "awareness," "products," "operational processes" and "life cycle management" in recent years, practicing its green philosophy with new technologies. It will keep moving towards the carbon peak and carbon neutrality goals, promote green low-carbon development, and strive to reduce carbon emissions by 7,350 tons in 2024.

Thar Power Plant Ranks No. 1 in Pakistan for Coal-fired Power Generation at Full Load

The National Grid of Pakistan has announced the latest power generation ranking. The Thar Block-1 Power Station, constructed by Shanghai Electric, has been ranked first among Pakistan's coal-fired plants running at full load by virtue of its low cost. It is the first time the plant has entered the list since it was put into commercial operation on February 5. Reportedly, the National Grid of Pakistan ranks power plants in the country by their generation costs every half month, and allocates power generation from lowest to highest cost price. The top ranking of Thar Power Plant means that it is the preferred choice for the grid with its lowest cost of coal-fired power generation. The ranking proves that the project has advanced technology and design idea for cost control to meet the rules of local market.

Shanghai Electric New Energy Development Launches its First Project

On March 23, Shanghai Electric New Energy Development Co., Ltd. held the launching ceremony for its Wind Power Project for Rural Revitalization in Gongzhuling, Jilin. The project has a planned installed capacity of 40.2MW, including 3 wind turbines with single-unit capacity of 6.25MW-202, 3 wind turbines with single-unit capacity of 7.15MW-202, and a 66kV booster station. It is designed to efficiently utilize the rich wind resources in the area, optimize the energy structure, effectively solve the primary energy shortage, and help reduce GHG emissions. As the first approved rural revitalization project and the first new energy project approved and launched by Shanghai Electric New Energy Development Co., Ltd., the wind farm will significantly enhance the local ecological and economic performance and protect the local natural environment after completion.

Shanghai Electric Enters Romania's Solar PV Market

Recently, Shanghai Electric has officially commenced the construction of 91.54 MW Solar PV project in Palau, Romania, marking its successful entry into the Romanian market. With Shanghai Electric as the EPC contractor, the project involves the procurement of equipment, design, construction, commissioning and O&M for a 91.54 MW PV plant. The preliminary design of the project's overall layout, access roads and cables has been completed, and procurement contracts for major equipment components, brackets and inverters have been signed.

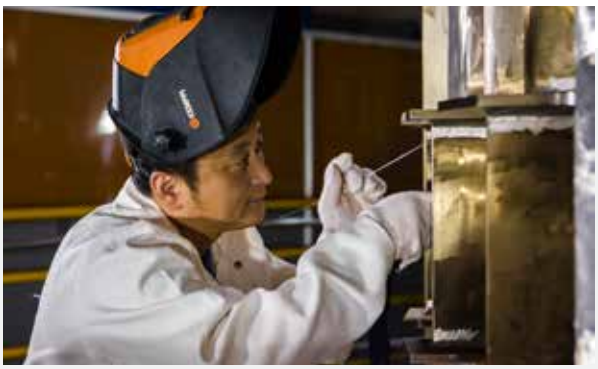
Embarking on the Road towards Innovation

Leading High-quality Development with Chinese Modernization

On February 23, the 2023 cadre meeting of Shanghai Electric was held under the theme of "Maintaining Strategic Stability, Building Consensus for Development, Promoting Transformation and Upgrading, and Leading Shanghai Electric's High-Quality Development with Chinese Modernization". Leng Weiqing, 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 a summary of the work in 2022 and a presentation of work plan for 2023. Cai Xiaoqing, Chairman of the Supervisory Board of the Group, attended the meeting.

The past year was extraordinary for Shanghai Electric. Under the firm leadership of the CPC Shanghai Municipal Committee and Shanghai Municipal People's Government and the guidance of Shanghai Municipal State-owned Assets Management Committee and Supervision and Administration Commission, the Group's Party Committee insisted on the working principle of "seeking progress in stable development, upholding fundamental principles and breaking new ground, and steadfastly pursuing high-quality development" in the past year. The Group has addressed major risks, clarified its strategic objectives and enabled adequate implementation, steadily promoted reforms and kicked off the expansion into new industries. A consensus has been reached on the development paradigm shifting from rapid expansion to high-quality development driven by technological innovation. At present, the Group is experiencing robust growth with many hard-won achievements.

The year 2023 is of great importance as the opening year of Shanghai Electric's comprehensive implementation of the requirements of the 20th CPC National Congress, a key year for the progress of the "14th Five-Year Plan", and a year of technological innovation and industrial transformation. In line with the major strategic plan made by the CPC Central Committee to "improve the modern enterprise system with Chinese characteristics, promote the entrepreneurship, and speed up fostering world-class enterprises", Shanghai Electric is firmly pursuing innovative development, industrial upgrading, high-end and intelligent manufacturing as an SOE while deepening reform with cutting-edge technologies and top talents.



Another Shanghai Electric Employee Selected as a "Shanghai Craftsman"

Recently, the 100 "Shanghai Craftsmen" of 2022 selected by Shanghai Municipal Federation of Trade Unions were announced, and an employee of Shanghai Electric was included.

Chen Baohong is a skillful welder at Shanghai No.1 Machine Tool Works Co., Ltd., a subsidiary of Shanghai Electric. He is a leading expert with 30 years of experience in the welding of reactor vessel internal and control rod drive mechanisms for nuclear island main equipment. He has participated in the development of many advanced reactors, such as the world's first Hualong I reactor, the world's first high-temperature gas-cooled reactor, the first domestic CPR1000 reactor and the first domestic AP1000 reactor, and completed the welding of more than 50 units of various types, including PWTs, high temperature reactors, fast breeder reactors, passive systems, KQ series, etc.

Chen Baohong has always adhered to "Craftsmanship". In his view, such a spirit means dedicating himself to a craft, a career and a faith. He has been devoted to the welding work for decades, overcoming numerous difficulties and challenges with ongoing innovation. Specifically, He obtained a patent for the invention of laser welding process of irradiated sample holder, which broke the monopoly of foreign countries on the welding technology for hook and claw in the driving mechanism. He overcame the bottleneck of laser welding technology for special seam welding in the small-grid header, solved the difficulty in surface shaping of ff automatic welding seam in the middle of CPR1000 control rod drive mechanism, and created the optimal quality, lowest cost and shortest delivery cycle in China with components of "Hualong I" reactor's core measuring instrument.

Shanghai Electric and Siemens Energy Join Hands to Promote Green Transition and Build a Modern Energy System

On March 15, Leng Weiqing, Secretary of the Party Committee and Chairman of Shanghai Electric Group, met with Christian Bruch, President and CEO of Siemens Energy AG (hereinafter referred to as "Siemens Energy"). They exchanged insights on deepening collaborations in various sectors to advance green and low-carbon energy transition in the new era.

Christian Bruch said that in the long-term cooperation between Shanghai Electric and Siemens Energy, both parties had scored great successes, especially in power station equipment, wind power and power transmission and distribution. In the future, Siemens Energy will be dedicated to energy transformation and new energy development, and achieve business decarbonization step by step. Siemens Energy has raised its proportion of non-carbon businesses to 60%, and, in the meantime, has been placing its emphasis on the development of gas-fired power generation, wind power, power transmission and distribution, energy storage, solar energy and hydrogen energy. The service sector in gas-fired power generation is still the primary business for value contribution in Siemens Energy. Gamesa Wind Power will be absorbed into Siemens Energy as a whole. Flexible transmission and energy storage technology will be combined to guarantee the safety of new energy. In the meantime, Siemens Energy will invest heavily in hydrogen energy in the future.

According to Leng Weiqing, Shanghai Electric has made great strategic accomplishments in the 30-year extensive and in-depth partnership with Siemens Energy in energy equipment, building a model for Chinese enterprises to establish joint venture and cooperation with foreign enterprises. Based on the global consensus on carbon emissions and the carbon peaking and carbon neutrality goals of China, we shoulder the common responsibility and mission of green and low-carbon energy transformation, which shows huge market potential. In recent years, Shanghai Electric has given full play to the advantage of the combination of traditional and new energy, accelerated the research, development, promotion and application of such technologies as energy conservation and decarbonization, developed the integral energy solutions that utilize the complementary advantages among "wind-solar-hydroelectric-thermal-storage", and actively built the "omni-directional" new power system. As Siemens Energy is a leader in green and low-carbon energy technology, both parties see huge potential for cooperation in facilitating the construction of the new energy system and exploring energy market in the future. Shanghai Electric hopes that both parties can leverage their own industrial advantages, technology advantages and market advantages, create the innovation ecosystem, develop more innovative and green energy solutions, cultivate more efficient and mutually beneficial business models, and thus build a safe, clean, efficient and sustainable modern energy system.

Shanghai Electric Selected by SASAC as a Demonstration Enterprise in World-Class Specialized and Sophisticated Enterprise Cultivation Program

To speed up incubating world-class enterprises, the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) introduced the "Dual Demonstration" initiative for the cultivation of world-class demonstration enterprises and specialized and sophisticated enterprises to central SOEs and local SASACs, and released a list of such enterprises on March 16. Shanghai Electric Group Co., Ltd. (hereinafter referred to as "Shanghai Electric") was shortlisted as one of the key enterprises in world-class specialized and sophisticated enterprise cultivation program.

The program aims to cultivate a number of world-leading enterprises that can exert a major influence on the supply chain and value chain of the industry. The candidates for World-class Demonstration Enterprises are selected from groups above certain size in industry-leading positions, while the candidates of Specialized and Sophisticated Demonstration Enterprises are mainly from subsidiaries of central SOEs and local SOEs. As a global provider of industrial-grade green and intelligent solutions, Shanghai Electric specializes in three business fields: smart energy, intelligent manufacturing and digital intelligence integration. Over its 120 years of development, it has created many firsts in China and the world, including China's first 6,000 kW thermal generator set, the world's first liquid dual intercooled generator, China's first 10,000-ton hydraulic press, China's first nuclear power unit, and the world's first million-kilowatt ultra-supercritical coal-fired generator. The Group's brands have ranked top in many international and domestic lists.

Leveraging on its technical advantages and ultimate manufacturing capabilities, Shanghai Electric is undertaking many strategic tasks of the country. The group takes import substitution as its own duty, filling many gaps in the manufacturing of key components of major equipment for the country, and greatly promoting the independent R&D capability for domestic high-end manufacturing industry. For example, Shanghai Electric has successfully developed the world's first large forgings for extreme low-temperature environments, complete sets of forgings for heavy-duty gas turbines, and large castings for mega ships, breaking up blockades and monopolies from other countries. The aerospace miniature bearings developed by Shanghai Electric are leading domestic standards. Shanghai United Bearing Co., Ltd. and Shanghai Zhenhua Bearings Factory have been selected as "Little Giant" firms by the Ministry of Industry and Information Technology. They are among the very few designated railroad bearing suppliers certified by the former Ministry of Railways, ranking first in China for the cumulative supply of railroad wagon bearings.

Launching Ceremony of Thar Block 1 Coal-electricity Integration Project Held

On March 22, local time, a launching ceremony was held for the Thar Block 1 Coal-electricity Integration Project in Pakistan, which was built in collaboration with Shanghai Electric. Pakistani Prime Minister Shehbaz Sharif inaugurated the project and delivered a speech at the ceremony. Pakistani Foreign Minister Bilawal Bhutto Zardari, Energy Minister Khurram Dastgir, Sindh Chief Minister Syed Murad Ali Shah and Pang Chunxue, Chargé d'affaires of the Chinese Embassy in Pakistan were present at the ceremony. Leng Weiqing, Secretary of the Party Committee and Chairman of the Board of Directors of Shanghai Electric Group addressed the ceremony via video link.

Sharif highly praised the project team's efforts in completing the construction to a high standard. In his speech, he remarked that Shanghai Electric has made another important achievement under the China-Pakistan Economic Corridor with the Thar Block-1 project. The project has turned the barren desert into a fertile ground for development of modern industry and infrastructure. The electricity generated by the project will be transmitted to all corners of Pakistan, providing a huge boost to Pakistan's socioeconomic development and saving billions of foreign exchange expenditure on energy import for the country. He hoped that the China-Pakistan Economic Corridor will gain continuous momentum for greater prosperity of Pakistan.

Pang Chunxue expressed her gratitude to the Pakistani government and all walks of life for their invaluable support and assistance in the construction of the project, and expressed her appreciation to the Thar Coal Block I Power Generation PVT, China CEFC Energy Company and all the staff of Shanghai Electric who have been working hard in the construction of the project. She emphasized that, as a key energy collaboration project under "China-Pakistan Economic Corridor", the Thar Block 1 project will improve energy structure, enhance energy security and reduce foreign exchange risk for Pakistan. On the occasion of the 10th anniversary of the "Belt and Road" initiative and the 10th anniversary of the "China-Pakistan Economic Corridor", she sincerely hoped that both sides would deepen cooperation to promote the high-quality development of the Corridor and bring greater benefit to the two peoples.

Leng Weiqing expressed her gratitude to the Pakistani government at all levels for their trust and support, as well as to the Chinese Embassy and Consulate General in Pakistan for their care, guidance and assistance during the work of Shanghai Electric, and paid high tribute to every worker. She said, Shanghai Electric firmly follows China's "Belt and Road" initiative to share opportunities and embrace challenges together with the Pakistani people. The outstanding project team has leveraged on their expertise and high-quality products and equipment to lead the project into commercial operation despite the adverse impact of COVID-19, traffic interruptions, difficulties in financing and other challenges. They have presented a gift to the 10th anniversary of the "Belt and Road" initiative and the 10th anniversary of the "China-Pakistan Economic Corridor" with practical actions. She hoped that the two countries would further deepen their cooperation and create a bright future for energy development in China and Pakistan.

At the event, Central Power Purchasing Agency (CPPA-G) of Pakistan presented a certificate for operation of the project to the power generation company and handed over a check for electricity charges totaling nearly PKR 3.1 billion, equivalent to approximately CNY 75.25 million.

The First Hualong I Nuclear Power Unit Put into Operation at Fangchenggang Nuclear Power Plant in West China

On March 25, after the successful 168-hour commissioning test, Unit 3 of the Fangchenggang Nuclear Power Plant majorly owned by the China General Nuclear Power Corporation and jointly built by Shanghai Electric in Guangxi Zhuang Autonomous Region, was officially put into operation as the first Hualong I nuclear power unit in West China and qualified for commercial operation.

Unit 3 of the Fangchenggang Nuclear Power Plant is the first nuclear power unit put into operation with high quality and power generation after the "two sessions". With an annual power generation capacity of nearly 10 billion kWh, rich in technical experience in domestic nuclear power research and development, design, construction and operation, it is tasked with the historical mission of building a series of third-generation nuclear power for China. The commissioning of Unit 3 of the Fangchenggang Nuclear Power Plant further demonstrates the safety and maturity of China's Hualong I, an independently developed third-generation nuclear power technology. It has implemented the idea of "winning the battle of key technology development" proposed in the report of the 20th National Congress of the CPC.

For the Fangchenggang Nuclear Power Project, which will have three phases with a total of six megawatt-class nuclear power units, Shanghai Electric will supply a full set of conventional island steam turbine generator (TG package) equipment including steam turbines, generators and auxiliary equipment, as well as other nuclear island main equipment such as steam generators, reactor vessel internal and control rod drive mechanism.

The two units of phase I has been put into operation in 2016 and produced over 100 billion kWh of clean power accumulatively to the grid. The two units of phase II adopt the Hualong I technology, with an annual power generation capacity of nearly 10 billion kWh per unit. The annual power generation capacity of the Fangchenggang Nuclear Power Project is expected to exceed 34.5 billion kWh after the completion and commissioning of phase I and phase II, which can meet the annual electricity demand of 5.87 million people, reduce the consumption of standard coal by more than 10.4 million tons per year and reduce carbon dioxide emissions by about 28.56 million tons, with environmental benefits equivalent to planting 78,000 hectares of forests.

The World's First Natural Ventilation Direct Air-cooling System Developed by Shanghai Electric Put into Operation

Recently, Unit 1 of Yulin Energy Group's Yanghuopan Project in Shaanxi Province successfully completed its 168-hour full-load test run, during which the unit was stable with satisfactory indicators and parameters. It marked the transition of the world's first natural ventilation direct air-cooling (NDC) 660MW coal-fired generating unit from engineering construction stage to the commercial operation stage with high quality and standard. The system is developed by Shanghai Electric SPX Engineering &Technology Co., Ltd. The project's supply fan, condensate pump motor and pump liquid circulation pump motor are all integrated and supplied by Shanghai Electric Power Generation Group. Compared with the same type of indirect air-cooling unit, it saves energy and has no noise, with wind resistance and good anti-freezing features. It saves about RMB 13 million in electricity consumption, reduces 24,500 tons of coal consumption and reduces carbon emissions by 54,100 tons per year. After the project is put into operation, it will provide reliable electrical energy support for the southward transmission of electricity from the north and the outward transmission of electricity from Shaanxi, effectively improve the local conversion rate and clean energy utilization rate of coal resources in northern Shaanxi, and guarantee the power supply in Central China.

Shanghai Electric's Efficient and Clean Energy Equipment Wins a Large Order from China Coal

Recently, Shanghai Electric Power Generation Group received a notice of award from China Coal Tendering Co., Ltd., announcing that Shanghai Electric had won a large order for a complete set of electromechanical furnace main and auxiliary equipment for a series of double reheat projects from China Coal Group. The tender contains a full set of electromechanical furnace main and auxiliary equipment for 10 units of five projects, including China Coal Shangrao 2×1000MW, Banji Phase III 2×1000MW, Huaibei Guoan 2×660MW, Hefei Phase II 2×660MW and Maoji 2×660MW, with a contract amount of over RMB 10 billion, which is the largest single project tender and proposes the highest technical requirements for equipment in recent years.

The winning of this package project is attributed to the excellent performance and long-term safe and stable operation of Shanghai Electric's ultra-supercritical main equipment in the field of efficient and clean energy, which fully reflects China Coal Group's recognition of the quality of Shanghai Electric's efficient and clean energy equipment, and further consolidates Shanghai Electric's leading position and significant advantages in large thermal power units and further increases the market share of double reheat main equipment.

The five projects, invested and constructed by China Coal Xinji Energy Co., Ltd., mainly located in Anhui and Jiangxi provinces, all adopt the leading power generation technology in China. The boilers adopt Shanghai Electric CT furnaces with single chamber, balanced ventilation, open-air arrangement, solid slag discharge, all-steel frame and full suspension structure design, as well as the fourth-generation complete flow field high-efficiency low-NOx combustion system; the turbines adopt ultra-supercritical, secondary intermediate reheat, single-shaft, five-cylinder, four-exhaust, condensing steam turbines; the generators are water-hydrogen-hydrogen powered, and the auxiliary equipment adopts double-shell, single-flow, surface-type condenser and horizontal surface-type low-pressure heater.

After the project is completed and put into operation, it can effectively alleviate the electricity supply pressure in Anhui and Jiangxi provinces, provide important support and guarantee for energy security, facilitate deeper integration into the "Yangtze River Delta" economic zone and economic and social development of the two provinces, further enhance the level of clean energy utilization and power system operation efficiency, and build a "clean, low-carbon, safe and efficient" modern energy system.

Electricity generation record high! Floating Technology Innovation Award! Shanghai Electric offshore wind power control "wind" rise

As a benchmark enterprise in China's equipment manufacturing industry, Shanghai Electric has been embracing green development and technological revolution in recent years, and green and low-carbon strategy has had a positive effect on its high-quality development. Implementing the requirements of the Group's first cadre meeting in 2023, Shanghai Electric made great achievements and breakthroughs in the field of green wind power in early March.

WIND POWER PROJECTS ACHIEVE RECORD HIGH POWER GENERATION

Deepening the implementation of the leadership role of the Party Committee and promoting the transformation from management to governance is the key. Shanghai Electric should establish a corporate governance mechanism with legal and transparent authority and responsibility, coordinated operation, and effective checks and balances. The group headquarters should establish an efficient control model around "direction, resources, ecosystem, key tasks, and risk control", while the industrial group should focus on the two goals of high-quality development and high-quality return on assets. The enterprises should focus on product competitiveness and strive to achieve cost advantages with leading technology, forming a strong synergy for the high-quality development of Shanghai Electric in the 14th Five-Year Plan period.

FLOATING WIND POWER TECHNOLOGY WINS AN AWARD

Recently, at the China New Energy Power Development Forum & the 7th New Energy Power Plant Design and Equipment Selection Seminar held by the organizing committee of the China New Energy Power Development Forum, Shanghai Electric's floating offshore wind power and fishery farming integration project won the New Energy Power Development Excellence Award (Floating Wind Power Technology Innovation Award).

The project, located on the northeast of Nanri Island in Putian City, Fujian Province, with a depth of about 35 meters underwater, is developed by Fujian Longyuan Offshore Wind Power Co., Ltd. of Longyuan Power Group. A floating wind turbine will be built based on the innovative concept of "generating power and farming fish simultaneously" to realize the shared use of "platform structure, ocean space and operation capabilities". This is the world's first floating offshore wind power and fishery farming integration project, for which Shanghai Electric Wind Power is providing the main equipment and towers.

Taking into account the complexity of the marine environment and the high cost of offshore wind power operation and maintenance, Shanghai Electric Wind Power has fully ensured the safety and reliability of the system from three aspects as design, experimental verification, and digitally-empowered operation and maintenance, in order to ensure the stable operation of the floating wind turbine under harsh offshore conditions for better and sustained harvest of wind power.

In recent years, many countries and regions have started to invest heavily in floating offshore wind power projects and have introduced corresponding support policies to promote its development. The huge potential of floating offshore wind power technology has not only provided a pathway to decarbonization for many countries, but also become the choice in many countries' energy strategies. Under the trend of new energy integration, Shanghai Electric Wind Power will fully tap into the huge potential of floating offshore wind power technology through technological innovation, promote the innovation of modes and application scenarios, realize new scenarios and applications for wind power+, and create a new ecosystem for their co-existence and co-prosperity.

SHANGHAI ELECTRIC WIND POWER RANKS FIRST AGAIN IN CHINA'S OFFSHORE WIND POWER INSTALLATIONS

On 26 February, the 2023 China Wind Power New Year Tea Forum was held in Beijing. According to the statistics of the China Wind Power New Installations 2022 and awards announced, Shanghai Electric Wind Power Group Co., Ltd. (hereinafter referred to as "Shanghai Electric Wind Power") again won the first place in the country in terms of new offshore wind power installations, which is also the eighth consecutive year that Shanghai Electric Wind Power has won the top spot in China's offshore wind power new installations. Specifically, the Zhangjiakou-Beijing Renewable Energy Clean Heat Supply Demonstration Project, the CGNPC Pingtan Dalian 240,000 kW Offshore Wind Farm Project and the Guohua Dongtai Project, which were constructed by Shanghai Electric Wind Power, won the "Innovation Pioneer" award at the forum, and a number of people won the "Outstanding Contribution Award", "Excellent Organization Award", "Advanced Worker Award" and "Youth Pioneer Award".

"ENERGY & INDUSTRY"

COORDINATED EFFORTS FOR CARBON REDUCTION

Energy and industry are the "main battlefield" of carbon peaking and carbon neutrality (dual-carbon policy). As a world-class comprehensive equipment manufacturer, Shanghai Electric, based on its dual-carbon policy, proactively optimizes and improves its industrial structure, and fully leverages its advantages in energy and industrial system solutions, so as to help its clients realize green and low-carbon transformation in their development.

SHANGHAI ELECTRIC BUILDS COHESIVE DECARBONIZATION IMPACT AT THE "MAIN BATTLEFIELD"

As one of China's national equipment manufacturing enterprises, Shanghai Electric understands that industrial upgrading, low-carbon transformation and intelligent development are important drivers to promote the high-quality development of China's manufacturing industry and the construction of a modern industrial system. In the new development stage, Leng Weiqing believes that the manufacturing industry should unswervingly follow a high-end, green and intelligent development path.

Shanghai Electric pointed out that in the future, with a focus on coordination between energy and industry and integrated innovation to advance green transformation, it will combine new energy with traditional energy and break through barriers between energy and industry to form a cohesive impact on decarbonization. Shanghai Electric's leap in its new energy cause will not be possible without technological progress, transformation in marketized tools, systems and mechanisms, as well as innovation in development patterns. The sustainable and healthy development of new energy requires us to improve our competitiveness with the help of marketized tools, and support the smooth construction of new power system. In addition, we also need to join hands with partners in energy and industry to build zero-carbon ecology that celebrates openness, coordination and win-win cooperation, creating a shared zero-carbon future for all.

NEW ENERGY GREETS OPPORTUNITIES FROM "DUAL-CARBON" TRENDS

In December 2022, the Central Economic Work Conference made it clear that we will promote the green transformation of economic and social development, jointly reduce carbon emissions and pollution, and improve coverage of green vegetation and economic growth to build a Beautiful China. Work in the field of energy was only mentioned 3 times in the general script of the meeting, with 3 eye-catching new terms being referred in this concise script. This indicates that there will be some new developments in energy work this year.

New energy is facing great opportunities from "dual-carbon" trends. Currently, China is at the forefront of the new energy revolution and is also the world's largest energy consumer. On the supply side, by the end of 2022, statistics from the National Energy Administration showed that China's total installed generation capacity had reached 2.56 billion kW, including 1.12 billion kW of coal power and 1.21 billion kW of hydropower, wind power, solar energy, biomass and other renewable energy sources. This is a historic feat that the

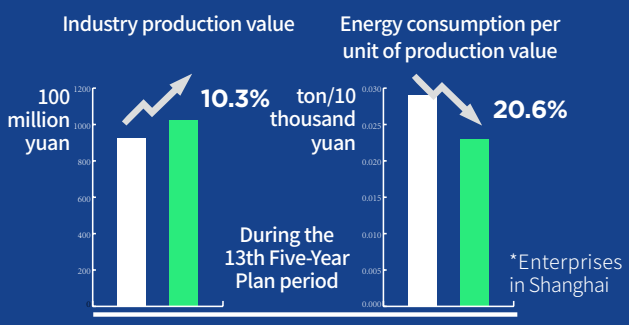
total installed capacity of renewable energy exceeded that of coal power. It is also a landmark achievement after China came up with the idea of a new power system.

The fact that the installed capacity of renewable energy has surpassed that of coal power marks a historic leap in China's energy development. It can be seen that in 2022, the new energy industry has stood at the forefront, and renewable energy has also won a broader space for development.

With strong policy support and cost advantages from technological progress, China's renewable energy has achieved rapid development and built a large-scale complete industrial chain. Since 2016, China's annual installed power generation capacity using renewable energy has accounted for more than half of the newly installed capacity, and played a key role. In 2022, China's newly installed capacity of renewable energy reached 152 million kW, making up 76.2% of the newly installed power generation capacity nationwide and about half of that of the world. Among them, the newly installed capacity of wind power and photovoltaic power increased by 37.63 million kW and 87.41 million kW respectively, totaling 125 million kW and exceeding 100 million kW for three years in a row.

During the important transition from traditional energy to clean energy and under the incentives of peaking carbon dioxide emissions and achieving carbon neutrality, clean energy, represented by hydropower, natural gas, photovoltaic power, wind power, and hydrogen energy will gradually replace the dominant role of traditional fossil energy.

2022 Shanghai Electric EPIs



121,628,500

Total investment in environmental

yuan

221.96

GHG Emission Intensity

tons of CO_2 equivalent / RMB 100 million operating income

2.5

Hazardous waste density

tons of CO_2 equivalent / RMB 100 million operating income

0.5401

Water consumption density

tons of CO_2 equivalent / RMB 100 million operating income

ENERGY AND INDUSTRY SECTORS REDUCE CARBON EMISSIONS SYNERGISTICALLY

At present, green and low-carbon transformation is the only way for enterprises to meet the carbon peaking and carbon neutrality goals, and the energy and industry sectors are the "main battlefield" for decarbonization in China. Therefore, in decades to come, the green and low-carbon transformation of the energy industry across the globe will mainly move towards the following direction: while traditional fossil energy becomes cleaner, and renewable energy more efficient with a larger size, efforts are made to develop a safe, stable, secure and reliable energy supply system that leverages complementary advantages of both traditional and new energy sources. Traditional energy, in particular, is expected to support the development of new energy as the cornerstone in the whole energy mix.

However, due to the lack of overall and systematic planning, transformation initiatives are often "fragmented", restricting deep decarbonization. In this regard, Leng Weiqing suggested that we should accelerate the establishment of an institutional decarbonization mechanism

for energy and industry sectors, break the policy barriers between "energy" at the source end and "industry" at the load end, and form a "decarbonization" synergy.

In recent years, Shanghai Electric has been actively exploring how to cut carbon emissions efficiently by coordinating energy and industry sectors. In the field of energy equipment, while continuing to optimize traditional energy equipment and vigorously developing new energy equipment, Shanghai Electric has also built "new advantages" and cultivated "new markets" through the organic combination of the two. For example, through the addition of two 600MW thermal power units in Guangdong Yangxi Power Plant, the frequency regulation capacity of the power plant has been significantly increased while providing a "buffer" for the large-scale grid connection of new energy.

Following the state energy development plan, more resources will be invested in designing and constructing large wind power and solar energy bases mainly in desert areas. At the same time, coal-fired power plants in their surroundings that use clean, efficient and advanced technology will be upgraded to secure the energy supply. Therefore, a new power system that is primarily based on green and low-carbon energy sources will be built along with UHV power transmission lines that are safe, stable, and reliable. Shanghai Electric has been accelerating the “source-grid-load-storage” integrated development as well as the development of complementary energy sources, like wind and solar power, hydrogen and thermal power, in order to make the electricity system more flexible.

Taking advantage of its full business coverage throughout the “source-grid-load-storage” chain, Shanghai Electric strives to develop holistic solutions for comprehensive zero-carbon industrial parks. From green industrial plant design and construction to distributed new energy supply, from green intelligent manufacturing line to industry-driven energy efficiency improvement, from smart building low-carbon operation to rail transit low-carbon mobility, from waste heat utilization to seawater desalination and to “solid-air-water" synergistic management.....

THE FIRST EPC PROJECT OF DISTRIBUTED SYNCHRONOUS CONDENSERS CONNECTED TO GRID

Expand into new markets and enhance new growth drivers. Recently, China's first distributed synchronous condensers in prefabricated cabins, for which Shanghai Electric acts as the EPC contractor, got connected to the grid in the Zhinvquan Wind Farm of Beijing Energy Holding Co., Ltd. (hereinafter as "Beijing Energy"). Since they were put into operation, the units' performance indicators, including vibration, noise and response characteristics, all met the project's requirements, setting a good example for this kind of project.

Shanghai Electric inked the Zhinvquan EPC project contract with Beijing Energy in October 2022, which is the first "system +" synchronous condensers project for Shanghai Electric Power Generation Equipment Co., Ltd. Turbine Generator Works (hereinafter as "Shanghai Electric Turbine Generator Works"), meaning that its responsibility extends from "supplying equipment" to the grid. According to the contract, Shanghai Electric Turbine Generator Works not only supplies the synchronous condensers, lubricating oil system, cooling water system, online monitoring system and all primary and secondary devices of all electrical systems, but also integrates them in modules into prefabricated cabins for synchronous condensers, oil-water and electricity. In this way, it offers the client the "system solution" and an outstanding demonstration project for potential ones.

The project was designed to take advantage of new technologies and concepts according to local conditions. It uses distributed synchronous condensers in prefabricated cabins that are also a closed air-water cooling ones, which mark China's first by both categories. With prefabricated cabins, the on-site installation requires smaller areas and investment because plants in traditional scenarios are no longer needed, and less equipment commissioning, making the construction period shorter. Meanwhile, synchronous condensers can be deployed in a flexible way based on the location of the new energy power plant for utmost serviceability. Being able to operate in various environments, synchronous condensers can work in new energy power plants' areas that are characterized by extreme conditions including high altitudes, low temperatures, and frequent sand storms. Therefore, units can have a better inner operation condition and work stably for years without being hit by faults caused by pollution, and at the same time, they can reduce the noise across the whole synchronous condenser station by large. This technology solution is proved successful with this grid connection, whose sound operation parameters have been recognized by the client as well.

For the first time ever, Shanghai Electric Turbine Generator Works records a bigger proportion of "integrated system" than synchronous condensers it produces in this "system +" project. Thanks to close collaboration and thorough preparation, technological experts on synchronous condensers and system integration managed to complete drawings of synchronous condensers, equipment and systems and procurement of facilities after being awarded the tender, and allowed on-site construction, installation and commissioning to be performed without any delay. As for project management, Shanghai Electric Turbine Generator Works leveraged its resource advantages to formulate tight schedules for design, supply, construction and commissioning in line with on-site conditions, and finished tasks efficiently while rigorously ensuring construction safety and quality.

SUPPORT HIGH-END UPGRADE WITH TALENTS AND ADVANCED TECHNOLOGY

The energy industry becomes cleaner with low-carbon transition, globally and inevitably. Enterprises are pushed by stricter national policies for energy and environmental protection to produce new energy and smart products, which creates new technological competitions and talent training requirements for businesses.

For instance, PV power plants can be built in many places with adaptations made to local characteristics because solar energy,

an energy source that is accessible across the world and limitless, can help countries and regions to become more independent in terms of energy resources. However, the development of renewable energy, like solar and wind power, is challenged by peaking shaving, energy storage and other high-tech problems on ground that they fluctuate randomly mainly due to weather conditions. Therefore, large-scale development has to remove a number of bottlenecks first, and to make things worse, some new energy industries may even find their technological solution useless.

Hence, innovation is pivotal to an enterprise's high-quality development. Statistics show that Shanghai Electric has invested over CNY 25 billion in science and technology in the past 5 years. The proportion of annual average scientific research investment in operating income exceeded 4%, and hit a peak of the recent three years in 2022.

Investment in science and technology is bringing innovation results. In recent years, Shanghai Electric has been pursuing both independent and open innovation, with a focus on research and development of a number of "advanced technologies" such as floating offshore wind turbines, advanced nuclear power equipment, new energy storage systems, industrial combustion engines and high-end industrial basic parts. Shanghai Electric has provided more resilient, safer and more reliable energy and industrial solutions for various industries, such as ships, large aircraft and new energy vehicles, significantly guaranteeing the security of industrial chain and supply chain.

"The key to promoting scientific and technological innovation is talents." Leng Weiqing said, we need to cultivate a talent team at the source, in order to lay a solid foundation for the continuous and sound development of the industry.

She suggested to take the following actions: Firstly, train the "main force" of talents in universities with accurate alignment of key technological needs, integrate innovation factors, optimize discipline settings, to provide more first-class scientific and technological talents; secondly, leading enterprises play the role of the "locomotive", to promote the deep integration of the industrial chain, innovation chain, talent chain and education chain with the needs of enterprises, and to jointly build future technology colleges, modern industry colleges and technology transfer and transformation platforms; thirdly, establish and improve the evaluation and incentive system in line with the characteristics of research talents' positions; fourthly, leverage public opinion and media to tell good stories of outstanding models, and to create a social atmosphere of respect for science, knowledge and talents.

COMMITMENT TO "DUAL CARBON GOALS"

At the General Debate of the 75th Session of the UN General Assembly (UNGA) in September 2020, President Xi Jinping announced that China would aim to reach peak emissions before 2030 and achieve carbon neutrality by 2060. The "dual carbon goals" are inherent requirements from the perspective of China's high-quality development, and also solemn pledges made by China to the international community.

In recent years, China has made significant achievements in new energy development with

the largest installed capacity around the world, especially wind and solar power. With decreased carbon emissions, industries produce new drivers for green development. Strategic emerging industries including energy conservation and environmental protection expand rapidly and gain more weight in the whole picture. Since the 18th CPC National Congress in 2012, China has afforested an area of 64 million hectares in total with the forest coverage range increased by 2.68% to 23.04%, and the aggregate carbon reserve by 1.375 billion tons to 9.2 billion tons. China honors its word with proactive actions of improving energy structure, industries and forest carbon sink.

At the same time, enterprises make the utmost of policy incentives via forward-looking business planning. Over the past few years, Shanghai Electric has been propelling new energy development, such as wind and solar power, energy storage and hydrogen, and meanwhile, it has accelerated the "wind-solar-hydrogen-storage" integration. It has built a couple of comprehensive new energy bases that piece various areas of new energy development together, helping to attain the "dual carbon goals" in many fields.

In the long run, the market system will play a decisive role in attaining goals of carbon peak and neutrality, which shall truly integrate the top-level design of the basic power market with a number of factors: industrial development and economic growth, capacities of power systems and resource allocation, as well as the problem-oriented mindset and goal-directed mindset. Considering technology as the most important variable and engine, Shanghai Electric has invested a lot into key technologies for new energy and energy storage to realize high-quality development by switching to new growth drivers and improving industrial structures faster. Harmonious co-existence between man and nature will ascend to a higher level as carbon neutrality is achieved and ecological civilization construction creates remarkable benefits. Energy giants are greeted with huge challenges and opportunities, and Shanghai Electric is determined to honor its responsibilities.

CHEN BAO HONG

CHEN BAOHONG

An Interview with Chen Baohong, Welding Expert of No.1 Machine Tool Works and Shanghai Craftsman

A LIFELONG PASSION AND DEDICATION

Chen Baohong is a welding expert praised by all his peers with his 30 years of dedicated service at Shanghai No.1 Machine Tool Works Co., Ltd. (hereinafter referred to as "No.1 Machine Tool Works"). His motto is that nothing about nuclear power is trivial, and it's important to be professional, meticulous, sophisticated and practical at work.

He has developed an unparalleled expertise due to his pursuit of excellence. He has been awarded the titles of Shanghai Technician of Excellence, Master Technician of Shanghai, Pudong Craftsman, Lin-gang Craftsman, Chief Technician of Shanghai Electric, and the latest Shanghai Craftsman, all of which manifest the industry's recognition of his professionalism and personal qualities. Now, he is starting a new chapter in his career.

CHEN BAO

A DILIGENT BEGINNER

In 1994, Chen graduated from the Technical School of Shanghai Industrial Equipment Installation Company with a major in welding, where he developed a keen interest in the profession. "I always think welding is amazing. As the sparks fly, the two iron pieces are joined together. Welders look so cool with a welding torch in one hand and a mask in the other!" The young man had curiosity and admiration for welders dressed in white, but he didn't realize at the time that welding was hard to learn. Welders are exposed to arc flash and burns. "When learning the basics of welding, I was young and did not know how to protect myself well, and I was often hurt by molten iron and sparks. That is the 'tuition fee' I had to pay," Chen said with a sense of humor. Despite his relaxed tone, he has experienced a lot of hardships.

When learning welding skills, Chen's desk and bedside were piled with books and publications of welding. He was so motivated that he could not stand to lag behind others in welding skills, and he would immediately figure out the problems he encountered, enabling his expertise to advance much faster than others. Once, he welded a workpiece with a senior welder, who did much better than him. Stimulated by this, Chen spent his time off sneaking into the workshop to polish his welding skills over and over again. He soon got the hang of it, and even the senior welder gave him a thumbs up when he saw Chen's work.

After graduating from the technical school, Chen entered the Pressure Vessel Factory of Shanghai Industrial Equipment Installation Company. In just a few years, he got the senior certificate and technician certificate, becoming one of the few skilled welders in the company. "Chen is diligent and studious. He will be a good welder!" This was the comment from his mentor and team leader.

A NEW BEGINNING

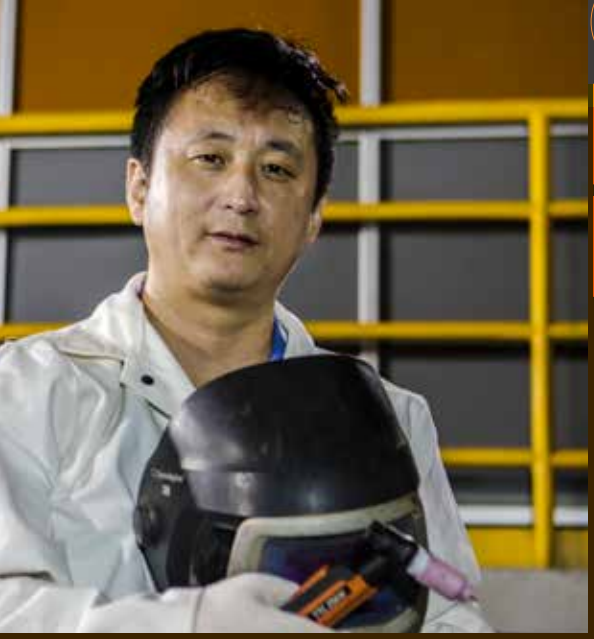
In 2004, Chen has been working in the pressure vessel factory for 10 years. Because of the factory's poor business performance, he wanted to find a new job. "As the saying goes, 'man struggles upwards; water flows downwards'. I was under 30 years old and wanted to reach my full potential." He was introduced to a new job opportunity at No.1 Machine Tool Works, which was located at 700 Wanrong Road back then. Years has passed, and he has become a tenured employee of the company.

No.1 Machine Tool Works has a history of 40 years in nuclear power equipment manufacturing as one of the oldest Chinese companies in the area. It is competent in the manufacturing of reactor vessel internals, control rod drive mechanisms and other equipment for a variety of reactors and technological routes. Chen felt that, compared to the production of pressure vessels, the welding requirements for nuclear reactors are much more demanding, but he is undeterred because he has confidence in his welding skills. Shortly after he joined No.1 Machine Tool Works, a memorable occurrence made him feel more confident in his expertise.

At that time, the factory was making equipment for the Ling'ao nuclear power plant, a project supervised by French experts. One day, he was concentrating on arc welding. A Frenchman looked on for a while and commented that there was something wrong with his welding technique. Chen was confused, not knowing what went wrong. Did the Frenchman know a better method of welding? He stopped what he was doing, expecting the foreigner to show his outstanding skills.

The Frenchman asked everyone else to leave, leaving only Chen and the interpreter. As the saying goes, laymen watch the bustle of the crowd, while professionals perceive the knack and how. After the Frenchman had just welded a rod, Chen spotted several defects in his operation: the welding method would make it difficult to distinguish between weld slag and molten iron because the weld was too thick, and it would be difficult to determine whether the weld is well integrated with the previous layer, so there would be a certain quality risk. The Frenchman listened to him and pondered for a while. Then, he rubbed off the welds he had made, and said to Chen, "Let's weld in your way." "The incident made me feel that although there was a gap between China's manufacturing strength and that of advanced countries, there was no gulf in terms of workers' skills. We Chinese workers can compete with our counterparts in Western countries," Chen remarked.

Since then, Chen has advanced rapidly in his career with growing confidence. He constantly embraces new challenges and reaches new heights



CHEN BAO HONG

by trying new methods and technologies. In recent years, he has successfully fulfilled the welding of reactor vessel internals of the first Hualong One reactor and the world's first Gen VI high-temperature gas-cooled reactor (HTGR), contributing to the development of China's nuclear power.

SOARING TO NEW HEIGHTS

The interview was constantly interrupted by phone calls or visitors asking Chen to attend a meeting or solve some problems at the manufacturing facility. "I'm always on standby to solve welding challenges," He explained smilingly.

Chen have accompanied the growth of China's nuclear power and No.1 Machine Tool Works with his 30 years in the industry. He has participated in the welding of reactor vessel internals and control rod drive mechanisms for nearly 50 reactors, accumulating extensive experience. He believes that experience is the mother of wisdom as he becomes more skilled. During these years, he led the Precision Welding Workshop for Nuclear Power Parts, a team consisting of core technical, quality control and welding personnel, to overcome numerous challenges.

They have overcome a challenge in the ff-shaped weld on the AP100 control rod drive mechanism. Before improvement, the weld had caused scrapping of components due to quality problems Chen improved the welding gun, adjusted the welding parameters, and innovatively improved the filler neck's thickness, angle and gas groove and other factors, greatly enhancing the effects of shielding gas to ensure the quality of the weld. So far, no more piece has been scrapped.

They have overcome the technical problems in IGA component manufacturing. The in-core measurement structure consists of more than 50 components welded together, such as IGA base plate, arch support frame and shaped support frame. The post-welding deformation is large and the dimensions are difficult to control. With no existing solutions to learn from, Chen and his team carried out a lot of pre-welding research and made considerable changes to the process. With homemade tooling, they developed a hierarchical and symmetrical welding sequence from the center to the edge with small specifications, quick procedures, strict control of interlayer temperature, and pre-welding anti-deformation techniques for irregular components, which effectively reduced welding variables and ensured that the dimensions could meet the standards.

They have overcome the technical difficulties for manufacturing of latches. Given that the latch is the core component that determines the nuclear reaction speed, the independent R&D of the overlay double-tooth latch raised many technical challenges. Chen and his team made unremitting efforts to overcome the bottlenecks in latch manufacturing through technology research, structure design and repeated tests, and developed the "overlay double-tooth latch" that fully meets technical requirements for Hualong One. The qualified rate of the product is increased to over 90%, far exceeding the qualified rate of 40% in foreign countries. Meanwhile, the manufacturing cost of a latch is less than one-third of the imported latches, successfully breaking up foreign monopoly.

They also solved the post-welding deformation of the irradiation sample holder. Chen has developed a comprehensive welding process and sequence with special tooling, covering every technique from spot welding and positioning welding to integral welding, with strict control of interlayer temperature to ensure the quality of the weld. He adopted stabilization heat treatment to better control post-weld deformation. Laser welding was applied for the first time to improve production efficiency, reduce costs and deformation, and enhance quality.

"Now, the workshop is tackling welding challenges in the artificial sun and BEST project, studying new welding methods such as laser welding and electron beam welding. We want to contribute to our company as a team," Chen talks about his current work with confidence.

Chen is a native of Shanghai residing in a neighborhood near Wenshui Road. Before No.1 Machine Tool Works relocated, he could ride his bicycle from home to work within a quarter of an hour, so he never got tired even when working overtime. When the company moved to Lin-gang Special Area, he started to take a long shuttle commute. "It's hard, but I love my job, so the difficulties are not worth mentioning."

The Shanghai Craftsman, who aspired to become a welding expert from his youth, has remained true to his original ambition. His family has always given him the greatest support. He said that sometimes, his wife gets up early in the morning to make breakfast before waking him up so that he can sleep for an extra half hour. There are too many warm moments like this to count. Family support has made Chen's heart stronger. "I must work harder and make more achievements to pay back my company and family." After the words, he threw himself into a new challenge.

IS IT TRUE THAT **COST DETERMINES PRICE?**

By Zhang Zhiyang

Cost, demand and price are the basis of modern economics that form the underlying logic of modern society and science. Let's take a look.

If cost determines price, the final selling price of a product is equal to the sum of all the costs, multiplied by a reasonable profit margin. Whatever the reasonable profit margin is, 3%, 5% or 1%, with the profit margin fixed, the higher the costs, the higher the selling price of the product.

So how can entrepreneurs make money? What do they think about every day? The thing they think about is how to make the cost higher. The higher the cost, multiplied by the profit margin, the more money they can make. That's a ridiculous conclusion.

Let's say there's a second-hand bike that's now worth $100, how can you make more money out of it? According to the accounting principles just mentioned, you have to increase the cost of this bike. Paint it, change the wheels, change the transmission, so that this bike becomes a combination of undifferentiated human labor and components. Increased cost for a higher price? The market thinks otherwise.

If the accounting principles just stated are correct, then all the obsolete products in the world will not disappear: can the cost of horse-drawn carriages and old carburetors determine the price? If it is true, the carriages would not have disappeared, nor would the steam locomotives. Whatever the cost is, multiplied by a supposedly reasonable profit margin, it would sell. Then we wouldn't have a new world of smart electric cars, bullet trains, high speed trains and the like.

Cost determinism is wrong. To make it more clearly: the logical relationship implied by cost determinism, that is, the cost of the raw materials for a product determines the final selling price of the product, is wrong.

Supply and demand determine the price of a commodity, and the price of a commodity determines the cost of resources. The opposite is the reasonable logical relationship. It is not the raw material of the product that determines the final selling price of the product, but the supply and demand of the final product that determines the price of the final consumer product, which in turn determines the prices of all the raw materials. Lithium batteries allow smartphones to change our lives, hydrogen allows the world to reduce carbon, and products that reduce greenhouse gas emissions are scarce. Their prices are high because of the difficulty in meeting the high demand for emission reduction. It is the other way round. The supply and demand for the final product determines the price of the final product, and this price in turn determines the cost of the raw materials - the scarce electrodes.

In fact, an entrepreneur, when he produces a product and puts it on the market for sale, will determine the selling price of the product based on the supply and demand. He sets the price at whatever he can (in the scope of market economy) and makes as much money as he can. After this, he then attributes his profit or loss to the factors of production in each of the previous stages. He will put a price on these factors of production and determines their value.

If the entrepreneur makes money and is able to keep these factors of production in his production line, he is able to continue the production, if he can't keep these resources, these resources will be gone, leading to the failure of his business plan. If the capital market is bullish on the future and continues to invest, fostering demand or beating rivals, after the pre-dawn darkness, demand will come up and both entrepreneurs and investors will make money, as shown by CATL, NIO, and e-commerce.

So, there is no reasonable profit margin in the world, businessmen are making as much as they can. After making the profit, they then attribute it to the previous factors of production. Likewise, there is no reasonable loss in the world. There is nothing reasonable or unreasonable in the disastrous loss.

Let's say that, in the CBD of a bustling city, a bowl of beef noodles can be quite expensive. If you ask the boss why it is so expensive, he will say, because the rent for the shop is expensive. You see, the price of beef noodles is determined by raw materials. What he says is true, but he understands the cause and effect relationship in a wrong manner. The correct cause-and-effect relationship is that the CBD is a place where productivity is high and customer traffic

is high, so people are competing for this place, making all the elements here more expensive. Everyone making more money here is willing to dine here, rather wasting half an hour walking further away to have a cheaper bowl of beef noodles. The chances of making more money here is what makes the rent more expensive. The cause and effect relationship is just about in reverse.

During the pandemic, one-way tickets for economy class of flights between the US and China were over $5,000 and reportedly $10,000, which is a dozen times more than before, when you could get a round-trip ticket for $700-800. The cost of jet fuel, flight crews, airports, etc. wouldn't have changed much. But as there were so few flights, the fares just rocketed.

I will give you a plain example to help you understand. Some people say that Faye Wong is paid particularly high for her concerts, so her concert tickets are particularly expensive. Is it right to say that when Faye Wong wants more, her tickets would be sold more expensive? No, it is not correct. It is because fans are competing for Faye Wong tickets, and the higher price they are willing to pay makes Faye Wong's labor resources more expensive. The cause and effect relationship is just the other way round.

Human society has been so developed that the demand for immersion in virtual scenes has increased dramatically. It is no longer only needed in virtual experiments, in fact the very presence of such virtual scenes may have become a consumer hobby. Metaverse technology enhances and expands the economic value of the industry. For a long time to come, not only technology and manufacturing will need the empowerment of metaverse technology, the development of culture and art will also be supported by metaverse technology. As metaverse technology matures and becomes more popular, all important exploratory human activities in the future may have to be virtualized in parallel digital scenarios before the right conclusions can be reached. Thus, human progress will always be accompanied by an increase in virtual capabilities.

With the rise of open and decentralized networks, the era of Internet 3.0 is quickening its steps. To get in the new tracks and to acquire new technologies and products is to seek scarcity, selectively identify demand, and gain high profits. Cost determinism has some strategic value in the plateau phase of a product, but an enterprise believing in "cost determinism" will inevitably fetter innovative ideas. Driven by technologies such as artificial intelligence and virtual reality, the metaverse has also come into being. Through new technologies such as deep interaction and immersion, as well as new demand experiences brought about by disruptive creativity, the virtual space and multi-dimensional time built by metaverse has broken the time limit, and new products, new technologies, new scenarios and new business models are emerging. With metaverse, adapting physical products to demand is made possible without the high cost of trial and error, thus allowing the demand side to enjoy moderate and reasonable prices.

New products, new technologies, new scenarios and demonstration projects driven by new demand in the metaverse field can dovetail with government policies, carry out market-oriented promotion and application, attract social investment institutions, and promote the formation of a good industrial development ecosystem. The alternative price and profitability driven by the new demand for “real-virtual experience" will continue to push up the market value of new companies.

BLOOMING FLOWERS IN OUR HEARTS

The present does not exist naturally. The gaze into the past and the vision of the future give birth to poems or novels, to knowledge, and to ideas. In the threads of time, these creations, at once intertwined and connected, bring together the past and the future to the present, which takes on a shape of its own.

Therefore, we need good books and reading. This year, the Shanghai Electric Education Center, in line with the mission of "providing good and famous books", organized the "Vigor Book Club", with a selection of good books for you. Let's take a little time every day to look into the future and reconnect with the past by following the best works and writers, and read the classics on our shared reading journey!

Recommended Books for the Vigor Book Club 2023

Exploitation of the Works of Nature

Author: [Ming Dynasty] Song Yingxing
Publisher: Northern Literature and Art Publishing House

Learn the spirit of artisanship from history. This book is an encyclopedia of Chinese craftsmanship in the 17th century. The author provides rigorous evidence and accurate data, covering more than 130 production techniques and tools with scientific data of over 30 industries. All things are half-way between the good and the bad, and their strengths can be taken for the reference of people.

I-Power: The Freedom to be Me

Author: George Dieter
Publisher: Jiangsu Phoenix Literature and Art Publishing House

The building of I-power helps us know clearly the scope of our own and others' responsibilities and powers, and know what we can and cannot do. At workplace, this book can help us establish proper boundaries, resolve conflicts, foster good relationships, achieve self-empowerment and live a controlled life.

Real Economy

Author: Li Yining
Publisher: China Literature and History Press

The manufacturing industry is the mainstay of the real economy. Without the high-quality development of manufacturing industry, it will be difficult to achieve China's industrialization and modernization. China's economy today is very different from what it was 40 years ago, and we have made great strides in many industrial fields. Reading this book will allow us to see the development of enterprises, to grasp the macroeconomic trends, and to think holistically about how to make the real economy stronger.

AIGC: The Era of Intelligent Creation

Author: Du Yu, Zhang Ziming
Publisher: China Translation and Publishing House

AIGC (Artificial Intelligence Generated Content) has become the hottest concept of the moment. In September 2022, AI painting became a hit; on November 30, ChatGPT was launched, officially showing the world how "powerful" AIGC is. The year 2023 will be a year when AIGC will team up with Web 3.0 and the metaverse to make a splash.

Stories of High-level Overseas Investment of Chinese Enterprises

Author: Xie Lincan
Publisher: Posts and Telecom Press

In the midst of deep globalization, how to make Shanghai Electric a globally competitive enterprise? This book summarizes the revenue logic of Chinese enterprises' overseas investment by pointing out the basic facts and historical trajectory of the development of overseas investment in four major fields, and proposes countermeasures to facilitate high-level overseas investment in the new era.

Accounting Transformation and Advancement

Author: Yuan Guohui
Publisher: Posts and Telecom Press

It's time to change the way you work and shift your mindset, and integrate financial thinking into your business with emphasis on financial forecasting. The book can help you complete the transformation from financial accounting to management accounting.

An overall introduction to the vitality reading club

Vitality reading club registration consultation


上海电气
SHANGHAI ELECTRIC
SHANGHAI ELECTRIC
CREATE OUR FUTURE TOGETHER