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printing Shanghai Baolian computer
printing Co., Ltd

2021. 10 NO. 35

Bilingual Bimonthly Journal

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

Free Material Only for Internal Use
Print the number of 2000

www.shanghai-electric.com



shanghai-electric



Shanghai Electric

OUR LIFE IN WHOSE HANDS FUTURE?

In a booth design completion for the China International Industry Fair, a candidate company embedded a little game that can calculate carbon emission in the booth. In this way, visitors could get a souvenir and knew their carbon footprints at their arrival at Shanghai Electric's booth after walking along the aisle. The introduction had us blown away by new technologies and trendy ideas. It reminded me of a game that was once popular. The game could estimate the carbon emission of our daily routines and those with lower emissions would receive awards of different grades. Although the game is rarely mentioned in recent years, I have become strongly aware of environmental protection due to campaigns like switching off lights for one hour, public transportation for one day and a vegan diet for one day.

The Central Economic Work Conference held in 2021 saw it a major task to peak its carbon emissions before 2030 and achieve carbon neutrality before 2060. What is carbon neutrality? It means that in 40 years, China is going to have a balance between emitting carbon and absorbing carbon. What if China fails to attain the goal? The only way out is to purchase emission quotas from countries with surplus credits.

Why is carbon emission regarded so essential? Environmentalists depict an array of dire scenes in the looming future due to increasing carbon emissions, such as global warming, sea level rising by 60 meters, polar bears drowning due to habitat loss, and millions of people dying from illnesses caused by air pollution, each of which is so horrible that everyone is thrown into sorrow or anger. As a matter of human survival, carbon neutrality has been included in laws by a dozen of countries.

What changes will happen in a future defined by carbon neutrality? Power consumed by the carbon-neutral community in the future must rest on zero-carbon electricity. According to the latest issue of the British magazine New Scientist, new energy, such as wind and solar power, will decarbonize urban power and land transportation systems.

Energy consumers move towards the sustainable direction along with power suppliers. In 2020, electricity accounted for about 27% of end-use energy consumption, which was increased from 19% 10 years ago and is estimated to rise to 39% in 2030 and 70% in 2060. On basis of supplying carbon-zero electricity at a faster speed, efforts shall be made to speed up re-electrification in fields of industry, construction and transportation, which is essential to increase the efficiency of energy use and achieve decarbonization of and carbon-zero energy consumption.

"Achieving goals of carbon peak and carbon neutrality" is an example of China's solid actions in performing sustainable responsibilities as a major country. Concerning the carbon neutrality-oriented energy reform, Chinese people recognize environmentally-friendly and low-carbon ideas and lifestyles, which are practiced by everyone every day. Take our daily diets in recent years for example, there are less meat but more vegetables and bean products.

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Shanghai Electric Ranked on Asia's 500 Most Influential Brands List For 6th Consecutive Year

The World Brand Lab held the 2021 Asia Brand Summit on September 23 in Shanghai, and released the "Asia's 500 Most Influential Brands of 2021" list. Shanghai Electric ranked 93 and for a 6th consecutive year in the list that annually evaluates enterprises from perspectives of market share, brand loyalty, Asian leadership and ESG (environmental, social and governance) scores. The World Brand Lab is an international research institution on brand value. Shanghai Electric shows its brand leadership in China and Asia by entering the list again.

Shanghai Electric Digital Technology Awarded Industrial Internet Innovative Enterprise

Recently, the 15th Telecommunications Industry List themed "Industrial Chain Coordination and Formulation" was released at the 2021 PT Expo China. Shanghai Electric Digital Technology Co., Ltd. ("Shanghai Electric Digital Technology" for short) was awarded "Industrial Internet Innovative Enterprise" and SEunicloud, Shanghai Electric's Industrial Internet platform, ranked 19 on the "Top 50 Industrial Internet Service Providers" list. With missions of "set benchmarks and improve quality & development", the Telecommunications Industry List has been released for 14 years in a row with third parties of the communication industry as evaluators, and is seen as an important industrial barometer.

Shanghai Electric Group's ESG Rating Upgraded

Recently, the Shanghai Electric Group's ESG (environmental, social and governance) rating was raised to BBB from BB by MSCI due to the group's continuous improvement and excellent performance in environmental, social and governance aspects. In particular, Shanghai Electric plays a leading role in 3 issues by industrial performance: opportunities of clean technology, hazardous emissions & wastes and labor management. It is reported that with social and environmental risks exacerbating, non-fiscal factors like ESG are playing a bigger role in assessing whether a listed company has enough potential for sustainable development. In the future, Shanghai Electric Group will place equal importance on disclosing internal ESG management and performance and following industry-leading and best practices worldwide to upgrade its ESG management quality.



BRIEF NEWS



Shanghai Electric Nuclear Power Group Partnered with SPIC For Technical Innovation

On August 20, Shanghai Electric Nuclear Power Group inked the joint R&D agreement on the project "Research, Development and Test of the Main Equipment Prototype of Spent-Fuel Dry Cask Storage System" with the Nuclear Industrial Innovation Center of State Power Investment Corporation Limited (SPIC). The spent-fuel dry cask is part of the National Energy Administration's nuclear technology upgrading project "Transport and Storage Casks for High Burn-Up Spent Fuel" that is led by Shanghai Nuclear Engineering Research and Design Institute and co-researched by the institute and Shanghai Electric Nuclear Power Group. The project is expected to expand the business of Shanghai Electric Nuclear Power Group to the downstream of the nuclear industrial chain, and in the meanwhile, fill gaps of spent-fuel dry cask storage technologies for Chinese generation-III passive nuclear power units.

Shanghai Electric's 23 Wind Farms Rated Excellent of 2020

Recently, Science and Technology Development Service Center and Wind Power Technology Association of China Electricity Council analyzed generation and operation performances of 2,488 wind farms in 2020 (data applied by 2,146 farms were effective) owned by 49 power group (investment) companies in China, and released the Notice of Operation Performance of Wind Power Industry in 2020. There were 23 wind farm projects of Shanghai Electric Wind Power Group Co., Ltd. ("Shanghai Electric Wind Power Group" for short) rated "excellent wind farms", 11 of which rated 5A (3 offshore farms and 8 onshore). In addition, Shanghai Electric Wind Power Group was awarded "Best Turbine Manufacturer by Unit Availability" in two offshore and 3 onshore areas.

Government Officials Witnessed Commercial Operation of Phase A of Phase V of Dubai Solar Park

Recently, the 900MW Phase V of Dubai solar park project has started commercial operation, Shanghai Electric Group as the EPC contractor. A number of Chinese and UAE government officials attended the ceremony and extended congratulations for it, who included Vice President and Prime Minister of the United Arab Emirates and Ruler of Dubai His Highness Sheikh Mohammed bin Rashid Al Maktoum, Deputy Ruler of Dubai Maktoum bin Mohammed bin Rashid Al Maktoum, and Consul General Li Xuhang of the Chinese Consulate General in Dubai. The project is located in the planned area of Phase V in the Mohammed bin Rashid Al Maktoum Solar Park, and divided into three blocks, A, B, and C, each representing 300MW. The project broke ground in July 2020 and passed the 10-day performance test on July 24, 2021, which allowed it to be commissioned earlier ahead of schedule.





Shanghai Electric's Sino Sindh Resources Obtained Environment Excellence Award of Pakistan

Recently, Sino Sindh Resources Private Limited, a subsidiary of Shanghai Electric, has been awarded the 18th Environment Excellence Award 2021 from the National Forum of Environment and Health held in Karachi, Pakistan, out of many international and local companies thanks to its remarkable performance in energy conservation, emission reduction and sustainable development. The forum themed "Ecosystem Restoration" is hosted by a national forum for environmental protection in collaboration with a social responsibility committee, supported by the Karachi Chamber of Commerce & Industry, and aims at increasing enterprises' awareness of sustainable development and encouraging them to lead the restoration of a green Earth.

Central Media Agencies Covered Shanghai Electric's 2 Overseas Projects During National Day Holiday

During the 2021 National Day Holiday, Xinhua Agency covered the Wassit Thermal Power Plant, constructed and operated by Shanghai Electric Group, in the video Chinese People Around the World Depict the Same Color Today shot for and broadcast in the program GLOBALink, extending the sincerest greetings to the birthday of our motherland.

In addition, the Phase V of Dubai solar park project, another project undertaken by Shanghai Electric, was reported in the interview titled "Best Wishes to China: "Belt and Road" Initiative Creates Opportunities and Interconnectivity Boosts Development" featured in a live news stream of CCTV (China Central Television), showing benefits of this project brought about to the implementation of the national strategy, local power consumption and local people's life in detail.



Power Plant in Sylhet in Operation, Shanghai Electric Participated

On September 12 (local time), the government of Bangladesh held an event for 5 power plants to start operation, the 225MW combined-cycle project in Sylhet included. Bangladesh Prime Minister Sheikh Hasina attended and delivered a speech online. Shanghai Electric was invited as the project's EPC contractor and service provider of the 2-year maintenance. The project was started in March 2018. Shanghai Electric's project implemented the temporary transfer in September 2020 despite difficulties in construction like limited areas, transportation of big equipment in dry seasons, conservation and restoration of sloping river banks and COVID-19 containment, ensuring that the guarantee period smoothly started as scheduled.



Shanghai Electric Environmental Protection Group Successfully Bid on Yulong Island Refining and Chemical Integration Project

Recently, Shanghai Electric Environmental Protection Group has been conferred on the Procurement-Construction contract of supplying integrated major equipment to the public project Yulong Island Refining and Chemical Integration. The project, coming as first on the major project list of Shandong Province 2020, costs over 127 billion yuan and includes the power center, raw coal transport and storage facilities, 6 high-temperature high-pressure pulverized coal boilers (planned), five 60MW extraction back-pressure gas turbines alongside with the supporting power supply and distribution system and 110kV booster station. Shanghai Electric Environmental Protection Group, the PC contractor, is responsible for supplying the three sets of major equipment and supporting power facilities.



Shanghai Electric Signed Another Contract on Electric Motors of China-Russia East-Route Natural Gas Pipeline Project

Recently, Shanghai Electric Machinery Co., Ltd. ("Shanghai Electric Machinery" for short) signed the agreement on supplying 5 sets of electric motors for the Anping-Taian section of the China-Russian East Route Natural Gas Pipeline Project (Yongqing-Shanghai) project with Xi'an Shaangu Power Co., Ltd., making new contributions to the "China-Russia Centenary Cooperation Project". Shanghai Electric Machinery, a veteran in the oil and gas pipeline market with hard powers of technology and delivery service, cements and enhances its leading advantages in the niche market of drive motors for long gas pipelines in China, which has it seen as a "stabilizer" for major transportation projects of Chinese natural gas infrastructure.

Thales SEC Transportation System Increased Metro Round-Trip Efficiency by 23%

Recently, Shanghai Transportation Trade Association and Shanghai Shentong Metro Group jointly held a presentation for the latest round-trip efficiency technology (RET) developed by Thales SEC Transportation System Co., Ltd. ("Thales SEC" for short), and together they witnessed the breakthrough of shortening the round-trip headway from 112s to 86s. The round-trip efficiency is commonly recognized as the biggest technological constraint. Leveraging its industry-leading TSTCBTC2.0@ signaling system for closed moving trains, Thales SEC follows the "track-resource-first" design philosophy, and develops innovative RET technologies for "station/area-integrated and closed moving" scenarios on its own, which can precisely control tracks and switches by evaluating both time and space factors and optimize the round-trip headway of multiple driverless trains and train routes. It is learned that this greener technology fills the gap in China in this regard and is likely to be applied in the metro industry to reduce energy consumed and emission in metro operation and contribute to achieving goals of carbon peak and carbon neutrality.



SHANGHAI ELECTRIC RISES TO No.51 in 2021 Top 250 International Contractors

On August 18 (local time), Engineering News-Record (ENR) announced the list of 2021 Top 250 International Contractors. Shanghai Electric ranked No.51 overall and No.4 in the category of state-owned power engineering enterprises.

The ENR list ranks global construction companies based on revenue generated by their overseas projects each year. For the ranking in 2021, Shanghai Electric reported 22 overseas projects in total. In particular, thanks to the Dubai CSP, Pakistan's Thar Block-1 Integrated Coal Mine and Power Project, Serbia's Pančevo Gas Turbine Project, and Vietnam's Forte PV Project, Shanghai Electric is honored to secure the highest rank in history and sees the biggest jump among its Chinese peers this year.

Amid the global outbreak of COVID-19 in 2020, Shanghai Electric overcame unprecedented pressure and spared all efforts to promote the progress of overseas projects, which leads to continued growth in the revenue from overseas projects. ENR reported that the new international contracts signed by the Top 250 companies in 2020 were worth USD 520.4 billion, a decrease of 17% from 2019; and the total international contracting revenue dropped 11.1% from 2019 to USD 420.4 billion. Among the 229 companies that have been on the list for two consecutive years in 2020 and 2021, 36.7% saw an increase in international turnover, and the rest 63.3% experienced a decline in performance.

This year, a total of 78 mainland Chinese companies made the list, and five of them are in the field of power engineering - they are, Power China, Energy China, SINOMACH, Shanghai Electric, and China Zhongyuan Engineering. Judging by region, Chinese companies have greatly expanded their market share in the Middle East to 34%, ranking first, with 5 companies including Shanghai Electric listed.

Engineering News-Record (ENR) is hailed as the most authoritative academic magazine in the global sector of engineering construction, and is affiliated to the US-based company McGraw-Hill. ENR provides the engineering and construction news, analysis, commentary and data. Its audience includes contractors, project owners, engineers, architects, government regulators and industry suppliers around the world. The rankings published by ENR enjoy world-class influence and are widely considered the industry barometer that demonstrates the development of the international engineering market each year. **D**





WORLD'S FIRST 1000MW “DOUBLE REHEAT + DOUBLE-TURBINE REGENERATION” STEAM TURBINE IN OPERATION

Not long ago, built by the Shanghai Electric Power Generation Equipment Co., Ltd. Turbine Plant, Unit 3 of the Huaneng Ruijin Power Plant Phase II 2×1000MW Project passed the 168-hour test run, in which units operated stably with all parameters in a normal range. The 2×1000MW unit project, the world's first application of the “double reheat + double-turbine regeneration” technology, began construction in 2019 and was designed to build two 1000MW ultra-supercritical double reheat coal-fired units by increasing the original capacity. After the project was completed, the total installed capacity of the power plant would grow to 2700MW with its annual power output reaching 13.5 billion KWh. The project comes as the first under the energy category of the Revitalization Plan of Jiangxi, Southern Fujian and Guangdong Province (The Former Central Soviet Areas) and is one of the major projects of Jiangxi Province. **D**



上海电气
SHANGHAI ELECTRIC



EXPO 2020 DUBAI UAE
CHINA PAVILION 中国馆

2020迪拜世博会中国馆官方合作伙伴
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ENERGY EQUIPMENT

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INDUSTRIAL EQUIPMENT

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EXPO 2020 DUBAI BEGAN ON OCTOBER 1ST AND SHANGHAI ELECTRIC IN THE CHINA PAVILION UNVEILED THE NAKED-EYE 3D “MEET THE FUTURE” JOURNEY

Expo 2020 Dubai Kicked off with a lavish opening ceremony on October 1st, 2021. The expo was themed “Connecting Minds, Creating the Future”, and Shanghai Electric was invited to attend as an official partner of the China Pavilion and a leading player in the international energy sector. The latest achievements in smart energy and intellectual manufacturing were displayed in the “Communication and Connection” exhibition in the China Pavilion, where visitors would have an immersive journey of “green future” via a video played on

a naked-eye 3D screen. Expo 2020 Dubai presents participants from 192 countries and is expected to welcome 25 million visitors, which aims to coordinate international community efforts, boost global cooperation and create a better future. China Pavilion, one of the largest of this expo, is themed “Build a Community with a Shared Future for Mankind – Innovation & Opportunity” that underscores development opportunities and collaboration possibilities created by the “Belt and Road” Initiative for countries taking part in the program and even all mankind and highlights the Chinese proposal promoting common development of all countries and building a community of a shared future for mankind. Shanghai Electric is to launch a



MEET THE FUTURE

Embracing the concept of "openness, synergy, cooperation and win-win", we will create the future with creators all over the world!

time journey to the future in the “Communication and Connection” exhibition in the China Pavilion. The one-take video played on a naked-eye 3D screen shows an array of imaginative application scenarios in a future city: world-leading solar power project co-built by Shanghai Electric and overseas companies alongside with green, sustainable, smart and interconnected industries like wind power, hydrogen power, energy storage, green traffic and Industrial Internet, depicting a low-carbon future thanks to “intelligent manufacturing at China”.

Shanghai Electric, an official partner and participant of the China Pavilion, stages smart energy and intelligent manufacturing solutions and products in line with the development path “technology-driven transformation and upgrade”, which moves towards the national goals of achieving carbon peak and carbon neutrality, calls for a dialogue with natural life and harmonious co-existence with the ecosystem, accelerates human progress and sustainable social development with global innovators, and promotes an “open, coordinated and mutually-beneficial” development landscape, boosting China’s charisma on the global stage.

In the 6-month expo, Shanghai Electric is going to launch the “Shanghai Electric Day” campaign in December at the China Pavilion to facilitate in-depth communication and collaboration with the UAE and other countries. By presenting clean energy solutions for wind and solar power as well as energy storage, Shanghai Electric displays its pioneering practices in building a sustainable society with global partners and endorses its mission “Empower Global Industry and Make Life Smarter”.



Shanghai Electric has completed a series of super projects in countries along Belt and Road for years, making it a known enterprise to domestic and international media. The Dubai 950MW CSP+PV solar complex broke ground in 2018 with Shanghai Electric as the EPC contractor, which is a landmark for Shanghai Electric in implementing the principle of extensive consultation, joint contribution and shared benefits under the “Belt and Road” Initiative and estimated to provide over 320,000 Dubai households with clean power per year by cutting carbon emission by about 1.6 million tons. Following the path formulated by the “Belt and Road” strategy, Shanghai Electric closes its ties with participating countries and enhances infrastructure construction for countries along the Belt and Road via sharing advanced technologies and project expertise. In the future, Shanghai Electric will reinforce its major businesses of technology empowerment and industrial innovation by pursuing high-end technological breakthroughs and cooperation, and build a community of shared future with all countries and a green future with “intellectual manufacturers” worldwide. 

NO. 1 IN ASIA! SHANGHAI ELECTRIC'S 11MW DIRECT- DRIVEN OFFSHORE WIND TURBINE ROLLED OFF PRODUCTION LINE

On September 28, Shanghai Electric Wind Power Group hosted the Zero Carbon Era Offshore Wind Power Forum and Petrel Platform Release Ceremony in Shantou, Guangdong Province and released its latest model Petrel platform SEW11.0-208. This model, a flagship offshore wind power turbine of Shanghai Electric, is by far the largest direct-driven offshore wind turbine in Asia, whose intellectual property is solely owned by Shanghai Electric, and marks a new breakthrough in China's independent innovation for offshore wind power and the start of the 10MW era. Wen Zhanbin, Secretary of the CPC Shantou Municipal Committee, Zeng Fengbao, Deputy Secretary and Mayor of Shantou, and Jin Xiaolong, Vice President of Shanghai Electric Group, Party Secretary, and Chairman of Shanghai Electric Wind Power Group, attended the event.

Petrel (meaning Haiyan in Chinese) is a platform independently developed by Shanghai Electric for the always-changing and complicated marine environment characterized by high temperature, high humidity, high salinity, typhoons and earthquakes. The SEW11.0-208 offshore wind turbine is the first product based on this platform. Driven by goals of achieving carbon peak and carbon neutrality, Shanghai Electric develops this highly cost-effective direct-driven platform that can work in seas in normal weather and typhoons concerning the high offshore wind speed and wind power parity, and increase power generation efficiency while ensuring excellent synergy and a low failure rate. The turbine adopts the

concept of life cycle in digital design, production and maintenance management, and reduces operational load and enhances operation stability thanks to the application of Shanghai Electric's latest version of the LeapX control system. By employing the world-leading pneumatic blade design technologies, Shanghai Electric brings the carbon fiber blade S102 with excellent performance. The SEW11.0-208, a highly smart wind turbine, is connected with Shanghai Electric's smart Fengyun System, which will make it more useful and increase client's benefits continuously. Shanghai Electric, one of the top players in the Chinese wind power industry, especially offshore wind power, will invest more in carbon neutrality technologies, and empower technological innovation and comprehensively build an advanced carbon-zero technology framework via new technologies and ideas including big data, cloud computing, Internet of Things, artificial intelligence and 5G. At the same time, Shanghai Electric will leverage Shantou Offshore Wind Power Industry Alliance to boost the building of the local industrial chain, industrial synergetic development and the new energy industrial ecology. After building the first carbon-zero factory, Shanghai Electric will move forward on the path of new technologies, models and industries for comprehensive and smart energy services towards the goal of "new energy + industries" coordinated development represented by carbon-zero factories, parks, and cities, supporting China to achieve carbon neutrality at an early date. **D**

SHANGHAI ELECTRIC BREAKS THREE RECORDS OF WIND TURBINE BLADE LENGTH

Shanghai Electric Wind Power Group Co., Ltd. declared the rollout of its independently-developed wind turbine blade S102 - also the longest in China - and onshore blade S89, following the world's longest wind turbine blade of glass fiber S90 produced on February 6. This means that the Wind Power Group has broken three records for the length of wind turbine blades at home and abroad within just half a year and more.

The 102-meter-long S102 blade is designed to GL2015 and IEC61400-5 standards and can withstand the strength of category-1 typhoons. The successful production of this blade means that Shanghai Electric Wind Power Group masters technologies of the 100-meter blade. Cutting-edge technologies employed in the R&D stage remarkably ensure and improve the blade's performance efficiency and stability, illustrating Shanghai Electric Wind Power Group's technological strength. The blade follows the airfoil family characterized by a high lift-drag ratio / low roughness and sensitivity which ensures the power generation efficiency and minimizes environmental footprints from the very start. The platform-based design enhanced by integration uses Shanghai Electric's own digital technologies to reach the optimal balance between turbine efficiency and load. Paying enormous attention to the blade's dynamic deformation in the design stage, Shanghai Electric uses bending-torsion coupling that enables dynamic iteration of the blade's aerodynamic performance and structure to ensure the high stability of power output and load. All-rounded security corrections are exercised on blades according to the latest international standards. Structural innovations minimize the blade weight, optimizing the overall cost and reliability. The carbon fiber employed in design reduces both the blade weight and load while increases power generated thanks to its advantageous properties like high specific modulus and specific strength. It lays a good foundation for efficient mass production by adopting production-oriented modular design and interface integration methods. Guided by "DFX way" engineering principles, Shanghai Electric Wind Power Group takes every link of the life cycle into consideration including manufacturing, transportation, installation and

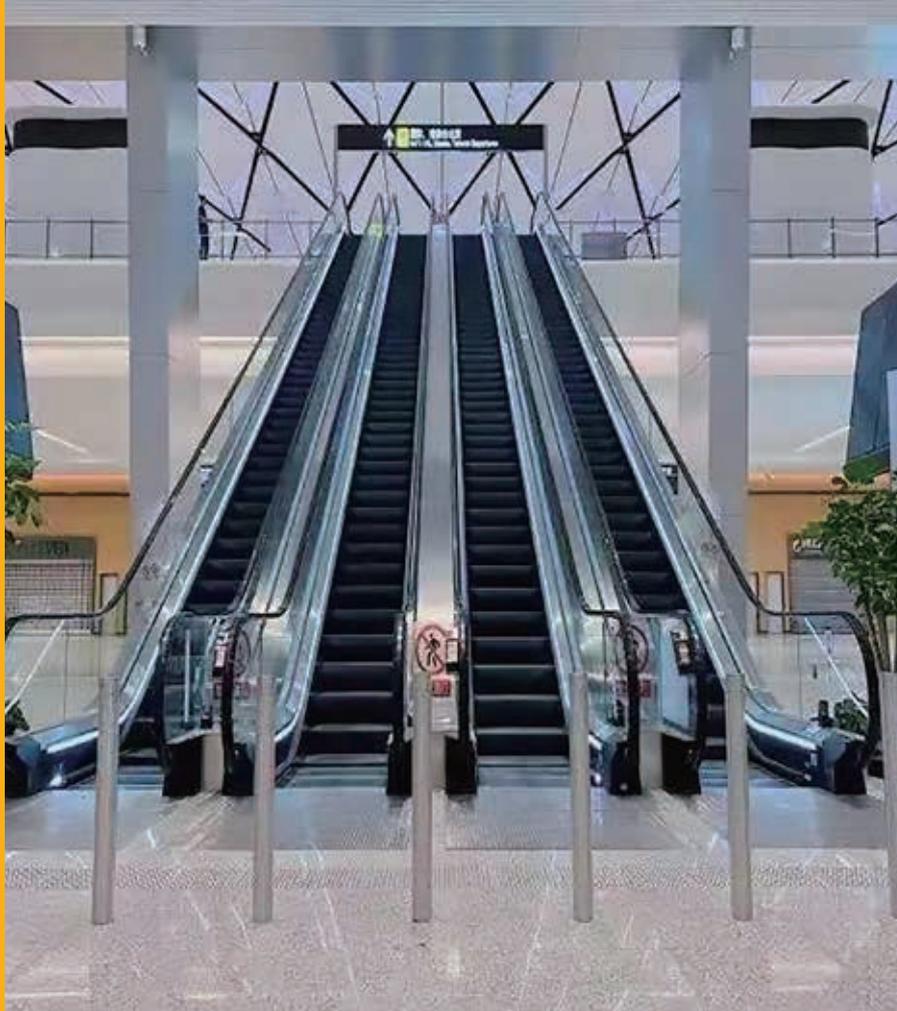
maintenance to present this world-leading wind power turbine blade.

The 89-meter-long S89 blade is the longest onshore blade in the world so far, which will be applied in the latest platform-based turbine generator released by Shanghai Electric Wind Power Group. Its successful production indicates 18X wind rotors are available for onshore wind turbines. By employing digital design technologies, the blade is able to automatically iterate and improve its shape and load, further enhancing the power generation efficiency and safety.

The S90 blade independently developed by Shanghai Electric Wind Power Group for the offshore wind turbine passed the full-length static strength test in one trial early this year. In addition to refreshing the blade test record in China, the 90-meter-long blade was the longest glass fiber blade of wind turbines worldwide at that time.

Driven by technological innovation, the blade design team of Shanghai Electric Wind Power Group develops highly competitive blades to make industrial chain costs of blades lower and lower, building up more cost-based advantages through leading technologies due to changes and innovations. As a leader of offshore wind turbine manufacturers in China, Shanghai Electric Wind Power Group tracks the market trend closely and spares no efforts in R&D to enhance its technological strength, continue to explore low-cost blade solutions and lead the future trend in the large offshore wind power equipment market.

Shanghai Electric Wind Power Group is committed to this great energy reform and strives to fulfill the significant mission of this era via technological innovation, making contributions to achieving carbon peak by 2030 and carbon neutrality by 2060. **D**



SHANGHAI MITSUBISHI ELEVATOR BACKS SHANGHAI ASTRONOMY MUSEUM AND TWO BIG AIRPORTS IN CHINA

Shanghai Astronomy Museum, the largest of its kind by size in the world, has unveiled its curtain. Shanghai Mitsubishi Elevator Co., Ltd. ("Shanghai Mitsubishi Elevator" for short) serves as the sole elevator supplier who was responsible for 10 passenger elevators, passenger-and-freight elevators, machine-room-less freight elevators with a high load capacity and escalators. Shanghai Mitsubishi Elevator provides customized products to go with the architectural design by combining advanced technologies with thoughtful services, allowing visitors to enjoy a smooth journey.

The Chengdu Tianfu International Airport project and the terminal renovation and expansion project of the Lhasa Gonggar Airport - both undertaken by Shanghai Mitsubishi - have recently been completed and started operation.

Chengdu Tianfu International Airport, as China's largest civil transportation hub project under the national 13th Five-Year Plan, has been equipped with 226 escalators of the Shanghai Mitsubishi Elevator. And Lhasa Gonggar Airport is one of the airports in the world with the highest altitude, as well as the only airport in Tibet that operates international flights. The project has used a total of 49 escalators from Shanghai Mitsubishi Elevator.

The time gap between the two airports' commencement was only half a year. In addition, elevator and escalator installation in airports is often challenged by the large number of equipment, tight construction schedule, and frequent cross-operations. Due to the pandemic in 2020, the Tianfu Airport project was suspended at the request of the municipal government until the end of March, but the predetermined completion and opening timeline was not extended accordingly. **D**

SHANGHAI ELECTRIC-SPX RECEIVED ORDER OF DIRECT AIR-COOLING EQUIPMENT FROM SOUTH AFRICA REDSTONE PROJECT

Recently, Shanghai Electric-SPX Engineering & Technology Co., Ltd. ("Shanghai Electric-SPX" for short) received a Pre-notice to A Successful Tenderer in the bid for the EPC contractor of Redstone's direct air-cooling equipment, a project in South Africa. The Redstone project located in the Northern Cape Province, is so far the country's largest renewable energy project, and the first Concentrated Solar Power (CSP) molten salt tower in Africa with ACWA Power as the developer and SEPCOIII Electric Power Construction as the EPC contractor. By winning this tender, Shanghai Electric-SPX makes an important step forward in the business transformation towards new industries and enhancing its global influence. **D**



COVER TOPICS



WELCOME TO THE ZERO-CARBON ERA





To achieve goals of carbon peak and carbon neutrality as scheduled, the Communist Party of China (CPC) Central Committee and the State Council jointly announced the Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy (hereinafter referred to as “the Guidance”) on October 24. The Guidance, the “1” of the “1+N” policy framework, provides a systematic action plan for achieving carbon peaking and carbon neutrality targets and is also a general deployment. All industries, local governments and enterprises are implementing measures to this end, and the clean transformation of the energy sector plays a pivotal role. China’s low-carbon transformation of the energy industry from the coal-centric energy consumption structure is hugely impacted by the effective formation of a new power system mainly backed by new energy and addressing problems impeding the transformation.



SHANGHAI ELECTRIC LEVERAGES MULTIPLICATION EFFECT IN NEW ENERGY DEVELOPMENT BY PROMOTING WIND, SOLAR, STORAGE AND HYDROGEN IN PARALLEL

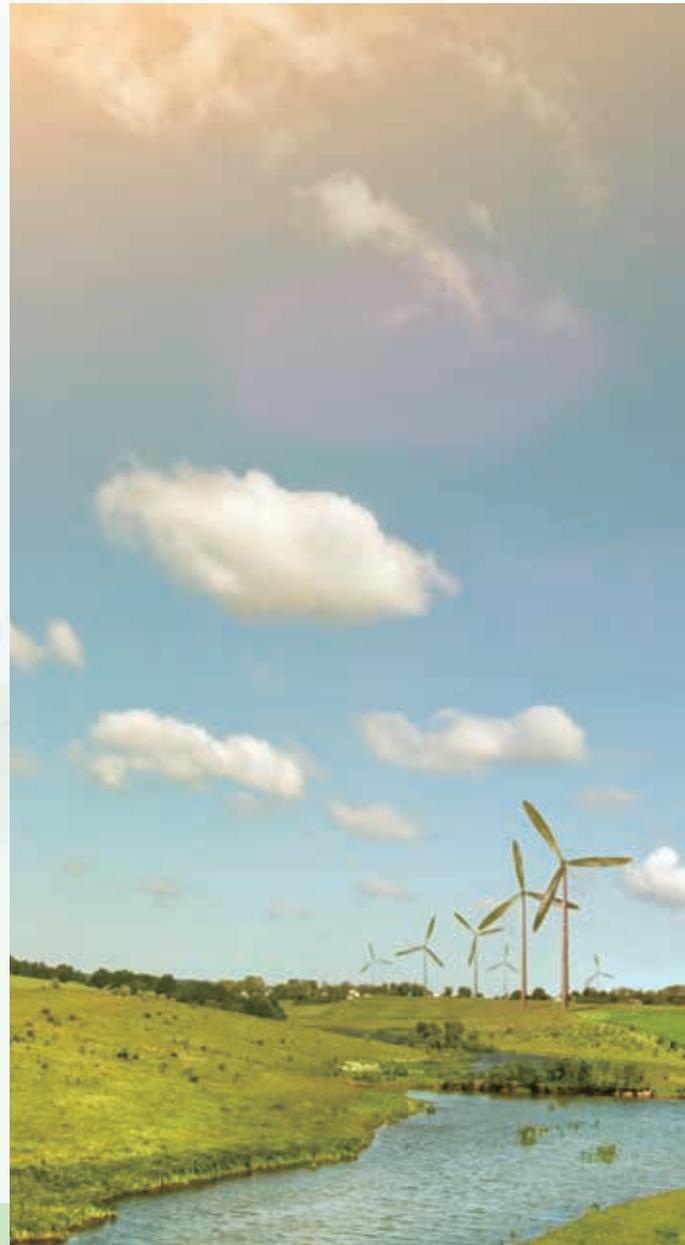
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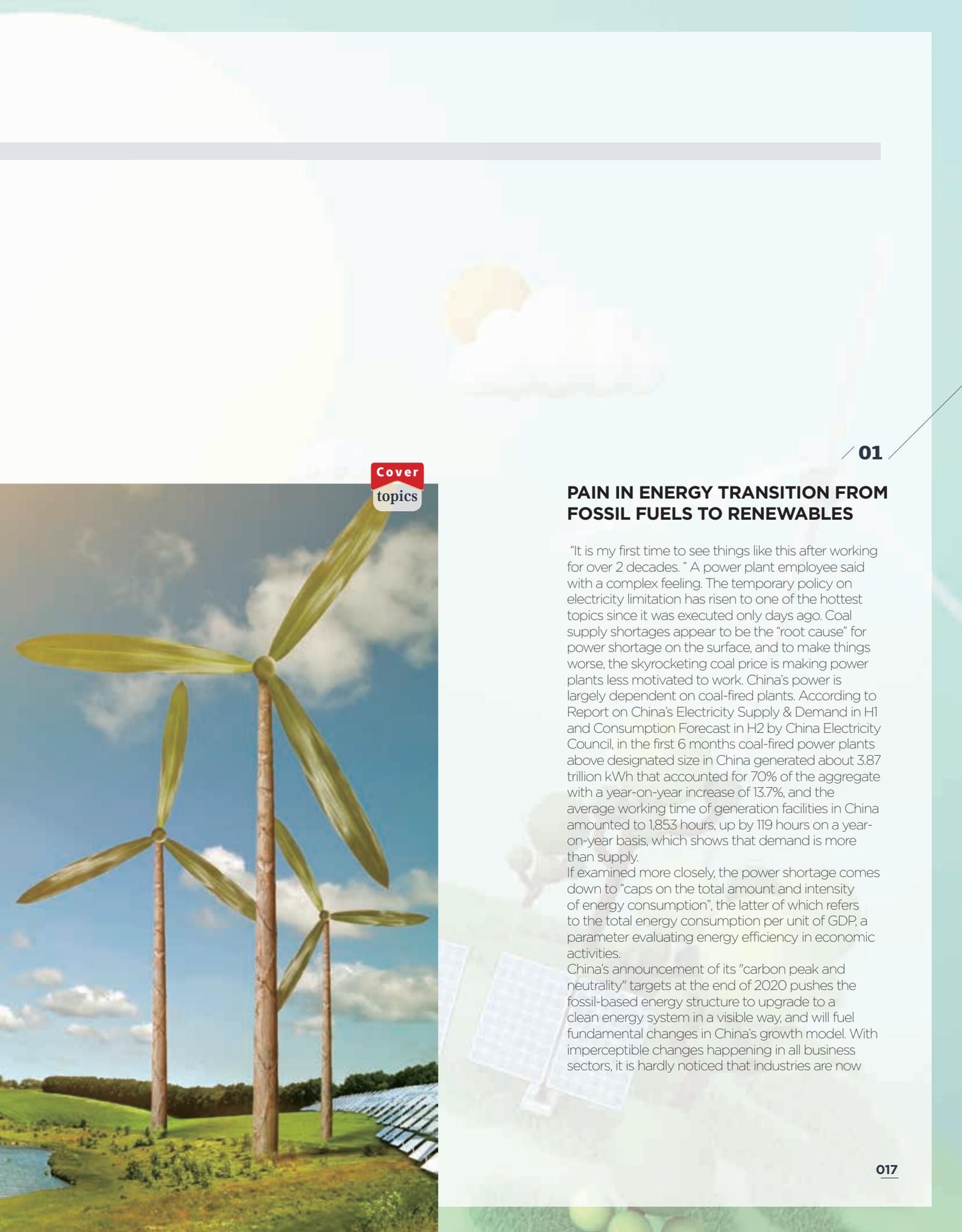
ith the strictest power cuts in recent years put in place, the term “electricity shortage” has bombarded the press alongside the fundamental transformation and upgrading of energy consumption

structure, as well as industrial and economic structures.

According to Li Qionghui, President of Institute of New Energy and Statistics, State Grid Energy Research Institute, China’s energy industry is facing new opportunities amid the 14th-Five-Year-Plan period: the new energy sector will explode with new characteristics, which will double the average annual capacity newly commissioned in China compared with that of the 13th-Five-Year-Plan period; distributed generation, micro-grid and integrated energy system will contribute to the fast growth of the size of the new energy market; energy storage will enter the fast lane because a higher proportion of new energy will lead to a sharp increase in the need for tools of flexible adjustment; and new energy will be mainly consumed by market entities.

Driven by political incentives and visionary planning by the group, Shanghai Electric has pressed ahead the new energy industry including wind power, PV, energy storage and hydrogen. To accelerate the development of “wind-solar-hydrogen-storage hybrid system”, it has launched a couple of new energy bases to leverage the multiplication effect of various kinds of new energy and to support the achievement of carbon peaking and carbon neutrality in related fields.





Cover
topics

PAIN IN ENERGY TRANSITION FROM FOSSIL FUELS TO RENEWABLES

"It is my first time to see things like this after working for over 2 decades." A power plant employee said with a complex feeling. The temporary policy on electricity limitation has risen to one of the hottest topics since it was executed only days ago. Coal supply shortages appear to be the "root cause" for power shortage on the surface, and to make things worse, the skyrocketing coal price is making power plants less motivated to work. China's power is largely dependent on coal-fired plants. According to Report on China's Electricity Supply & Demand in H1 and Consumption Forecast in H2 by China Electricity Council, in the first 6 months coal-fired power plants above designated size in China generated about 3.87 trillion kWh that accounted for 70% of the aggregate with a year-on-year increase of 13.7%, and the average working time of generation facilities in China amounted to 1,853 hours, up by 119 hours on a year-on-year basis, which shows that demand is more than supply.

If examined more closely, the power shortage comes down to "caps on the total amount and intensity of energy consumption", the latter of which refers to the total energy consumption per unit of GDP, a parameter evaluating energy efficiency in economic activities.

China's announcement of its "carbon peak and neutrality" targets at the end of 2020 pushes the fossil-based energy structure to upgrade to a clean energy system in a visible way, and will fuel fundamental changes in China's growth model. With imperceptible changes happening in all business sectors, it is hardly noticed that industries are now



subject to development and resource constraints. Goals of carbon peak and neutrality accelerate the development of new energy and phase-out of coal capacity to forge a new power system mainly backed by new energy, one of its goals. By the end of March 2021, China's total installed capacity of coal power plants stood at 1.09 billion KW, accounting for less than half of the national aggregate for the first time since the end of 2020. China Electricity Council has estimated that at the end of 2021, the total capacity commissioned from non-fossil sources including hydropower and nuclear power will grow to 1.12 billion KW whose proportion, 47.3%, is likely to outnumber that of coal-generated electricity for the first time.

To balance decarbonization and development, the National Development and Reform Commission issued the Dual Control System of Total Energy Consumption and Energy Intensity on September 16, which makes the control on total consumption more flexible and encourages renewable energy consumption rather than simply limiting the use of all kinds of energy.

02

WIND AND SOLAR POWER ENGULF THE NEW ENERGY MARKET

Shanghai Electric sees wind power as its crucial tool for peaking carbon and attaining carbon neutrality. On September 28, Shanghai Electric Wind Power Group ("Shanghai Electric Wind Power") celebrated a landmark occasion - "Zero-Carbon Era" Offshore Wind Power Forum and Petrel Platform Launch Ceremony - at Shantou City, Guangdong Province.





Shanghai Electric Wind Power announced to release its latest SEW11.0-208 model, the first wind turbine of the Petrel platform. As the largest directly-driven offshore wind turbine in Asia, it is independently developed by Shanghai Electric Wind Power, and embodies a big breakthrough in China's innovative development of wind power and manufacturing capability of building turbines of a capacity higher than 10MW.

It is of great importance to achieve decarbonization by developing green and low-carbon energy, especially offshore wind power. Shanghai Electric had created a milestone in China's offshore wind power market in 2020: China's first 8MW offshore wind turbine deployed at Shanghai Electric Wind Power's base in Shantou completed the "black start" successfully.

What's more, the Shantou Base was awarded a carbon-neutral certificate in a ceremony held in Beijing on October 19, which was the second for manufacturers in China and the first in Guangdong Province. The Shantou Base is Guangdong's largest smart energy project with a total investment of 240 million yuan, and also the first wind-solar-storage-charging-intelligence hybrid "Energy Internet +" demonstration industrial park of Shanghai Electric Wind Power. Enormous power is generated through the wind power system and PV facilities

commissioned on all rooftops in the park and consumed efficiently. By implementing a holistic solution based on smart park and smart energy, the project satisfies users' demand for power quantity and quality with intelligent tools, and raises the percentage of renewable energy and energy management efficiency.

Greenhouse emissions (in carbon dioxide (CO₂) equivalent) produced in manufacturing and operation processes will be 100% neutralized via alternative energy facilities including 8MW+4MW smart wind turbines, 2.4MW PV panels on rooftops and 2MW/MWh energy storage batteries. In June 2020, it successfully completed the "black start" of an 8MW wind turbine for the first time in the world, pushing the boundary of new energy much further in China. The "black-start" technology refers to supplying wind turbines with power generated by PV and energy storage systems of the smart energy project instead of power transmitted by the grid to increase the voltage from zero and have the turbine start.

Shanghai Electric Wind Power utilizes Shantou's abundant wind and solar resources to develop the largest integrated energy system in China so far, which is empowered by Artificial Intelligence, 5G and other smart technologies and embodies a series of devices including distributed wind turbines and PV



panels, new-type energy storage facilities, charging piles, smart building monitors, micro-grid controllers and energy management platform.

It is reported that the average annual effective working time of wind turbines in the Shantou Base is more than 3,000 hours, making it a category-I offshore wind farm. Wind turbines with a total capacity of 35.35 million kilowatts are planned to be installed in shallow-water and deep-water coastal areas, which are expected to generate more than 50 million kilowatts to be utilized in the long run.

Only good nests can attract phoenixes, and Shantou Base arouses the attention of both upstream and downstream players. Shanghai Electric took the lead to establish Shantou Offshore Wind Power Industry Alliance in 2019 that has had 42 enterprise members so far. It speeds up the high-quality development of Shantou Base by attracting 12 projects with a total

investment of 5.4 billion yuan.

"The reason why we decide to invest in Shantou Base is that the base provides supportive conditions for investments and business operation, and is bestowed with huge potential and a promising future due to the smart energy project." Sun Guodong, Vice Manager General of Qingdao Wuxiao (Shantou) Company, said. Qingdao Wuxiao plans to invest 2 billion yuan to build a big ocean engineering equipment manufacturer in 3 phases, which support functions of R&D, manufacturing and maintenance services.

The new energy industry is shifted to the fast lane by the momentum to achieve goals of carbon peak and neutrality. Wind turbines and PV facilities are installed most and main power providers. In 2018, Shanghai Electric won the tender for the EPC Contractor of the Dubai 700MW CSP + 250MW



Hybrid PV Project, expanding its business landscape to the Gulf region. Two years later, Shanghai Electric moved another big step forward by succeeding in bidding for the Dubai 900MW PV Project that will provide green energy to hundreds of thousands of local households and support Dubai to fulfill its 2050 energy strategy. The project will also amplify Shanghai Electric's influence as a benchmark. According to statistics, Shanghai Electric's total installed PV capacity connected to the grid in 2019 exceeded 2GW, which was equivalent to the top 3 EPC contractors for PV power stations in the US. Success is not a matter of luck. Shanghai Electric has started to enhance its presence in clean energy more than a decade ago, and laid a solid foundation for the fast development of solar energy by strengthening R&D into photo-thermal and PV technologies.

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HYDROGEN POWER: A NEW OPPORTUNITY OF NEW ENERGY

The Guidance requires to advance the development of the entire hydrogen value chain of "production-storage-transportation-utilization" in a coordinated way, and reinforce R&D, demonstration and large-scale application of key technologies on hydrogen production, storage and application, which again brings hydrogen under the spotlight.

Shanghai Electric Power Generation Group's Hydrogen Power Technology Center and Postdoctoral Research Center, founded in May 2021, is an important move taken by the group to implement the national strategy for developing hydrogen energy and facilitating industrial transformation and upgrading.

The 14th-Five-Year-Plan period is essential for the fast development of hydrogen power. Globally speaking, more than 30 countries have announced national hydrogen strategies and 228 projects in this regard as of February 2021, 55% of which are in Europe and 20% in Asia. With more and more investors coming to the hydrogen sector, it is estimated that by 2030, the total investment in the hydrogen-related project worldwide will exceed 2 trillion yuan.

While cementing its leading position in traditional businesses, Shanghai Electric has taken proactive actions to enter this emerging market. Shanghai Electric's independently-developed 66KW fuel cell passed the mandatory test by the National Center of Supervision and Inspection on Motor Vehicle Products Quality (Shanghai) (also known as Shanghai Motor Vehicle Inspection Certification & Tech Innovation Center Co., Ltd., or SMVIC) in 2020, and vehicles powered by this cell used in cold chain logistic distribution has completed whole-vehicle debugging, making the product ready for commercial application.



SIMULTANEOUS DEVELOPMENT OF “NEW ENERGY + ENERGY STORAGE”

With properties of high energy intensity, convenient fuel loading and a long driving range, the hydrogen fuel cell is a good choice for long-distance commercial vehicles with heavy loads and industrial parks in a huge need for logistic services, and possibly an equivalent of battery electric vehicles in the future. According to China Hydrogen Alliance, hydrogen-powered vehicles will take up 40% of all transportation vehicles by 2050.

At the same time, the overseas new energy market is moving towards the “wind + solar + storage + seawater desalination+ hydrogen production via electrolysis + nitrogen production via air separation + synthetic ammonia” hybrid application scenarios. According to China Hydrogen Energy and Fuel Cell Innovation Alliance, China’s need for hydrogen will increase to about 130 million tons every year in the backdrop of attaining carbon neutrality by 2060. Shanghai Electric promotes “wind-solar-hydrogen-storage” hybrid projects in order to lead the smart energy industry as a world-class player.

To build the “source-grid-load-storage-hydrogen” industrial ecology, Shanghai Electric plans to develop the “wind-solar-storage-charging-hydrogen” hybrid smart energy project, at Minhang Industrial Park, which is a demonstration application of “power generation from renewable energy + hydrogen production via electrolysis + hydrogen storage + power generation from distributed fuel cells”. In addition, Shanghai Electric designs the new model “power generation + chemical engineering” for traditional power plants, and builds demonstration projects of “coal-fired peaking plants + thermal energy utilization + PV power generation + hydrogen production via electrolysis + carbon dioxide capture + green chemical engineering” to realize efficient integration of new energy and low-carbon fossil energy. Following the path of hydrogen technology, Shanghai Electric is pressing ahead with a number of exemplary integrated green hydrogen projects that can lead the industry by leveraging advanced hydrogen-value-chain-based technologies.

As more power is generated from wind, solar and hydrogen sources, it is necessary to coordinate energy storage and peaking power to ensure the smooth operation of the power system. Wind, PV and hydrogen power alongside energy storage is forming a new power structure as new energy sources.

As for energy storage, Shanghai Electric enters the four areas of lithium batteries, flow cells, fuel cells and retired batteries step by step to enhance battery, motor and electronic control systems. Shanghai Electric launched the first commercial energy storage station, using lithium batteries, that supports energy sharing on the grid side in China, a significant move in exploring commercial models of energy storage, and has strengthened its ties with the lithium battery industrial chain by acquiring Yinghe Technology (a company that is mainly engaged in manufacturing lithium electric equipment). Shanghai Electric has released a megawatt-level all-vanadium redox flow battery that enables distributed or centralized peaking and frequency modulation. As for fuel cells, Shanghai Electric focuses on electric pile and membrane electrode technologies and products, and has released the first-gen 30KW fuel cell engine with the automobile announcement made. As a leader in China’s retired battery market, Shanghai Electric has completed more than 10 demonstration projects.

The “wind-solar-storage-charging-control” hybrid smart energy project co-developed by Shanghai Electric and State Grid Shanghai Municipal Electric Power Company in Minhang Industrial Park has been the biggest exemplary integrated energy project in Shanghai so far. With Shanghai Electric’s advantages in equipment manufacturing, it efficiently synergizes the CIGS thin-film PV, crystalline silicon PV, wind power generation, LFP containerized energy storage system, power battery cascade utilization and charging piles to manage the park’s energy consumption in a smart and uniformed way, cutting the power use by 2158MWh every year. The smooth operation of this project proves the commercial feasibility of the smart energy model for industrial parks, making it a new benchmark for parks pursuing energy conservation and low-carbon transformation in the future. The 1MW/1MWh energy storage station



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independently developed by Shanghai Electric Energy Storage Technology Co., Ltd. with lithium battery technologies has passed tests at the Shantou Base, guaranteeing the successful operation of the above-mentioned “wind-solar-load-storage” hybrid smart energy demonstration project launched by Shanghai Electric.

By entering wind power, PV, hydrogen power and energy storage sectors, Shanghai Electric has forged its own new energy landscape and formulated a clear strategic map. The “new energy + energy storage” model has been adopted by various kinds of energy storage projects: 100MW/200MWh Jinzhai energy storage project on the grid side, Guangdong Yudean Dapu Power Plant’s energy storage and frequency modulation project on the plant side, and the first commercial “Internet +” smart energy demonstration project at Minhang Industrial Park on the user side. In addition, the first energy storage station that supports power sharing in China has started operation, which is built by Shanghai Electric at Golmud City, Qinghai Province.

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. Shanghai Electric recognizes that technology is the most important variable and biggest driver in transformation, and hence is committed to key technologies in areas of new energy, energy storage and CCUS to shift to new growth drivers faster, optimize industrial structure and realize high-quality development.

The Guidance clarifies that by 2030, China will see significant accomplishments from the comprehensive green transformation in economic and social development, and the share of non-fossil energy consumption will have reached around 25% with the total installed capacity of wind power and solar power reaching over 1200 gigawatts. By 2060, China will have fully established a green, low-carbon and circular economy and a clean, low-carbon, safe and efficient energy system. Energy efficiency will be at the advanced international level, and the share of non-fossil energy consumption will be over 80%. China will be carbon neutral, and it will have achieved fruitful results in ecological civilization and have reached a new level of harmony between humanity and nature. Big opportunities and challenges await energy giants, and Shanghai Electric is determined to fulfill its responsibilities.



ZHAO JINLIANG:

**PURSUE HIS
DREAM FREELY
IN SHANGHAI
ELECTRIC,
SUPPORTED
BY EXPERTISE
AND NAVIGATED
BY ORIGINAL
ASPIRATION**

Z

Zhao Jinliang has long wanted to be an engineer from a very young age. After he was enrolled in the technology center of Shanghai Electric Power Transmission & Distribution Group in 2008, he won a series of awards from 2013 to 2015 alone: Second Prize of Shanghai Electric Major Technological Innovation Award, First Prize of Shanghai Electric Science and Technology Progress Award, and Second Prize of Shanghai Municipal Science and Technology Progress Award. In 2020, he was honored by the title "Shanghai Model Worker".



ZHAO JINLIANG

"Kind" and "eloquent" are two keywords of how people think of him in the first meeting. The interview went on while different people came to him for help. His professional and calm working style backed up by rich experience was highly impressive. Clients think of him as capable, reliable and efficient; managers see him as diligent, humble, patient and detail-oriented; colleagues consider him ambitious and highly skillful. "I wanted to be an engineer who was fully devoted to research work on my own." However, in the course of developing the wind turbine's pitch system, he rotated among different kinds of engineers: electric, simulation algorithm, software, structure, test, to name just a few. He found "another self" thanks to these experiences: one who loves communicating with others and management. In October 2020, Zhao Jinliang was appointed as the Vice General Manager of Shanghai Electric Power Electronics Co., Ltd. "I can feel the changes in the way I think, which will make my work better-organized with a clearer target." He has had difficult and great times throughout these years, and experienced the whole-hearted devotion to product development as a researcher and the trade-off dilemma between an ideal product and a profitable one with good user experiences as a manager.

SET YOUR LIFE GOAL EARLY

"I constantly reflect on my past days which can be divided into 3 stages: study for life, study for interests and study for self-worth."

Zhao Jinliang was born in Suiling County, Heilongjiang Province, in 1984. "My hometown has a total population of 60,000 only, and is quite small. It takes only 15 minutes to ride a bicycle from south to north and about 40 minutes from east to west." Zhao Jinliang said gently, recalling days in the little town.

With little idea of the importance of study, he was a low-performing student at the elementary school, and this situation changed when his uncle became a senior engineer at Beiqi Foton Motor Company after graduation. "My uncle graduated from Harbin University of Science and Technology as one of the handful undergraduates in my hometown, so all my family members believed that he would be somebody." Zhao Jinliang sees his uncle as the pivot in his life.

At junior high school, he noticed that classmates with poor performances became manual workers even if they were still teenagers. A teenage student from a small town could hardly find another way out except being admitted by a university in the 1990s. Following his uncle's step, Zhao Jinliang also wanted to be an engineer. Thanks to hard efforts, he "miraculously" improved his academic performance by grade 2 of junior high school, and ranked first in physics and chemistry. A dream doesn't become reality naturally, and to set a goal early only embarks on your life journey. How to stay committed to the original aspiration remain important to all stages of life.



"Interests drove me to study in my high school. I spent a lot of time on physics, even during walking or having meals, because I wanted to figure out which formula to use for the question and why to use it. I would go into the fundamental meaning of every concept included in the question." With excellent performances in math, physics and chemistry due to his interests in the high school, he managed to be admitted to Harbin Institute of Technology (HIT).

Zhao Jinliang was deeply shocked by the 2 big banners hung on the dormitory for masters into which he moved from undergraduate housing, which read "Scientists of the future, welcome". "It felt so good when I realized that I could be a scientist." He was not blown away but recognized that he still had a long way to go. From then on, he entered the third stage: study for self-worth. "HIT is renowned as 'the cradle of engineers' with the schooling style 'Being strict in qualifications for graduates and making every endeavor in educating students'." It possibly explains Zhao Jinliang's carefulness at work and in life.

STRIVE TO BE THE BEST

In 2008, Manager Dong who was responsible for recruitment thought that Zhao "is able to think logically with excellent expertise, and his major is precisely what we need." From Zhao Jinliang's perspective, "a good match between his major and the vacancy is quite alluring, and a clear work target is also what he likes."

In early 2010, he took part in the R&D of a wind turbine's pitch system. What is a pitch system? It is used to move the blade to a required angle in a real-time manner to make sure the maximum power point tracking. To put it simply, it can adjust the blade for the best windward angle in case of low wind speeds, and vice versa. - The pitch controller plays a fundamental role in the safe operation of wind turbines, which accounts for a large number of wind turbine towers' collapses worldwide. - Therefore, the system is highly risky and a tiny mistake could lead to severe accidents. Zhao Jinliang came to the lab in Qingpu District to finish type tests of the pitch controller, which was remote from the downtown with no accommodation or restaurants around. - He had to sleep at the lab that was equipped with only two sofas, an old-type air conditioner and a small table during high-temperature, low-temperature and damp heat tests because they often lasted for days. - "I spent Christmas Day and New Year here. Luckily I was single then." He joked about the past. During that period of time, instant noodles were the only choice on his diet, and he could only occasionally have a better meal when colleagues came. His efforts paid off after more than 6 months' testing. "I was under big pressure because it was a product of strategic importance. The company invested considerable resources into it, and myself huge support and trust."

Zhao Jinliang developed the pitch system prototype, and proceeded with the operation, debugging and improvement. "I went back home after 7 or 8 pm every day, which was a familiar routine for me since my postgraduate days." Zhao Jinliang carried on the practice even after he joined Shanghai Electric. "When I was a postgraduate, the schedule was "816"



ZHAO JINLIANG

rather than “996” (to work from 9:00 AM to 9:00 PM, six days a week), which meant to work from 8:00 am to 11:00 pm at the lab for 6 days a week.”

It came all out of a sudden that the company decided to put this pitch system into mass production. Zhao Jinliang was shocked because “if our competitor got the order, then what we missed was not only the order itself, but possibly the opportunity to enter the market.” It was much more difficult than expected when it came to production, and even worse, every link involved had no time to prepare for it. Zhao Jinliang had thought that the mass production would not be started before the prototype ran for at least one year and passed all related

tests. “But the order was there, and neither the company nor myself wanted to miss it.” Zhao Jinliang spent over 3 months at the production workshop to make mass production practicable as fast as he could. His daily work included nearly 100 phone calls, explanations to dozens of colleagues and various assignments like facilitating supply chain building, designing test platforms, training employees, and formulating procedure files, test guidelines, service manuals and production instructions. “Amid that period of time, I had to run to the bathroom or have some water.” After coming back home, he reviewed every implementation problem occurring in the day and sent revised documents to departments accordingly so that correction could be put in place early in the next day. As the delivery date was around the corner, the first batch of 5 pitch systems rolled off the production line, a final round of debugging to be done. - At midnight, packaging staff and transportation trucks waited at the gate of the factory. Standing outside the workshop, the General Manager could hardly resist the temptation to go inside and ask how things were going, but he didn't and waited farther away while paying close attention to Zhao's work because he



knew that it was definitely better not to make Zhao more nervous at this crucial point. Zhao Jinliang finished the debugging of all 5 pitch systems at 3:00 am, and did an additional inspection to minimize risks. Everything was perfect. He ran to the workshop's door, shouting "OK!" His words penetrated the silent night, and the crowd waiting outside burst into cheers after 5 seconds, jumping and shouting. "I had made plans for my life pursuits and dreams in postgraduate days, which were to do something groundbreaking in my career or to lead and promote the development of the industry I would be in to some extent." At this moment, Zhao Jinliang made his life dream come true.

"A SENSE OF CRISIS UNVEILS OPPORTUNITIES AND CONTENTMENT LEADS TO FAILURE"

A clear mindset is necessary to independent innovation: A Sense of Crisis Unveils Opportunities and Contentment Leads to Failure. Zhao Jinliang presented the generation-II pitch system at the end of 2017 after years of research, which was smaller by 50% and cheaper by 25% compared with the first version, making it highly competitive. - In March 2018, the company won 90% of clients' orders; by the end of 2018, it inked a procurement contract for 203 sets of the pitch system with Zhejiang Windey; in 2019, it delivered as many as 900 sets, representing a record high; and in 2020, it sold 2,200 sets to many big projects, leaving many competitors behind.

Since the upgraded Gen-II directly influenced the maintenance cost, "I stand in shoes of every department related," he said. Emails he wrote were an example to the point: he first explained the technological part, then offered suggestions for procurement, manufacturing, testing and project maintenance. In case of manufacturing problems, he even worked around the clock at the factory. Efforts will be rewarded. He was promoted to the Vice General Manager of Shanghai Electric Power Electronics Co., Ltd. in October 2020.

Talking about what he has learnt from his current work, Zhao Jinliang referred to two aspects: professional management and constructive communication.

According to Zhao Jinliang, "professional management" requires proper methods for which he elaborated from technology and quality respects. "Every production step is affected by both quality and technology, so I fully devoted myself to this section in the first 6 months after I came here." A pre-production schedule is set prior to actual manufacturing; corrections are made during manufacturing; predictions are made ahead of factual results; and a summary is generated after project completion.

After an order is taken, a timeline shall be created before manufacturing, which specifies the execution time for each step till the delivery

ZHAO JINLIANG

date. Then, efforts shall be made to ensure that the task is implemented as scheduled while making necessary corrections or adjustments. "If materials have to be replaced, then you need to figure out how to communicate with the client in a manner that will make him/her agree with your plan, and the risks resulted from this action." At the same time, actively predict problems that might occur rather than let it be.

All these require the manager to be able to see the big picture and understand the know-how and every detail. However, Zhao Jinliang thinks even that is not enough: "In the event of failures in production, testing or application, we

shall dig into the problem and thoroughly analyze all aspects including direct causes, root causes, influence, and temporary and permanent remedies. If the cause cannot be identified, then is it possible that all products have the defect? Management quality is tested and proven in work coordination on ground that with steps intertwined with each other, proper arrangement shall take a number of factors into consideration: system, procedure, standard formulation, talent training and performance evaluation." As for communication, Zhao Jiliang's advice based on his rich work experience is that "think more of others."

See suppliers, clients and colleagues as friends, and do not blame or put pressure on them when they have problems "because no one wants things to go wrong. Once there is a problem, there must be something wrong. What we need to do is to understand the troubling situation, figure out the cause and fix it. Helping others is helping yourself." Zhao Jinliang's "management philosophy" goes like this. In the company, he is an experienced engineer and manager, and in his spare time, he likes playing ball games and walking. "Shanghai Electric makes me who I am today. Without the company, I am nobody." Zhao Jinliang said humbly: "My achievements owe to Shanghai Electric". As a man approaches the age of 40, Zhao Jinliang has set a number of goals for himself: do his job well and deliver the best products and services to clients; keep studying and empower himself; and spend more time with the family and treasure every moment with his children. "A Sense of Crisis Unveils Opportunities and Contentment Leads to Failure" is a quote by Mencius. Zhao Jinliang said that the opportunities reflected the vision of development, and all our sweat and preparation were to fulfill this mission. **D**



DEPTH REPORTS



INNOVATIVE
APPROACH



THOUGHTS ON THREE STAGES IN BUILDING A SOUND ECOLOGY

01

PURSUE ENTERPRISE-LEVEL ENVIRONMENTAL MANAGEMENT

Enhanced management is an important means and measure to addressing environmental issues because poor management accounts for many pollutions, which boosts enterprises to improve their environmental management in every respect. ISO14000, a series of international environmental management standards, is formulated to this point and meets the requirements of all kinds of organizations on improving environmental management. Many of Shanghai Electric's subsidiaries have obtained the ISO14001 certification, and moreover, quite a few have implemented the integrated management system that unifies standards Quality Management (ISO 9001), Environmental Management (ISO 14001) and Occupational Health and Safety (OHSAS 18001). The ISO 14000 family of standards shows the shift from "end control" to "pollution prevention" in the international environmental protection trend and reflects the vision of sustainable development strategy. More importantly, it condenses and translates advanced expertise on environmental management into standardized and practicable management tools and measures, by which it improves national and enterprise-based environmental management, polishes the corporate image, and drives the globalization of companies.

B

efore the policy Reform and Opening up put in place in 1978, it was said that how the bathroom, canteen and trash bin looked reflected whether the company was good or not. From 1978 on,

Chinese people have enjoyed an increasingly better livelihood together with a higher awareness of environmental protection, which is reflected in well-equipped restrooms as well as standardized canteens and garbage sorting. Harmonious relationships between man and nature are repeatedly highlighted and ecological development receives enormous attention unseen before.

President Xi Jinping's guidance has the consensus of all enterprises, which is that "we shall uphold the principle that lucid waters and green mountains are invaluable assets and prioritize ecological conservation and pursue a green path to development." The journey of how companies seek ecological conservation can be divided into three stages that evolve from the enterprise level and industrial level to the society level.

CHINA PAVILION EXPO 2020 DUBAI UAE OFFICIAL PARTNER

02

PURSUE INDUSTRY-LEVEL GREEN PRODUCTS

Shanghai Electric strengthens corporate management from the source and promotes efficient resource utilization, intensifying the green transformation in essential industries and fields to boost clean manufacturing, low-carbon development, ecological conservation, and improve ecological stability and sustainability. Optimize business structure and landscape, enhance the whole industrial chain, and pursue greener products and services.

Shanghai Electric boosts the development of the environmental protection industry and empowers industrial sectors of equipment-related manufacturing, technologies and services, which aim at reducing environmental footprints to conserve natural resources, energy and ecology. Meanwhile, it is committed to reinforcing industrial structure and ecology. By developing an effective and integrated industrial structure according to principles of ecological economy and ecological rules, Shanghai Electric achieves efficient output and sustainable environment and resource utilization by inter-manufacturing-system or -link coupling and multistage utilization of materials and energy, which makes the GDP-centered mindset obsolete and ecology the new priority. To build a beautiful home is a common dream for mankind, and we shall stick to the "green consensus" and endeavor to develop green industries and services.

能源装备
ENERGY EQUIPMENT

工业装备
INDUSTRIAL EQUIPMENT

集成服务
INTEGRATION SERVICES



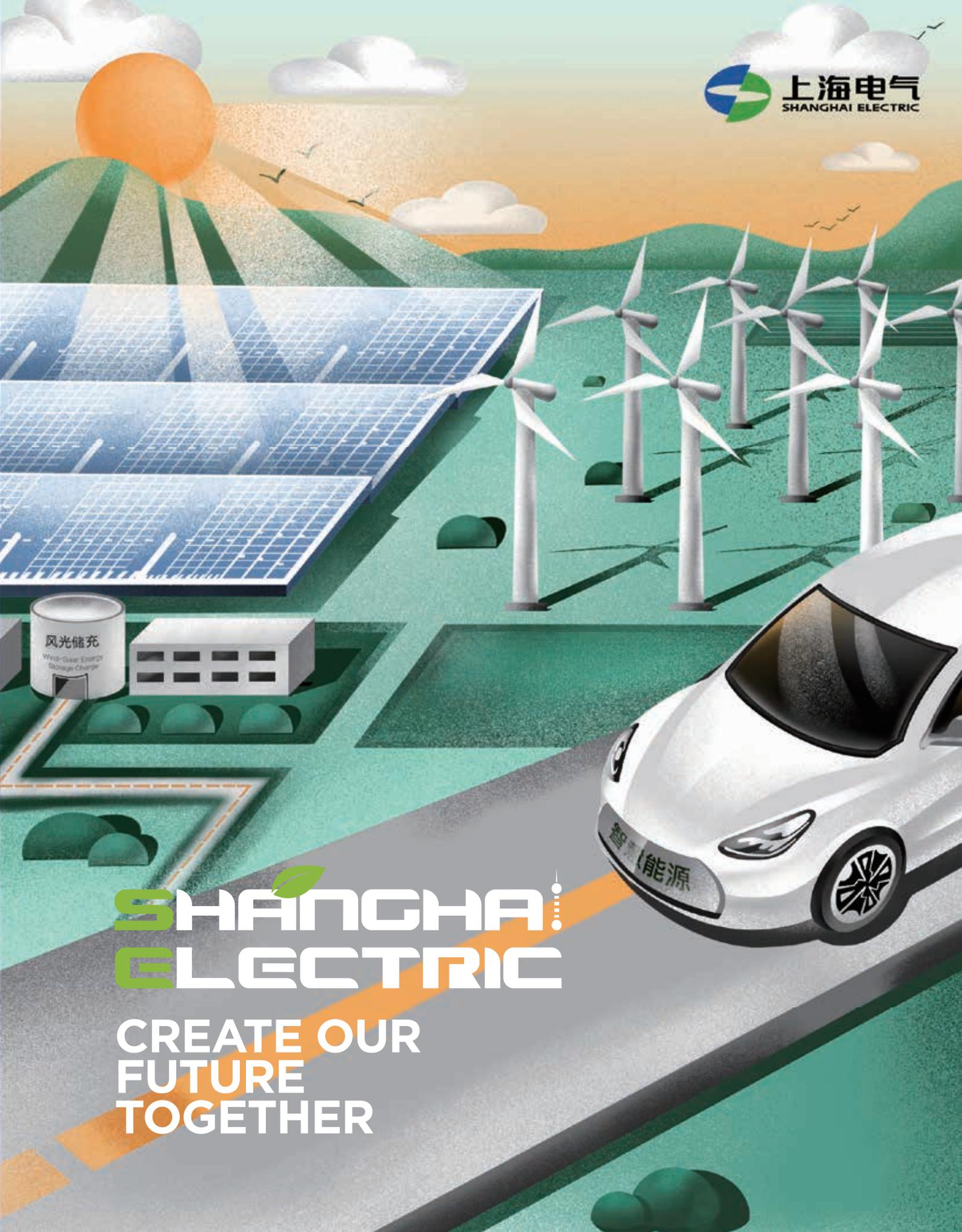
03

SEEK BALANCE BETWEEN BUSINESS STAKEHOLDERS IN SOCIETY-LEVEL ECOLOGY

On March 15, 2021, President Xi Jinping underlined that to peak carbon emissions and achieve carbon neutrality is an extensive and profound systemic reform for the economy and society, and should be incorporated into the overall layout of building an ecological civilization. He called for a spirit of perseverance in achieving the goals of peaking carbon emissions by 2030 and achieving carbon neutrality by 2060.

Ecological development sees the society, economy and environment as an integrated system and demands for effective socioeconomic growth in lockstep with environmental conservation and a healthy ecological cycle. The business ecology enables innovation in product supply models, which makes the sole product property more complex, introduces more application scenarios and builds up an industrial chain. New competitive arenas and commercial models emerge in each and every field due to the heavy blow of digital, information, internet and smart technologies. With technology empowerment, tomorrow is now. A society-level ecological development is necessary for an enterprise.

Our efforts to conserve the ecosystem will benefit not only this generation, but many more to come. More and more organizations achieve success by building business ecologies, and new terms like “cross-industry” “scenario” “link” and “platform” deliver tangible examples. For instance, Huawei sees suppliers as partners; Haier Group develops an open and sharing service platform to prepare for its business ecology alongside revenues and brands derived from the ecology; and the internet company Xiaomi is building up its large commercial ecology. We shall upgrade our strategies from competition-centered to business ecology-prioritized, which concerns not only the natural environment, but also society-level ecology, and pursue mutually beneficial cooperation in the society-level ecology by reaching a common ground between customers, employers, shareholders, suppliers, partners, facilitators, communities and the whole society. **D**



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CREATE OUR
FUTURE
TOGETHER