

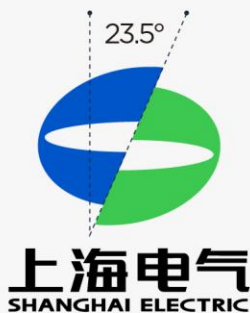


SHANGHAI ELECTRIC PROFILE

Jan 2024

SHANGHAI ELECTRIC GROUP CO.,LTD.





23.5° / Earth's axial tilt

The Shanghai Electric logo is also inclined at the same angle.

The perfect inclination angle signifies the elements of the earth and the change of seasons.

It also symbolizes the synergy between innovation and nature.

Shanghai Electric strives to be a world-class manufacturer leading in industrial development.

Blue **Technological innovation and intelligence**

The color of the sky and the sea represents technological innovation and modernization. It implies that Shanghai Electric promotes the transformation of traditional industries and drives the high-quality development by strengthening research and development in science and the application of intelligent technology.

Green **Sustainable coexistence of human and nature**

In addition to earth and life, green also symbolizes unlimited vitality and low-carbon strategy. In essence, it represents Shanghai Electric's commitment to improving industrial efficiency, reducing carbon emissions across the industry, promoting harmony between humans and nature, and integrating the green concept throughout all its development and business activities.

Blue-green integration **Openness, collaboration, and win-win cooperation, leading global industrial development:**

With blue and green, that is technology and sustainable development, at the core, Shanghai Electric will continue to leverage its advantages and work with global partners for mutual connectivity and prosperity. We will promote the high-end, intelligent and green development of industry and energy, making a positive contribution to global sustainability and enhancing the quality of life for mankind.

Co-existing with nature to protect the Earth, co-founding a society with the international community, and co-create the future together with inventors!

CONTENTS

目 录

STEP 01

GROUP OVERVIEW ————— 06

STEP 02

BUSINESS FIELD ————— 17

STEP 03

SUSTAINABLE DEVELOPMENT ————— 55



STEP 01



GROUP OVERVIEW



GROUP OVERVIEW



About the Group

Shanghai Electric, a leading global supplier of industrial-grade eco-friendly smart system solutions with a presence around the world, is dedicated to smart energy, intelligent manufacturing, and the integration of digital intelligence. Keeping up with the trends of high-end, eco-friendly, and smart growth, we apply our technological empowerment experience to promote high-quality industrial development both in China and around the globe and to generate green, sustainable value for a better human existence.

At Shanghai Electric, which is known as the center of China's power sector, we have claimed several national and international firsts over the past 120+ years. We won the China Industry Awards and boasts the highest brand value in China's machinery industry, at 215.628 billion CNY. In the smart energy field, we are creating solutions for multi-energy complementation between wind, solar, and hydrogen storage, as well as an integrated process of generation, grid, load, and storage. Furthermore, we also stay committed to constructing a new generation of comprehensive global electricity systems and all-round zero-carbon industrial parks. In the field of intelligent manufacturing, we provide solutions for Li-ion production lines, digital healthcare, rail transit and general equipment. In the field of digital intelligence integration, exceptional competence for extreme manufacturing enables us to deliver system solutions across many industry chains, including new energy automotive, large passenger aircraft, contemporary marine and digitization. Upholding the principles of opening up and mutually beneficial collaboration, we promote worldwide innovation and eco-friendly sustainable development through partnerships with global clients, partners, workers, and other creative minds by cooperating with more than 70 of the world's most prestigious enterprises.

In the future, Shanghai Electric will focus on low-carbon development and digital transformation by opening up new arenas and promoting new growth drivers, and will strive to be a leader in the pursuit of the "Dual Carbon Goals", new energy equipment production, and high-end equipment localization, utilizing the boundless opportunities in an innovative industrial ecosystem!

HISTORY



STARTUP

The history of Shanghai Electric can be traced back to at least 1902. Shanghai Dalong Machinery Factory is the earliest large-scale enterprise of Shanghai Electric, a symbol of the germination of the modern machine industry in Shanghai.

1902

Shanghai Dalong Machinery Factory was established



1916

Huasheng Electric Appliance Factory was established



1906

Shenchang Foreign Firm



1987

Shanghai Mitsubishi Elevator Co., Ltd., a China-controlled Sino-Japanese JV, was established

ESCALATION

Shanghai Electric seized the opportunity brought about by the reform and opening up of new opportunities. The company deepened the reform of institutional mechanisms through joint venture and technology introduction, focused on building a brand of high-end equipment manufacturing, and saw equipment and enterprise grow by leaps and bounds.

GROWTH

Starting from scratch, China's industry grew along with the Republic, and Shanghai Electric has created many firsts in China and the world.



1955

Successful pilot production of China's first 6,000 kW steam turbine



1958

Developed the world's first 12,000 kW double internal water-cooling turbine generator



1989

Completed China's first nuclear power unit, enabling nuclear power access in China for the first time



1961

Manufactured China's first 10000 ton hydraulic press

HISTORY



TRANSFORMATION

Shanghai Electric provides an unwavering commitment to high-quality development and focuses its major responsibilities and businesses at its core to make sustained efforts with industrial improvements through intelligent manufacturing and empowerment via its technologies. By continually optimizing its business structures and nurturing new driving forces for growth, Shanghai Electric has focused more on the improvement of the quality of its business performance and its core competitiveness.

2006

Successfully manufactured China's first 1000 MW ultra-supercritical turbine generator set and put into operation Yuhuan Power Plant



1995

Shanghai Electric established a JV with US Westinghouse, becoming the largest JV in China's energy production industry.



2023

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

2011

Delivered the world's first AP1000 Pressurizer for Sanmen Unit 1



2022

China's intelligent manufacturing integrated with German quality
An agreement for strategic cooperation was inked by Shanghai Electric and Siemens Healthcare



2021

No. 1 In Asia! Shanghai Electric's 11MW Direct-Driven Offshore Wind Turbine Rolled Off Production Line



2014

Shanghai Electric successfully acquired 40% of Ansaldo Energia's share.



2018

Delivered the world's first HPR1000 RVI for Fuqing Unit 5



Constructed the world's largest 950MW solar thermal + photovoltaic power plant project in Dubai



2020

Received the world's first award in the field of industrial intelligence - "Zhan Lu" Industrial Engine Award

FACTS & FIGURES



Total assets:

¥ **382.3** billion



Net assets:

¥ **80.89** billion



Brand value:

¥ **215.628** billion



Total number of patents:

9,248

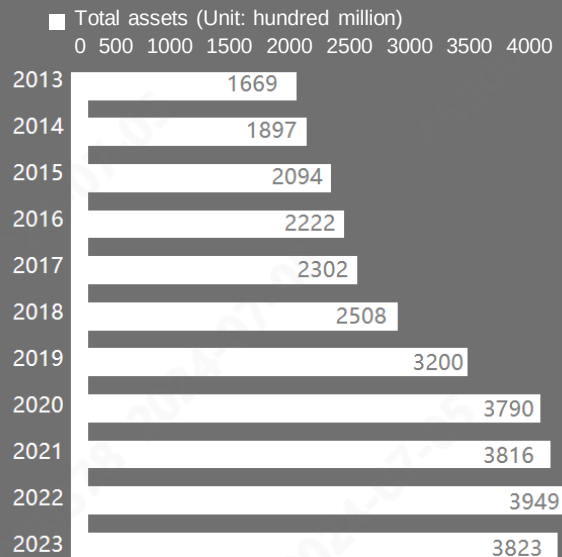


Number of employees:

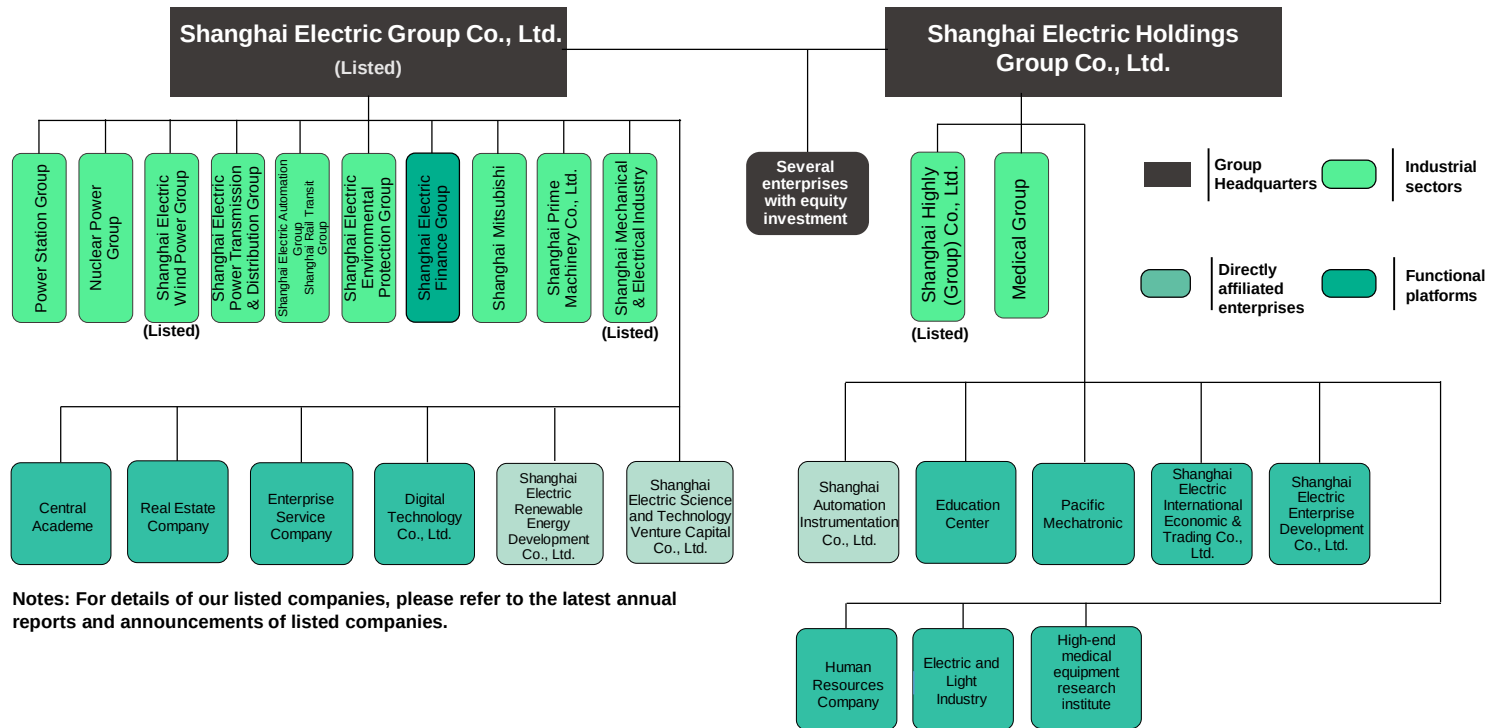
75,000

Shanghai Electric upholds the principles of “openness, coordination and win-win cooperation” while remaining committed to boosting the integrated development of new energy. With the help of science and technology, we have embarked on a new path of high-end, green, and intelligent development, thus transforming and upgrading the industry. Our goal is to become a world-class equipment manufacturing company that promotes human progress and the sustainable development of society.

Growth curve of total assets (2013-2023)



SHANGHAI ELECTRIC ORGANIZATION



TECHNOLOGY AND INNOVATION



About **1,000**

scientific and technological research projects are implemented annually

More than **16,000** R&D employees

About **69** national-level, provincial and municipal level science and technology awards have been attained

7 workstations set up for national postdoctoral research

9 national-level corporate technical centers

20 municipal-level enterprise technology centers

5 municipal academician (expert) workstations

9248 patents

Average annual R&D investment of

¥ **5.169** billion

8 provincial and municipal engineering technology centers

12 science and technology journals

80 high-tech enterprises

Shanghai Electric has been driving high-quality development fueled by scientific and technological innovation, with an average annual investment of over 5 billion CNY in R&D and an average R&D investment intensity of 3.61%. The Group implements approximately 1,000 scientific and technological research projects every year, and has achieved more than 60 science and technology awards at national, provincial and municipal levels. We have also obtained nearly 9,000 patents. With a strong emphasis on R&D and talent retention, Shanghai Electric has been breaking boundaries and hierarchical systems to build an open, collaborative, agile and efficient R&D ecosystem.

9 national-level science and technology awards

52 Shanghai Municipal Awards for Science and Technology

9248 patents As of the announcement date on December 31, 2022,

SHANGHAI ELECTRIC IN THE WORLD



Shanghai Electric upholds the principles of opening up and mutually beneficial collaboration by partnering with global partners to empower industrial companies around the world while pursuing high-quality and stable development.



Over **5,700**
overseas employees



The Group has established
partnerships with

70+ globally renowned
companies



Overseas assets exceed RMB

30 billion



Offshore revenue

accounted for **20%** of
the total revenue





STEP 02

**BUSINESS
FIELD**



SMART ENERGY

3

Implementation Paths



Energy
efficiency
improvement



Energy
substitution



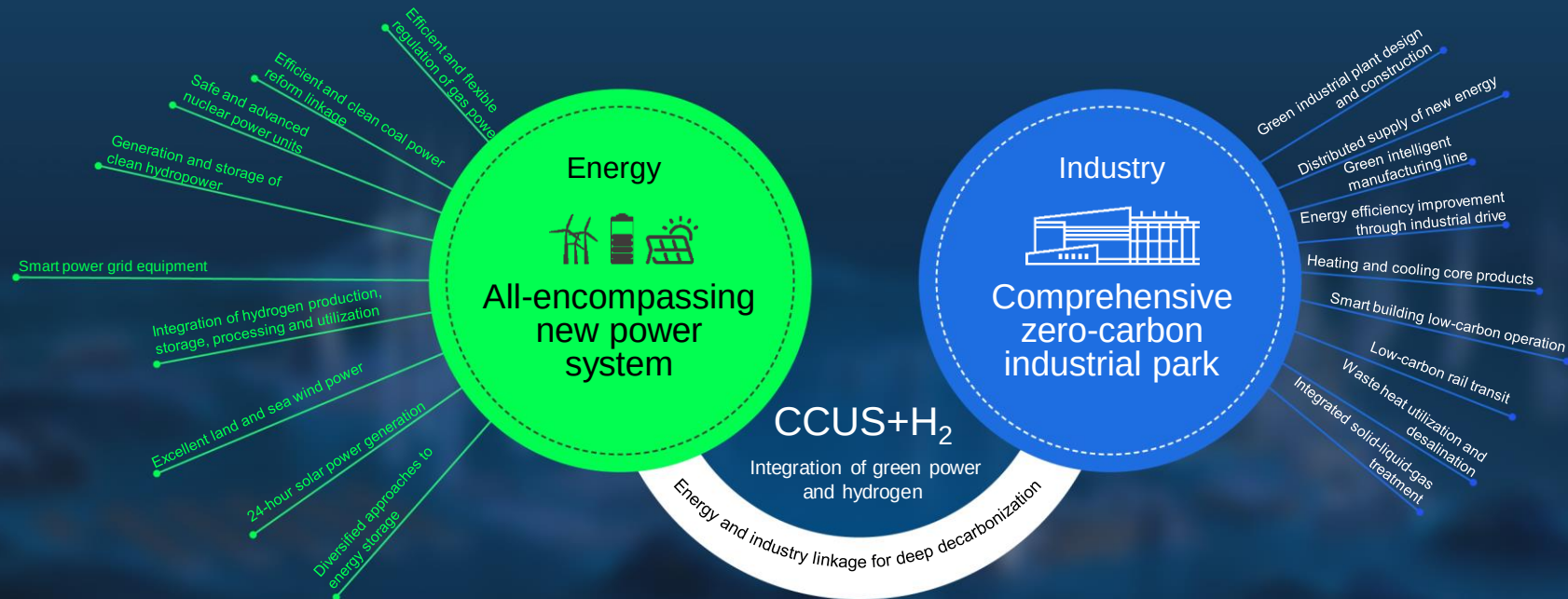
Resource
recycling

Shanghai Electric Dual Carbon Program

**High-end, smart, and green
products to promote carbon
reduction in energy and industry**



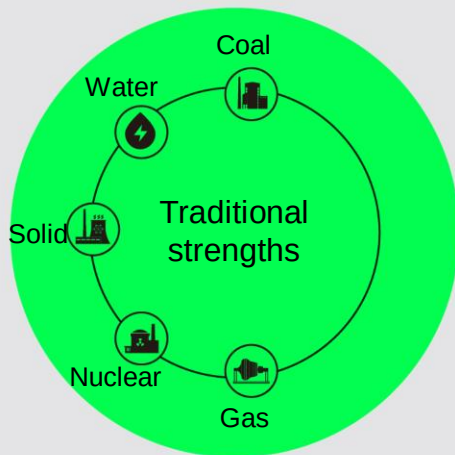
Two Major System Solutions for Carbon Reduction in the Main Battlegrounds



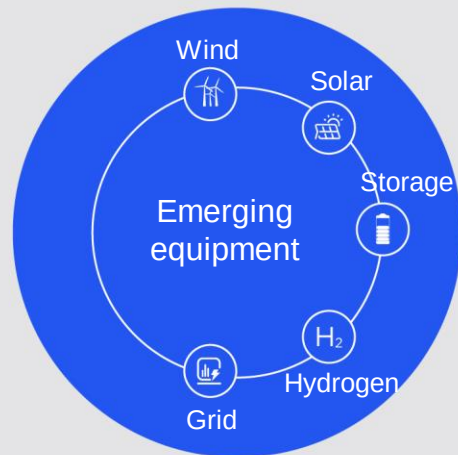
"Green power hydrogen generation + carbon capture to synthesize methanol, green power hydrogen to synthesize ammonia, etc."

Comprehensive Solutions for Renewable Energy System

With full play being given to the traditionally advantageous "coal, gas, nuclear, solid, water" equipment, we are also actively developing equipment for emerging areas such as wind, solar, storage, hydrogen, and grid applications.



Promoting the optimization of traditional and new energy sources



Efficient and Clean Coal Power Reform Linkage

Ensuring global energy security

As part of the national strategy for "safe carbon reduction", the Group will fully leverage its advantages in high-efficiency and clean coal power and new energy.

Equipped with world-class technologies, Shanghai Electric has developed a complete product line that ranges from 10 MW to 1,350 MW, and has broken records for the lowest coal consumption in the world.



Enhancing the "regulation" of power grids through "Reform Linkage"

Innovative flexible operation of low-pressure cylinder and cylinder cutting as well as other transformation technologies

Enhancing coal power benchmarking for energy efficiency, heating performance, and flexibility

Ruiguang Power

National coal power energy saving and emission reduction demonstration power plant

2 sets of 300 MW co-generation units

Shanghai Electric provides a full set of main equipment for electromechanical furnaces and their auxiliary equipment

Huaneng Ruijin Project

It is the first domestic DCS/DEH integration project with major technological equipment, and the world's first million-grade double-engine back heating and double-reheating ultra-supercritical coal-fired power unit.

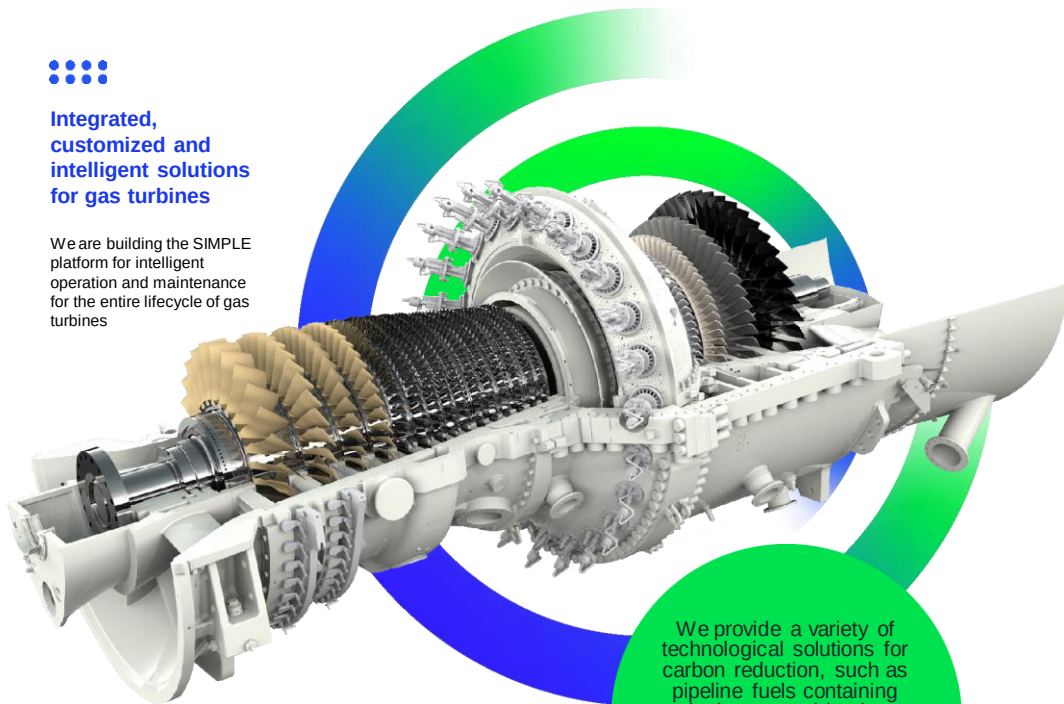
Comprehensive coal consumption for power generation: **249.7g/kWh**





Integrated,
customized and
intelligent solutions
for gas turbines

We are building the SIMPLE
platform for intelligent
operation and maintenance
for the entire lifecycle of gas
turbines



We provide a variety of
technological solutions for
carbon reduction, such as
pipeline fuels containing
hydrogen and in-situ
hydrogen doping at power

plants, with a **30%**
hydrogen doping rate.

Efficient and flexible regulation of gas power

As such the technology of independent gas
turbines continues to advance steadily

Shanghai Electric has achieved the highest independent
manufacturing rate in gas turbines, which are considered the
"crown jewels of the industry".

As a heavy-duty gas turbine equipment supplier with independent
intellectual property rights in China, Shanghai Electric owns a complete
industrial chain from research and development, manufacturing, sales to
service of gas turbines. With its three leading products, the AE94.3A, the
AE94.2 (or AE94.2K/KS), and the AE64.3A, which are all characterized by
cleanliness, efficiency, and flexibility, the Group offers diversified solutions
and great economic value.

Datang Gaoyao Project

The first gas turbine project in
China to achieve independent
commissioning



Liaoning Bensteel Project (AE94.2KS)

Shanghai Electric's first low-calorific
value gas turbine project in China



Safe and Advanced Nuclear Power Equipment

Active, safe and orderly development of nuclear power

With the development since the 1970s, Shanghai Electric has become the nuclear power equipment manufacturing group in China with the longest history, the most manufacturing deliveries, the most complete supply chain, the most widely applied manufacturing technology, the maximum equipment capacity and the broadest international cooperation.

Shanghai Electric has the capability to supply reactor pressure vessel (RV), steam generator (SG), pressurizer (PZ), reactor vessel internal (RVI), control rod drive mechanism (CRDM) reactor coolant pump (RCP), pumps and vessels of Nuclear Class II & III, fuel handling equipment and nuclear valves in nuclear island, turbine, turbine-generator, auxiliary equipment and pumps in conventional island, large nuclear castings & forgings, nuclear fans, motors, nuclear control & instrumentation, elevator and spare parts & on-site services. etc.



40 key
technologies



469
authorized
intellectual
property rights



249 sets of
nuclear power
main equipment
delivered



Shanghai Electric has realized the mass production and complete-set delivery of nuclear major equipment with the second generation plus technology, the third generation technology including AP1000, EPR HPR1000 & CAP1400 and the fourth generation technology such as HTR & TMSR (Thorium Molten Salt Reactor) and is developing and manufacturing key equipment of the fourth generation technology such as China Fast Reactor (CFR) & CIADS, and key equipment of Fusion Reactor and nuclear heating reactor etc.

Generation and Storage of Clean Hydropower

High starting point to promote high-quality development

The water turbines are able to change speeds quickly to accommodate variable-speed operation and constant-frequency operation and can provide active power to the grid quickly through speed changes. In addition to being able to respond in seconds or even milliseconds, they can also quickly adjust to fluctuations in power output in the grid, which will support China's future "water-solar complementary" grid operational characteristics.

More than 450 pumped storage units installed worldwide
Total power output exceeds 60,000 MW
Built high-head, large-capacity units with world-leading technology in spite of the great difficulty factor

The minimum output range of a single unit can be less than 10 MW and the maximum can be more than 500 MW
The minimum head range can be less than 50 m while the maximum can exceed 800 m



Changlongshan pumped storage plant

Located in Anji County, Zhejiang Province, where the idea that "lucid waters and lush mountains are invaluable assets" was born. On May 4, 2022, Unit 5 of the plant successfully passed the 15-day test run and was officially connected to the grid for commercial operation. The rated water head of the power station is as high as 710 m, which is the highest among the pumped storage power stations already put into operation in China, while the reversible unit with 600 r/min output above 300 MW is the first of its kind in the world.

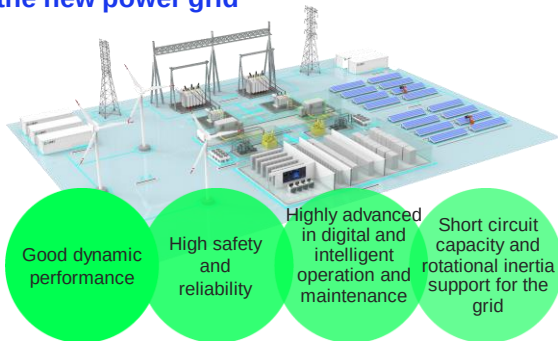
Unit 5 and Unit 6 supplied by Voith Hydro Shanghai
Rated speed: 600 r/min
Single unit capacity: 350 MW

Entering "no man's land", the design, manufacture, installation and commissioning of the units have the world's highest difficulty coefficient and leading technology level

Smart Grid Equipment

Providing customers with an efficient, stable and strong smart grid

The world's leading intelligent synchronous condenser island system solution
Protecting the new power grid



Providing "strong grid" support for the new power system

Through continuous UHV technological breakthroughs, Shanghai Electric has built an industrial chain of high voltage, smart operation, and electronic power, which covers the full lifecycle of power transmission and distribution. The group aims to become a benchmark supplier of integrated and smart power transmission and distribution solutions by developing a "smart power transmission and distribution ecosystem".



Top 2 transformer bidder for State Grid

Over 2,500 km of power transmission and distribution lines at 220 kV and above



Excellent Onshore and Offshore Wind Power

A full life cycle approach to energy asset management

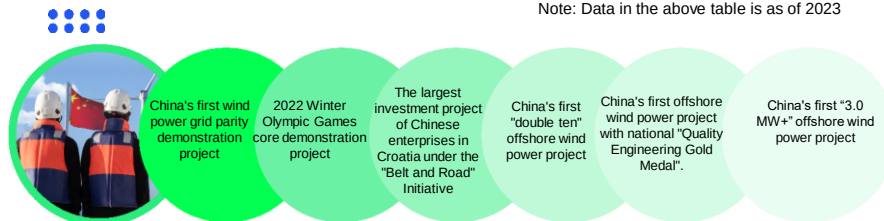
Vertically integrate the upstream and downstream of the wind power industry chain and provide full life-cycle solutions for wind power; By empowering the track and application scenarios of the chain horizontally, we aim to create a multi chain symbiotic ecosystem and provide a full life-cycle solution for energy assets.

By May 2023, Shanghai Electric's cumulative installed offshore wind capacity with grid connection has exceeded **10 million** kW

In 2015-2022, in terms of offshore wind power installations, Shanghai Electric has ranked No. 1 in China for eight consecutive years

32.4 GW+ installed	 Reduced carbon dust by about 18.121 million tons	 Reduced NO _x emissions by about 984,000 tons
 Approximately 66.535 million tons of CO ₂ emissions will be reduced	 The reduction of SO ₂ emissions by 2.002 million tons will be achieved	 26.614 million cubic meters of land were reforested

Note: Data in the above table is as of 2023



24-hour Solar Power Generation

100% renewable energy for 24 hours
continuous power generation

The main components of the whole system, such as a mirror field, heat absorber, heat exchanger for molten salt storage, turbine generator and air cooling island, can be supplied by Shanghai Electric.



Entering the fields of heterojunction cells and pan-semiconductors

With independent PV technology, Shanghai Electric developed 20 GW of high-efficiency heterojunction cells and modules. A leader in heterojunction photovoltaic equipment systems with an annual inventory capacity of more than 20GW, bringing high-efficiency solar cells into the micro-crystalline HJT era.

950 MW hybrid CSP+PV project in Dubai

Annual emission reduction of 1.6 million tons of CO₂

World's largest single-site CSP+PV project in terms of installed capacity

World's largest single-site CSP+PV project in terms of land area

World-leading Wireless HelioStat Technology



700 MW
CSP

44 square
kilometers

70,000
heliostats

250 MW
PV

6,162 standard
football fields

Shanghai Electric Dubai Phase V 900 MW photovoltaic project

Largest photovoltaic power plant project under construction in Dubai



The project covers an area of **10.1** square kilometers

Equivalent to the size of **1,350** football fields

Installed capacity of Power: **1050** MW on DC side

Constructed in three blocks, with Power: **300** MW of grid-connected capacity on the AC side of each block

Integration Hydrogen Industrial Chain

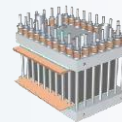
Actively developed core equipment for the integration of hydrogen production, storage, refueling and utilization

In addition to providing the core equipment for the entire industry chain of "production, storage, refueling and utilization" of hydrogen energy, Shanghai Electric also provides customers with solutions for "renewable energy power generation + hydrogen production by electrolysis of water + green chemical / production, storage, and fueling integrated station / hydrogen energy storage".



An integrated smart energy demonstration project at Minhang Industrial Park showcase a comprehensive system of wind, solar, storage, electrochemical energy and hydrogen energy

● Distributed multi-generation to meet the energy demand of industrial parks for cooling, heating, electricity and hydrogen. Over 90% of the equipment used by the industry is provided by Shanghai Electric, and the company offers a comprehensive range of capacities to meet the demands of users. **300Nm³/h + PEM electrolysis hydrogen testing platform**



Diaphragm compressor

- Suitable for hydrogen refueling stations, large-scale hydrogen production and other scenarios requiring hydrogen pressurization
- Product range covers 20-45-90 MPa and other pressure levels
- Customized according to user's requirements.



Products for hydrogen production through alkaline electrolysis

Suitable for centralized and continuous hydrogen production scenarios

We offer products ranging from 100 to ~2000Nm³/h

Adoption of "N to 1" system design

The maximum rated hydrogen production of a single electrolyzer can reach a hydrogen production capacity of **2000 Nm³/h** while the DC power consumption of the electrolyzer is **≤4.2kWh/Nm³**, which is at a globally leading level.

Safe operation

- Employed highly corrosion-resistant and long-lasting electrode catalyst
- Optimal diaphragm material was selected for its high performance and low gas permeability
- Purity of hydrogen gas exceeding 99.999%

Products for hydrogen production through PEM electrolysis

Suitable for distributed and flexible hydrogen production scenarios

We offer products ranging from 5 to ~200 Nm³/h

Adoption of "N to 1" system design

With a single electrolyzer's maximum hydrogen production capacity of **200 Nm³/h**, and the electrolyzer's DC power consumption of **≤4.1kWh/Nm³**, which is at a domestic leading level in China.

Hydrogen storage device

- It is suitable for hydrogen refueling stations, large-scale hydrogen production, and other scenarios requiring hydrogen storage
- Product range covers 1.6-20-45-90 MPa and other pressure levels
- In horizontal, vertical, spherical tank, single/multi-layer wrapping and steel tape staggered winding forms and Type III tank



Diversified Energy Storage Approaches

One-stop solution provider for energy storage systems

A number of avenues have been planned ahead, including molten salt thermal energy storage, compressed air energy storage, pumped storage, redox flow energy storage, lithium-ion energy storage, flywheel energy storage, and superconducting energy storage.



300 MW compressed air energy storage project in Yingcheng, Hubei



Multi-stage wide load compressor



Large-capacity, ultra-high-speed motors



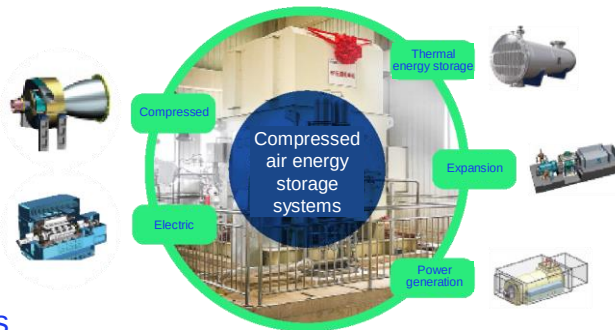
Generator



Multi-stage high-load turbine expander



Arrayed supercritical air regenerative heat exchanger



Lithium-ion energy storage system

The Nantong base, located in East China, stands as the most advanced and large-scale industrial base for lithium-ion storage systems in the region. It has successfully completed the construction of a 5 GWh lithium-ion storage system.

Industrial and commercial energy storage

It is one of the largest smart energy demonstration projects in Minhang Industrial Park, Shanghai, with a capacity of 4 MW/12.6MWh

Centralized energy storage

Independent 100 MW/200MWh energy storage power plant project in Jinzhai, Anhui Province



Redox flow battery energy storage

Deeply rooted in redox flow technology, we possess the capability for the modularized design and manufacturing of a variety of electric stacks, electrolyte solution, and system solutions, demonstrating a robust engineering delivery capability

1 MW/5MWh redox flow battery energy storage project on the Upper Yellow River in Qinghai



A 100 MW/600 MWh vanadium redox flow energy storage project in Baicheng, Jilin

China's first grid-side shared energy storage plant with the largest scale and the lowest operating temperature

INDUSTRY

Comprehensive Solutions for Zero-carbon Industrial Parks

We have achieved comprehensive green environment, from source design to terminal recycling, from intelligent production line to efficiency improvement, from travel to building to energy consumption

Integrated solid-liquid-gas treatment and carbon reduction

First comprehensive maintenance program in green rail low-carbon travelling

80% of the market for LT-MED is based on waste heat utilization and desalination

Over 70 years of industry-driven energy efficiency improvements

Intelligent building low carbon operation 1/8 elevators

Green park design and construction for 7,000+ projects

Distributed new energy supply to the first certified "zero-carbon" park in Guangdong Province

Lithium-ion battery, automobile, aircraft green intelligent manufacturing line

1/7 global market share of heating and cooling core products



Green Industrial Plant Design

Carbon reduction at the source

As a company with nearly 70 years of industrial design experience, we offer carbon reduction services at source to large industrial customers.

Design and implementation experience of **8,000+** projects

Rich industrial engineering experience

Won nearly 300 national, provincial and ministerial project awards

Providing whole-process services and comprehensive solutions for hundreds of enterprises in more than 30 countries around the world

115+ effective patented technologies

Almost every patented technology has been applied in engineering cases with proved value

130+ research projects

Each year, we invest more than RMB 100 million in process optimization, capacity development, equipment development and the establishment of design standards



Human Horizons Shanghai R&D Centre



Shanghai Xinzhou Building project

Campus planning

Technical Services

Engineering design

Providing complete sets of equipment

EPC (Engineering, Procurement, Construction) for CSP projects

Project management

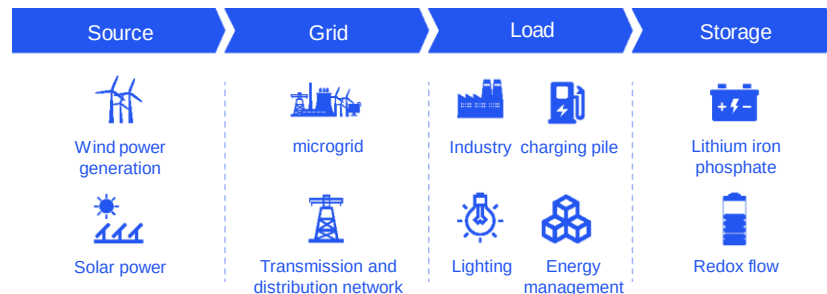
Post-evaluation



Distributed Supply of Green Energy

Achieve green energy utilization

The Shantou base is Guangdong's largest zero carbon demonstration project. The wind turbine being installed at the base achieved the first "black start" in history.



Discussion on high-quality energy development

"Model Project Award for High-quality Energy Development"

Comprehensive energy cost reduction by **15%**

Green Intelligent Manufacturing Line

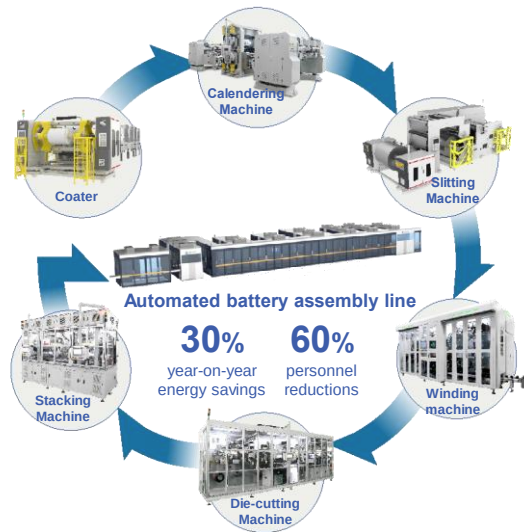
Decarbonization of production and operation processes



Lithium battery automatic production line



Aerospace automation assembly



World-leading technology

More than a hundred world-recognized patents

Industry-leading products

Lithium-ion production equipment, industrial robots, aerospace automation equipment

Latest business models

One-stop smart factory from top-level design to equipment and production line implementation

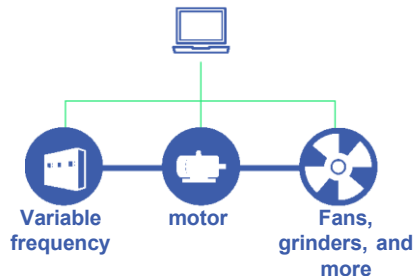


Energy Efficiency Improvement Through Industrial Drive

Energy efficiency for the most energy-intensive customers

From motors and frequency converters to loads, our integrated industry-driven solutions provide customers with reliable, efficient, high-performance technologies and products for energy savings and consumption reductions.

Industry-driven smart management system



Motor

Accounting for more than **25%** of the national market share of large and medium-sized direct/ alternating current motors

87
series

Hundreds
of models



Medium-voltage Variable-frequency Drive

Fuji Electric IGBT Medium-voltage Drive inverter FRENIC4600FM6e Can directly drive high-voltage motors



Fans

To date, Shanghai Electric's axial flow fan has been the only one of its kind to be granted the golden prize at the China Quality Awards

Nearly 50% of the domestic market share

Maximum unit capacity up to **1,350 MW**



Pulverizing Equipment

Over 35% of the domestic market share

Over 5,500 sets of high, medium and low-speed coal mills for international and Chinese clients

Heating and Cooling Core Products

Providing sustainable cooling and heating solutions to ensure a comfortable life and offering leading transportation solutions



In the field of air-conditioning compressors

A total of 4 world-class green factories and 5 technology support centers have been established by Highly around the world. More than 1,000 types of high-efficiency energy-saving compressors are available in 9 series, ranging in refrigerant, voltage, and frequency. It accounts for one in seven of the global market share for high-efficiency compressors.

The most complete product lines and models

9 lines

1000+

energy-efficient air conditioning compressor types

International services

1 out of every 7 air conditioners globally

incorporates Highly compressors
4 factories and 5 technological centers / localized services



In the field of automotive parts

Shanghai Highly (Group) Co., Ltd. is committed to making innovations in auto emission reduction technologies. It is the first to develop advanced compressors and thermal management systems for new energy electric vehicles, while providing high-quality, safe and reliable precision casting components for global automobile manufacturers.

No.1

in the new energy
bus market

9

countries

28

manufacturing
sites

5

R&D & technical service
centers



Smart Building Low-carbon Operation

From Green Elevators to Intelligent Buildings

1 out of every 8 elevators in China is produced by Shanghai Mitsubishi Elevator, a subsidiary of Shanghai Electric Group

Shanghai Mitsubishi Elevator Co., Ltd., controlled by Shanghai Electric, is among the Top 500 enterprises in China's machinery manufacturing industry and foreign-invested enterprises, as well as the Top 10 enterprises with core competitiveness in China's machinery industry. With a track record of sustained growth, Shanghai Mitsubishi Elevator has successfully installed over 1.2 million elevators in the market. These elevators have been sold in 94 countries and regions worldwide.



20.5 m/s
high-speed
elevators

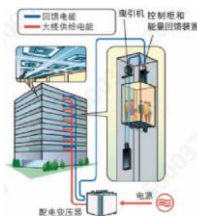


> 1,600
inventions patented

1,107 patent
applications

737 patents
licensed

The DOAS system developed by Shanghai Mitsubishi can increase the handling capacity of the elevator system by up to **30%**

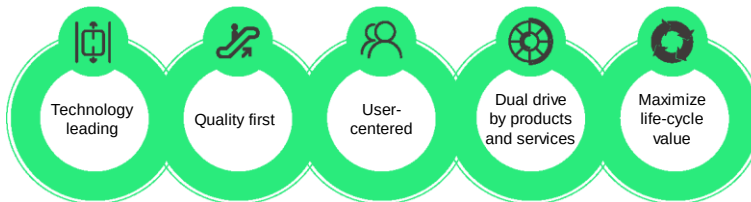


Energy is channeled back to the grid through elevator regenerative drives, resulting in approximately **30%** energy savings compared to traditional methods.



Enjoyment while going up and down

For 11 consecutive years, Shanghai Mitsubishi Elevator has been the preferred supplier of elevators for the Top 500 Real Estate Companies



Low-carbon Rail Transit

Constantly improving the efficiency of rail transit

With nearly three decades of experience in urban rail transit, Shanghai Electric has developed a comprehensive solution for urban rail transit that includes mechanical and electrical equipment. We have expanded our business to serve the majority of cities in China that employ rail transit.



Shanghai Electric's TSTCBTC@2.0 has increased the metro turn-back efficiency by **23%**



Shanghai Lingang Intelligent Digital Rail Transit (iDRT) Line
1/2/3 can save **40** liters of diesel per hour



Which is equivalent to a CO₂ emission reduction of **105.2** kg



A carbon emission reduction of **28.68** kg

Introducing the first all-inclusive maintenance solution in China



Waste Heat Utilization and Desalination

F-MED technology for industrial waste heat utilization helps reduce carbon emissions

As a one-stop solution provider for freshwater resource management, Shanghai Electric offers comprehensive engineering services and solutions related to seawater desalination and wastewater treatment, including engineering design, equipment supply, construction, and operation services.

A daily capacity of **530,000 tons** for thermal desalination
Ranking 1st in China

F-MED technology costs less than 3 yuan per ton of water, which is over **50%** lower than conventional steam heating systems.

A world-leading daily capacity of **410,000 tons** for membrane desalination
First-class in China



Helping customers reduce annual CO² emissions by **770,000 tons**

Shandong Yulong Petrochemical Industrial Park

Reduce the consumption of surface water and groundwater through hybrid thermal-membrane desalination

**80,000 tons/day thermal method +
80,000 tons/day membrane method**



Zhejiang Petroleum & Chemical, Zhoushan, Zhejiang

Phase I and Phase II of the largest EPC project in China for MED seawater desalination

Daily freshwater production: **305,000 tons**

Integrated Solid-liquid-gas Treatment

Actively promoting industrial park recycling transformation

With the environmental protection solutions it has developed, Shanghai Electric contributes to China's national goals in areas such as solid waste treatment, water treatment, and air pollution control, helping to reduce carbon emissions and pollution. With its independently developed core technologies, extensive key process planning experience, and strong capabilities in equipment manufacturing, Shanghai Electric offers comprehensive solutions and one-stop services to users.

Water Treatment

Provide integrated water treatment system solutions
"Internet+ technology" and "Intelligent Water System"

Rural household sewage treatment

10+ provinces and municipalities	300,000+ users
20+ achievements	2,000+ sets of integrated equipment

Solid waste treatment

Provide comprehensive service

Rich EPC and management experience

Household waste incineration

80% capacity reduction to reach maximum waste reduction	Plant thermal efficiency of 29%	400-500 kWh/ton Efficient recycling of the waste in power generation
Operation of 8,000 hours/year		High-temperature environment measuring 1,000° C + 3T1E for harmless disposal of hazardous waste
Hazardous waste disposal		Biomass conversion
Cumulative 460,000 tons/year (construction in progress)		Processing capacity 3,254,000 tons/year

Air quality governance

345 denitrification project	118 desulfurization project	79 ultra-clean dust removal projects	22 integrated businesses for innovative solutions for energy conservation and environmental protection	17 multi-pollutant removal systems	25 overseas projects
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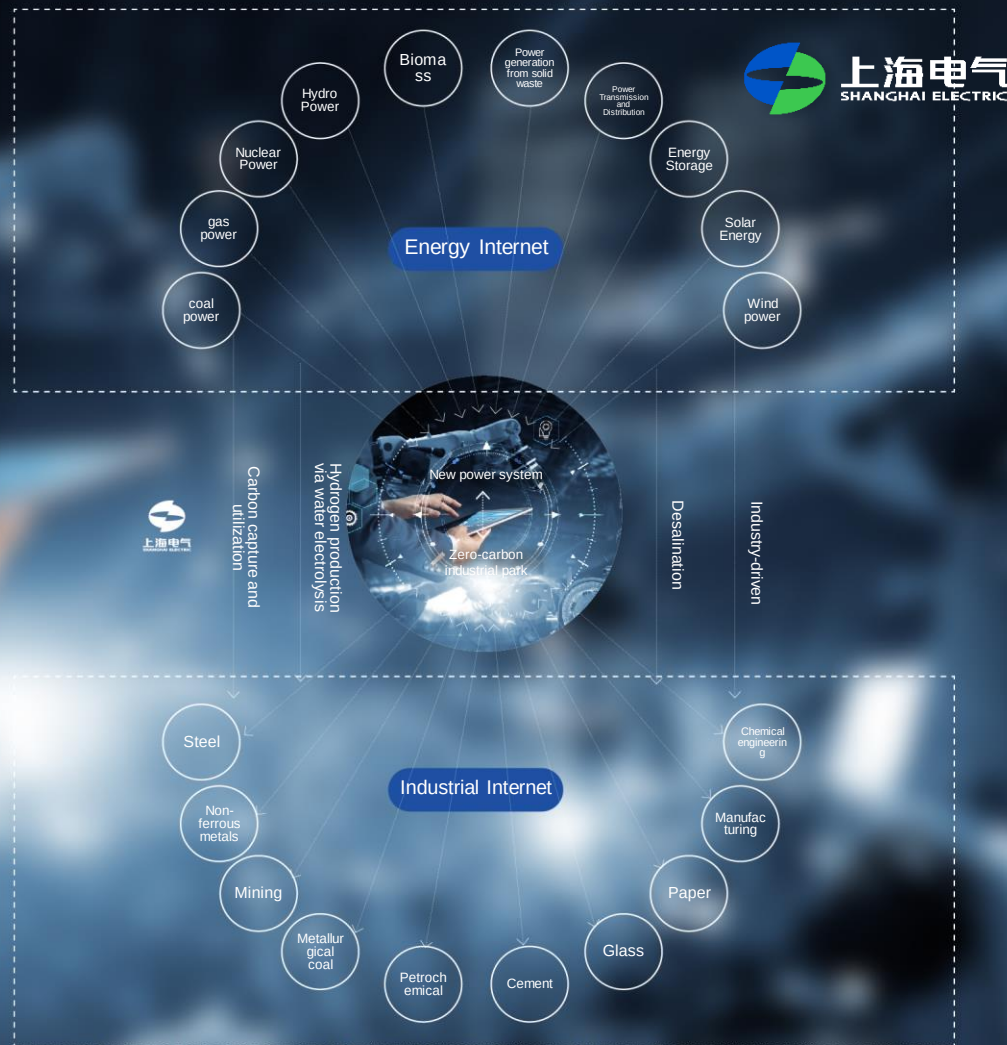
Huaibei Municipal Water Distribution Engineering by Transferring Water to North



Foshan Medical Waste Treatment Project

IoE + IIoT: Coordinated Development of Energy and Industrial sectors

As efforts to reach carbon neutrality and carbon peaking continue, it has become increasingly important to coordinate the development of the energy and industrial sectors to achieve "deep decarbonization".



INTELLIGENT MANUFACTURING

Shanghai Electric has developed remarkable production capabilities, supported by cutting-edge techniques and technology. With a commitment to developing a comprehensive industrial chain for intelligent manufacturing, we provide essential components, advanced smart equipment, industrial software, and system-integration services. Shanghai Electric has successfully developed globally leading intelligent system solutions. We specialize in various fields, such as lithium-ion battery production lines (including equipment for lithium battery production and integrated smart factory solutions), digital healthcare (such as MRI, CT, ultrasound, medical rehabilitation robots, etc.), rail transit (including vehicles, medium-capacity digital rail transit, signal control, comprehensive maintenance, integrated monitoring, etc.), and general equipment (industrial robots, high-end CNC machine tools, and other automation equipment).



**Automatic
production line**



**Digital
healthcare**



Rail Transit



**General
equipment**

Automatic Production Line

Shanghai Electric offers customers automated production lines that fit their digital and intelligent manufacturing needs with its extensive experience and technical expertise in automation equipment and integration services.

Lithium-ion Battery Production Line

Shanghai Electric is among the few providers that offer smart factory solutions for lithium battery production

Having developed cutting-edge technology for the manufacturing of lithium batteries, we offer complete solutions for automated battery manufacture that include planning, designing, implementing processes, obtaining power assistance, controlling the environment, and more. Our solutions encompass all aspects of battery production, including pulping and coating, calendaring, slitting, laser cutting & winding, assembly, battery formation and grading, module, PACK, logistics, and more. We strive to fully meet the needs of our customers in terms of automated, digitized, and intelligent production.

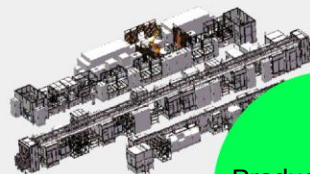
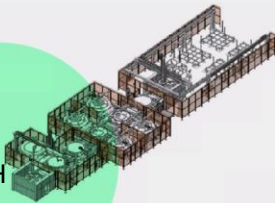
Electrolysis of Water to Produce Hydrogen Line

In February 2023, Shanghai Electric successfully delivered a hydrogen fuel cell pilot production line to an automotive industry customer. The line comprises assembly and testing equipment for fuel cell components, covering the entire process from component input to final packaging. A comprehensive line control strategy is also incorporated to ensure smooth operation.

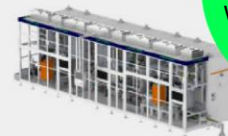
80-90%
automation
rate

4 compatible
models

Capacity
of 25 JPH

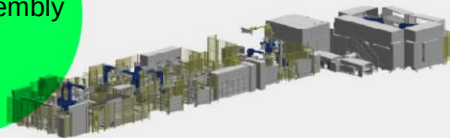


Production line for
motor controllers



All-in-one 4680
laser cutting &
winding machine

Module assembly
line



Digital Healthcare

The company provides high performance diagnostic and therapeutic medical devices for radiographic imaging, ultrasound imaging and medical robotics, as well as comprehensive solutions with a focus on products and services.

With the aim of reducing dependence on imported products, Shanghai Electric Medical Device Group is dedicated to boosting the development of high-end medical devices through technological innovation. Particularly in the fields of "radiographic imaging", "ultrasound imaging," and "medical robotics". The company provides core comprehensive solutions with "product+service" ranging from the overall design and construction of hospitals to the configuration of medical equipment. By integrating external collaboration with independent research and development, the company has established a development model which includes nearly 20 years of service experience and a team of over 600 professional engineers. This has resulted in the establishing of a comprehensive medical development system including disease prevention, diagnosis, treatment and rehabilitation.

20 years
customer service
experience

600 professional
engineers

Recognized by
30,000 Chinese users



Radiographic
imaging
Magnetic
Resonance
Imaging
X-Ray Computed
Tomography



Ultrasound
imaging



Mobile Health
(mHealth)
Auto-lifting
Heavy Truck
Mobile Digital
Radiographic



Medical
robotics



Comprehensive Rail Transit System Solutions

Covering more than 90% of electromechanical equipment and systems in urban rail transit

Shanghai Electric Group is recognized globally as one of the few providers of a **comprehensive range of rail transit electromechanical equipment and systems**

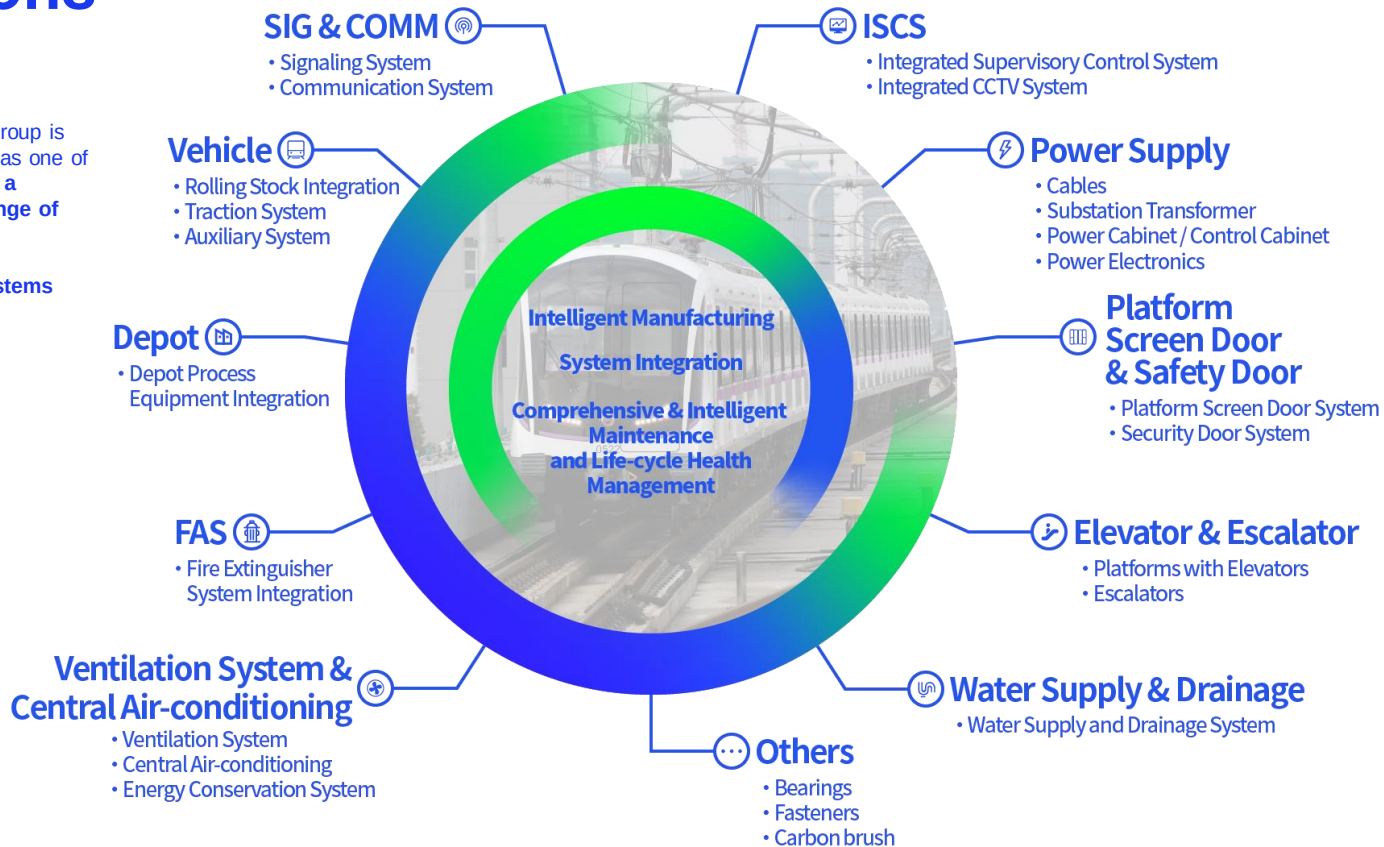


Shanghai Metro

Line 5



Line 14



General Equipment

CNC machine tools

With our expertise, we can design and manufacture large precision grinding machines as well as **medium to high-grade CNC machine tools**. The products we offer include over 200 different varieties and 600 specifications of **high-precision CNC grinding machines**, intelligent machine tools, flexible machining units, intelligent manufacturing units, and more. A wide range of industries use our machines, including automobile, aerospace, steel metallurgy, and engineering machinery. We are committed to providing exceptional machine tools and services to China's equipment manufacturing industry.

Provide customers with a selection of

over **200** different varieties

and **600** specifications



Over **250,800** units employed in China as of Oct 2023



Over **1,000,000** units employed globally as of Aug 2023



Maximum processing diameter of
3,000 mm

Maximum machining weight of
250 tons

Highest machining accuracy of
nanometer scale

* Refers to maximum data from all product series

Industrial Robots

With our robust R&D, design, and manufacturing capabilities, we are able to deliver highly reliable robots equipped with innovative technologies to our users. We offer over 260 types of robots with load capacities ranging from 0.5 kg to 2.3 tons. These robots are widely used in various production processes such as **handling, assembly, welding, casting, painting and palletizing**, to cater to the intelligent manufacturing needs of different industries.

Our new collaborative robot series, CRX, designed for human-robot collaboration, provides users with precise, flexible, and safe yet comprehensive solutions for the industrial manufacturing sector.

House-Building Robots! FANUC Assists BROAD Group in Establishing Intelligent Building Factory

The Internet is buzzing with a viral video showcasing the remarkable construction of an 11-story house in just 28 hours. The building, known as 'Holon', was built using the innovative stainless steel core plate technology developed by BROAD Group.

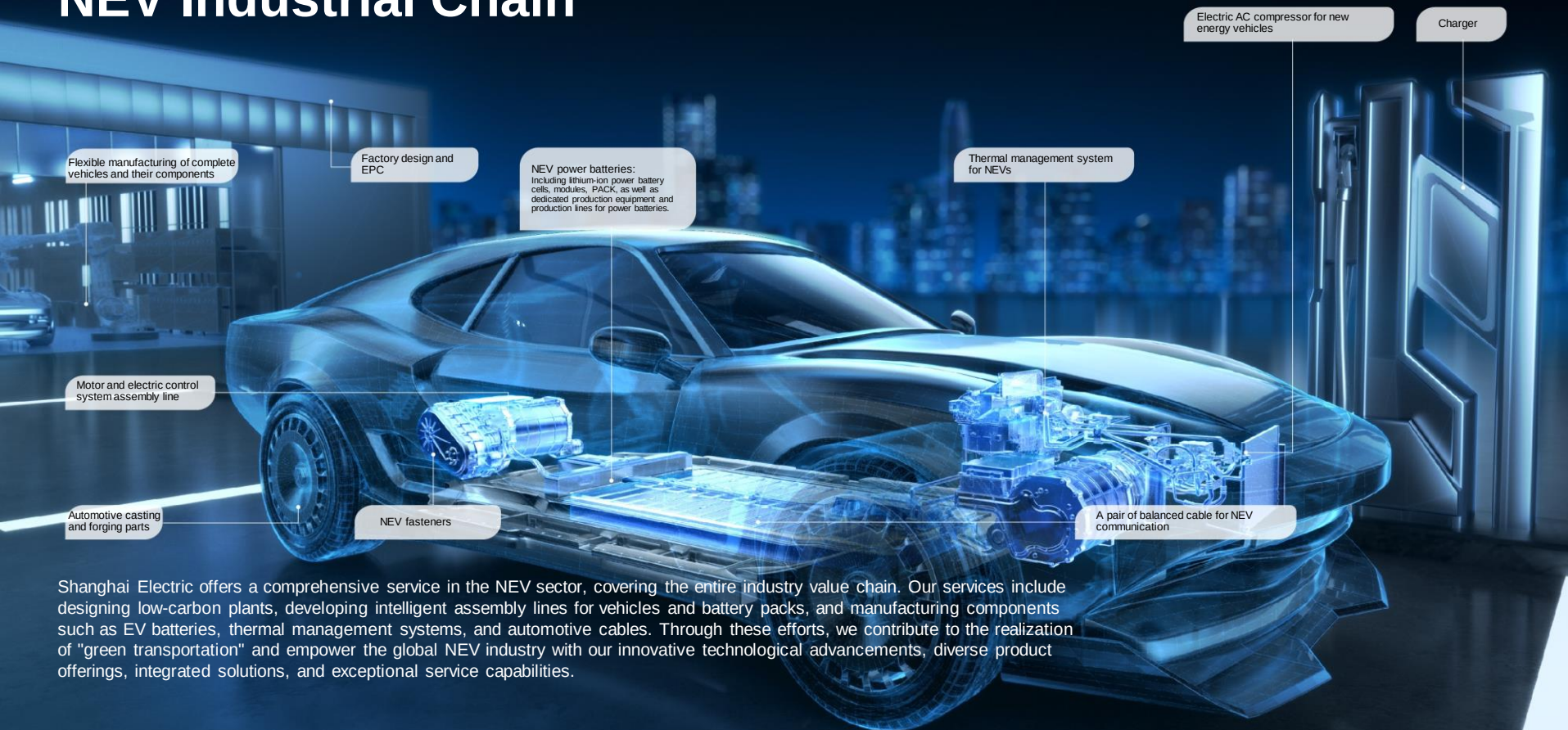
The incredible achievement of the Holon Building is made possible by BROAD Group's intelligent building factory. This factory specializes in 100% prefabricated modular buildings. With a total of 28 production lines and 46 sets of FANUC robots, the factory has the capacity to produce 60,000 houses annually.

DIGITAL INTELLIGENCE INTEGRATION

With its broad expertise in multiple industries, Shanghai Electric offers a comprehensive solution through digital-AI integration, which includes comprehensive solutions covering entire industry value chains in the large aircraft industry, such as final assembly lines, aviation blades, and aviation fasteners. They also provide solutions for new energy vehicles, including lithium batteries and smart factories, as well as EV batteries, automotive thermal management systems, and automotive fasteners. The company is also known for its excellence in the large ship industry chain, specializing in large marine crankshafts, large castings and forgings, steam turbines, and ballast water treatment. Using the independently developed SEunicloud Industrial Internet Platform, the group empowers industries to transform digitally.



NEV Industrial Chain



Shanghai Electric offers a comprehensive service in the NEV sector, covering the entire industry value chain. Our services include designing low-carbon plants, developing intelligent assembly lines for vehicles and battery packs, and manufacturing components such as EV batteries, thermal management systems, and automotive cables. Through these efforts, we contribute to the realization of "green transportation" and empower the global NEV industry with our innovative technological advancements, diverse product offerings, integrated solutions, and exceptional service capabilities.

NEV Industrial Chain



Upgrading project of BMW Brilliance's production site (Plant Lydia)

Body Assembly Line

Over 800 Fanuc robots for more accurate and efficient welding operations and preventive maintenance tasks

AI

AI-driven vision-based gripping

Cloud-based remote service system

Fanuc ZDT, a cloud-based remote service system

Digital twins

Developing digital twin models and building a factory featuring an authentic "industrial metaverse"

The C Company



1.6m Double Layer Extrusion Coater

Highlights:

Maximum roll surface width: 1,600 mm

Maximum coating speed: 120 m/min

First double layer extrusion coater with 1.6m roller surface in the industry

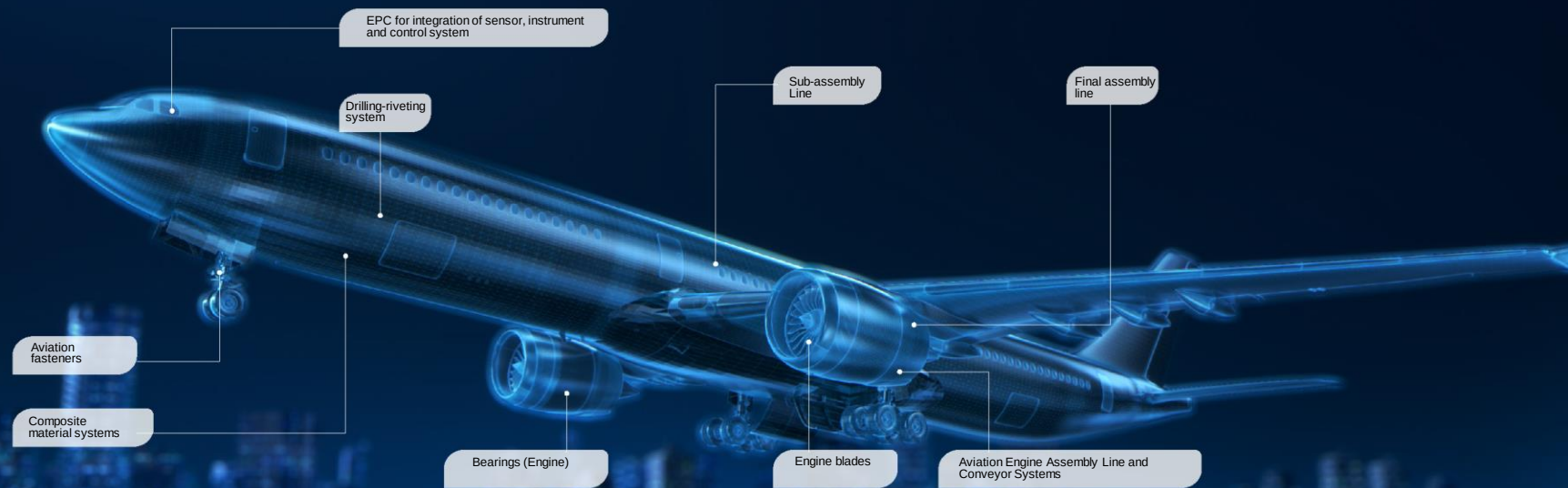
Setting industry benchmarks with our coating width and speed

VOYAH Dreamer's thermal management system

To meet the specific requirements of NEVs, an innovative indirect heat pump system with multiple unique patents has been implemented to significantly reduce energy consumption during winter heating. Additionally, the thermal management systems of the Battery Management System (BMS) and Motor Control Unit (MCU) have been integrated and optimized to ensure accurate control of thermal energy in the vehicle, enhancing cabin comfort and improving the safety of the BMS and MCU. Moreover, it contributes to reducing overall energy consumption.



Large Passenger Aircraft Industrial Chain



Shanghai Electric offers a range of essential products and integrated services for the aviation industry, including automated drilling and riveting systems, assembly lines, aircraft instrument control systems, aviation fasteners, engine blades, bearings, and other crucial subsystems and components. Shanghai Electric is leveraging its expertise in industrial equipment development and data application to make manufacturing become smart and make products more intelligent. Together with our customers, we are actively contributing to the advancement of China's aviation industry.

Large Passenger Aircraft Industrial Chain



Automated assembly line for C919 mid-fuselage section

Using a digital flexible docking system with 32 locators, Multi-Panel Assembly Cells (MPAC), and integrated assembly tooling, the C919 mid-fuselage assembly line was successfully delivered to COMAC as a turnkey project.



Airbus A220 automatic drilling and riveting machine project

The panel riveting equipment supplied by Shanghai Electric is recognized as one of the most efficient gantry-type MPAC systems globally. The machine is specifically designed for assembling the front fuselage, mid-fuselage, rear fuselage, and doors of Airbus A220 aircraft. As part of this advanced equipment, there is an electric-driven riveting system, as well as an intelligent fastener conveying system, as well as flexible fixtures that are designed to fit the particular product being manufactured. These features ensure that aircraft panels can be assembled quickly and precisely.



Boeing 777-X panel assembly project

Planning and engineering of factories based on assembly line programs

- 6 Multi-Panel Assembly Cells (MPAC)
- 3 sets of FRAC (Frame Riveter Assembly Cell)

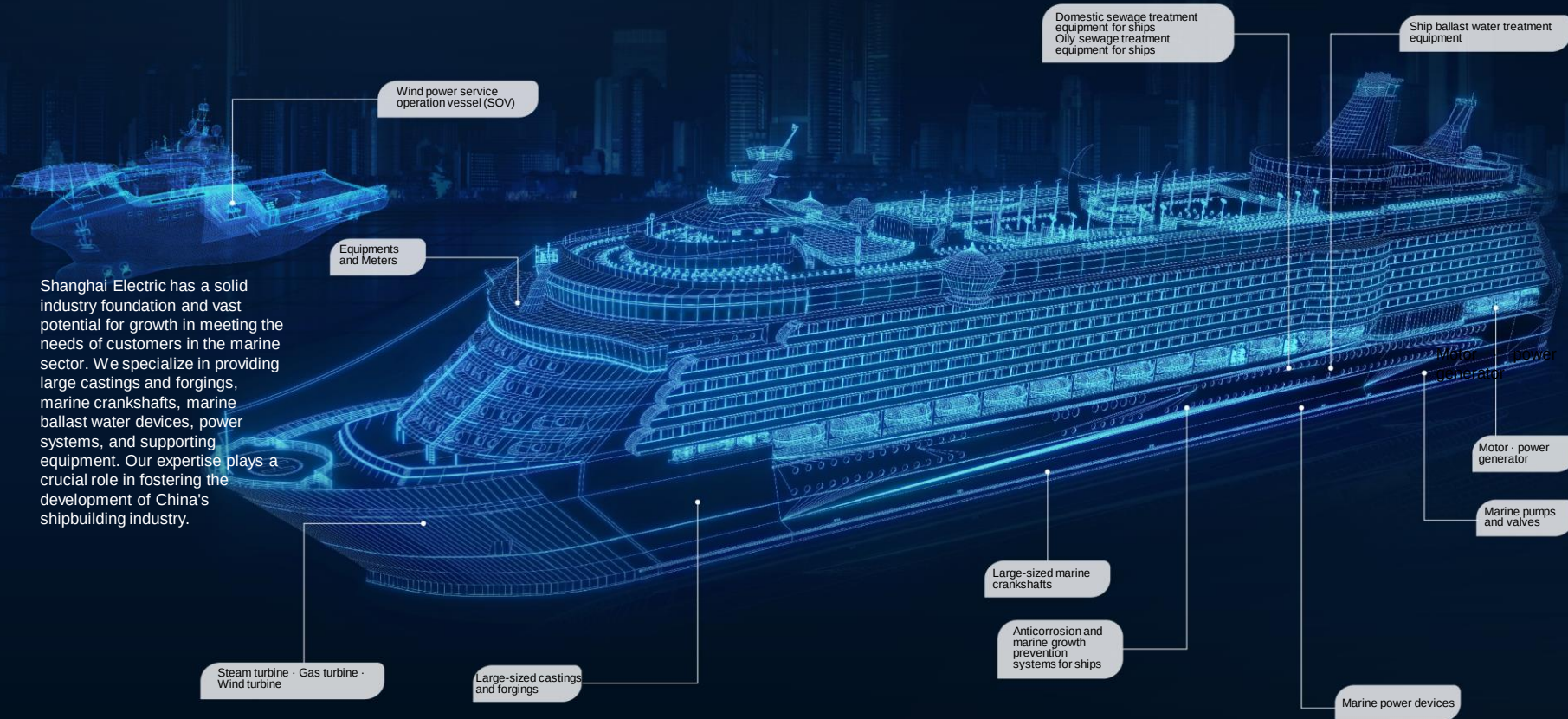
Digital twins of all machines and parts

- Broetje-Automation's OLPS V5 for offline programming
- Real-time simulation by CNC
- In-depth data collection



Contemporary Maritime Industry Chain

Shanghai Electric has a solid industry foundation and vast potential for growth in meeting the needs of customers in the marine sector. We specialize in providing large castings and forgings, marine crankshafts, marine ballast water devices, power systems, and supporting equipment. Our expertise plays a crucial role in fostering the development of China's shipbuilding industry.

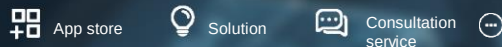


Digital Solutions --- Shanghai Electric's SEunicloud Industrial Internet Platform



Industrial Internet
platform

Industrial applications



Generic technology foundation

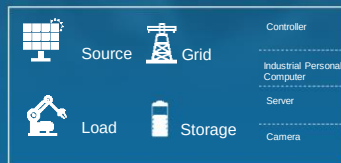
Technical Services

Cloud computing	AI	Digital twins	Big data	IoT
Industrial Visualization	Sign analysis	Low-code	AR/VR	...

Data Collection



Edge-side/Equipment-side



SCADA

MES

PMS



460,000 sets of equipment of various types under management

Assets worth RMB **154** billion

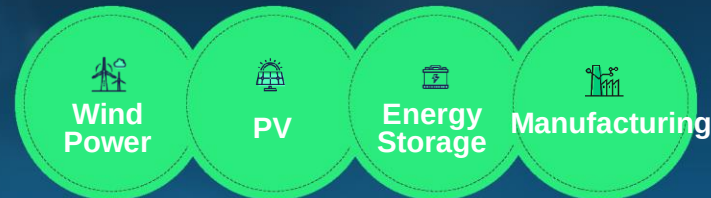
417 enterprises customers

300+ industrial APP

Solutions: **40+**

100+ industrial models

Typical application scenarios



OPEN, COORDINATED AND WIN-WIN COOPERATION

开放协同 合作共赢

我们携手全球合作伙伴 赋能产业高质量发展

 MITSUBISHI ELECTRIC Changes for the Better	 FANUC	 SIEMENS	 Danfoss	 ABB	 中电投集团	 中广核	 中广核 CGN	 首钢股份	 中国核电 CHNP
 富士电机 Fuji Electric	 KSB	 ANSALDO	 施耐德电气 Schneider Electric	 Carrier	 Acwa Power	 Nabtesco	 中航自控	 中国航发 AECCE	
 COMAC 中国商飞	 中国中车 CRRC	 中国工商银行 ICBC	 大唐集团 CHINA DATANG	 国家能源集团 CHN ENERGY	 招商银行 ZHONGYUAN BANK	 中阳建设集团 CHINA CONSTRUCTION GROUP	 JOHNSON ELECTRIC	 中国进出口银行 CIC	 HUAWEI
 清华大学 Tsinghua University		 申能 SHENHE	 宁德时代 CATL	 上汽集团 SAIC MOTOR	 NAN	 中德集团 ENNE	 COOPER		 AVE
 上海科创 SHANGHAI SC&TI	 VOITH Frigorated Technology	 Nakano	 山东电力 SPIC	 SINOPEC	 柳工 LIUGONG	 宝武集团 BAOWU	 上海建工集团 SCE	 青山控股 QINGSHAN INVESTMENT GROUP	 上海城投 SHANGHAI CHENGTOU

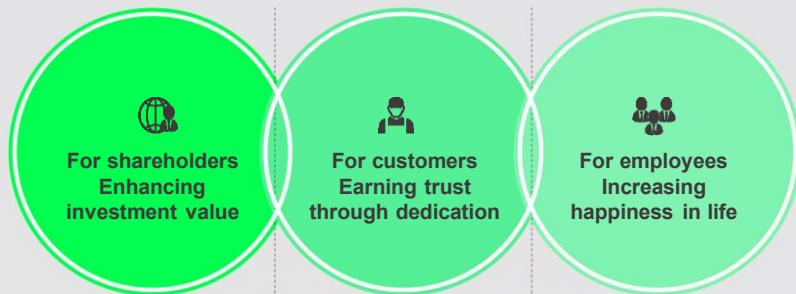
STEP 03



**SUSTAINABLE
DEVELOPMENT**



ESG Operating Models



INVESTOR	CUSTOMER	EMPLOYEE
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2022 Forbes China Top 50 Sustainable Development Industrial Enterprises

Online and in-person investor interaction

2022 Case Study Award for Exploration and Practice of Sustainable Development in China Industry

Maintaining customer satisfaction by delivering on quality promises

Customer-centric approach to creating sustainable customer value

Prioritizing information security and establishing a robust system to ensure customer confidentiality and data production

Listed in Forbes' list of World's Best Employers

Promoting workplace equality and diversity, with 42% of our management positions held by women

Dedicated to safeguarding employees' rights and protecting their interests

Priority placed on employee health and well-being as well as providing them with targeted assistance, supporting 5,244 employees in 2022 with a total expenditure of RMB 6.99 million.



PARTNER	ENVIRONMENT	PUBLIC
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Pursuing mutual benefit and win-win cooperation
Government-enterprise cooperation, school-enterprise collaboration, technological value co-creation
Industry-wide collaboration, global partnerships

Effective supply management to support sustainable growth
Supporting our partners throughout the supply chain in achieving high-quality yet sustainable development
Reduction of costs by 11.8%

GHG Emission Intensity: 278.5

tons of CO₂ equivalent / RMB 100 million operating income

EPis: 31,190.54

Total investment in environmental protection in the last three years. Unit: in 10,000 yuan

SEC-LOVE environmental management system

Shanghai Electric's biodiversity-themed campaign

Supporting rural revitalization

Assistance in revitalizing rural areas through partnering
Promoted the use of clean energy in northern China through the establishment of a green energy framework

Unwavering commitment to public services

Partnering with the University of Karachi to offer Chinese language classes
Contributing to a major breakthrough in China's underwater archaeology
Collaborating with Carbon Sink Foundation for afforestation projects

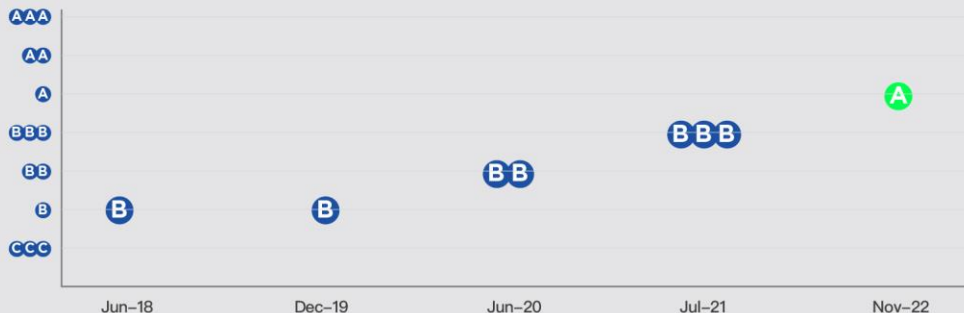
Shanghai Electric's first low-carbon forest on the west bank of the Yellow River in Yan'an, Shaanxi

Creating Sustainable Value Through Strengthening of ESG Management



A

In 2022, our MSCI-ESG rating was upgraded to A



NEWS 01



As a result of its excellence in green transition, Shanghai Electric won an award for Best Carbon Peaking & Carbon Neutrality Practice.

NEWS 02



Excellent Enterprises of 2022 for Sustainable Development

NEWS 03



"Best ESG Practice of the Year"

NEWS 04



Top 500 Chinese ESG Enterprises

Global Industries



China



State-owned listed companies in Shanghai





与创造者共创未来

CREATE OUR FUTURE TOGETHER

