

HHI

Abbreviation of Stock

601226

Ticker Symbol



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CHINA HUADIAN CORPORATION LTD.

华电科工股份有限公司

HUADIAN HEAVY INDUSTRIES CO., LTD.

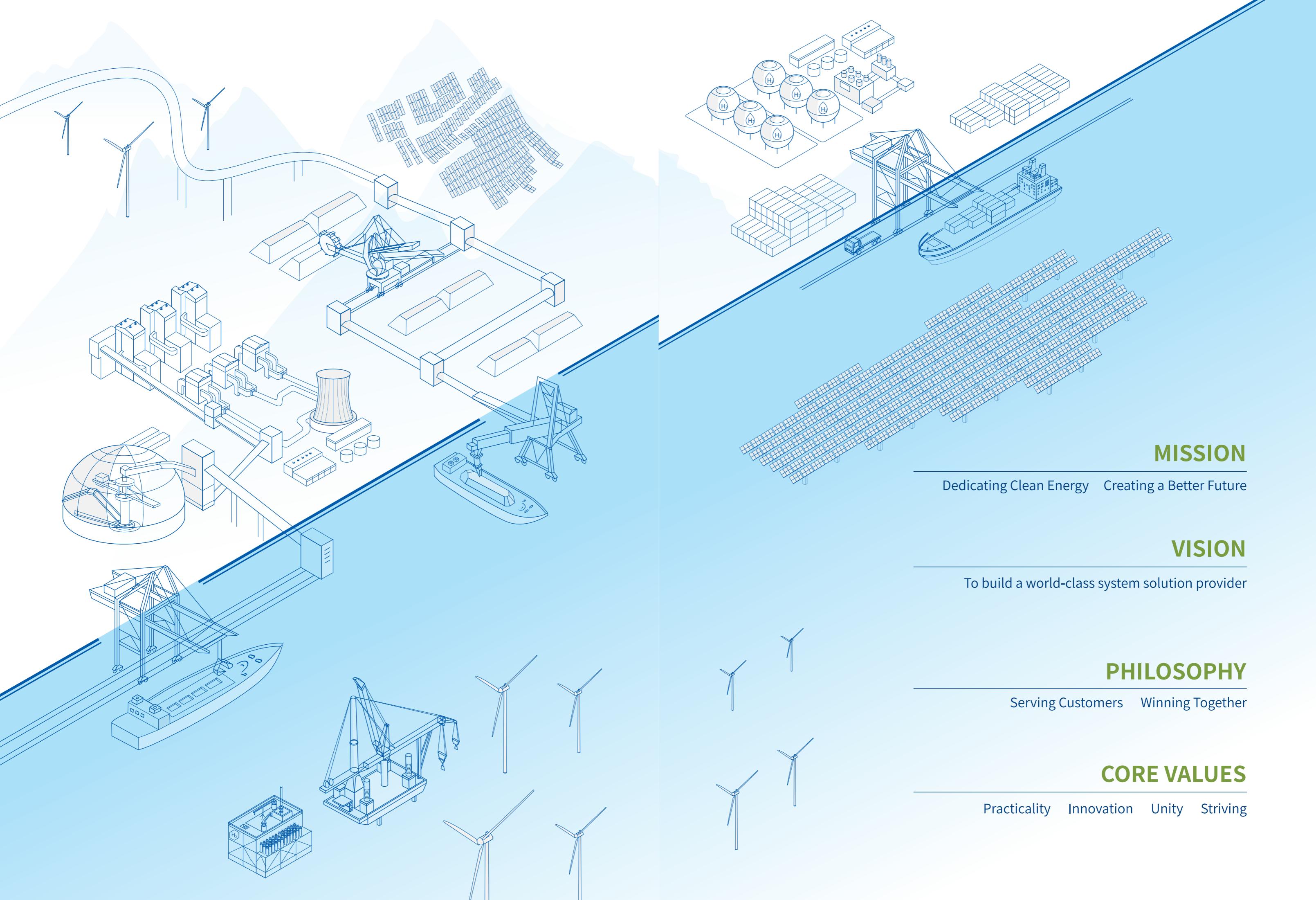


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MISSION

Dedicating Clean Energy Creating a Better Future

VISION

To build a world-class system solution provider

PHILOSOPHY

Serving Customers Winning Together

CORE VALUES

Practicality Innovation Unity Striving

01

ABOUT US

- Company Profile
- Organization
- Qualification & Honors

02

R&D

- R&D

03

BUSINESSES

- Material Handling System Engineering
- Thermal Engineering
- Steel Structure Engineering
- Noise Control Engineering
- Marine Engineering
- Hydrogen Energy Engineering
- Methanol & Ammonia Engineering
- Intelligent Ports Engineering

04

OVERSEAS ENGINEERING

- Overseas Engineering

05

EQUIPMENT MANUFACTURING

- Huadian Caofidian Heavy Industries Co.,Ltd.
(Caofidian Base)
- Huadian Heavy Machinery Co., Ltd.
(Tianjin Base)
- Wuhan Huadian Engineering Machinery Co., Ltd.
(Wuhan Base)
- Huadian (Bayannur) New Energy High-End Equipment Co., Ltd.
(Bayannur Base)
- Henan Huadian Jinyuan Piping Co., Ltd
(Zhengzhou Base)

06

TYPICAL ACHIEVEMENTS



CONTENTS

ABOUT US

01



COMPANY PROFILE

Huadian HeavyIndustries Co., Ltd. (HHI) is the core business sector and capital operation platform of China Huadian Engineering Co., Ltd.(CHEC), it also is an important part of the science and engineering industry of China Huadian Corporation Ltd.(CHD). HHI was founded in December 2008 with a registered capital of 1.166 billion RMB and successfully listed on the Shanghai Stock Exchange on December 11,2014(stock abbreviation: HHI: stock code: 601226)

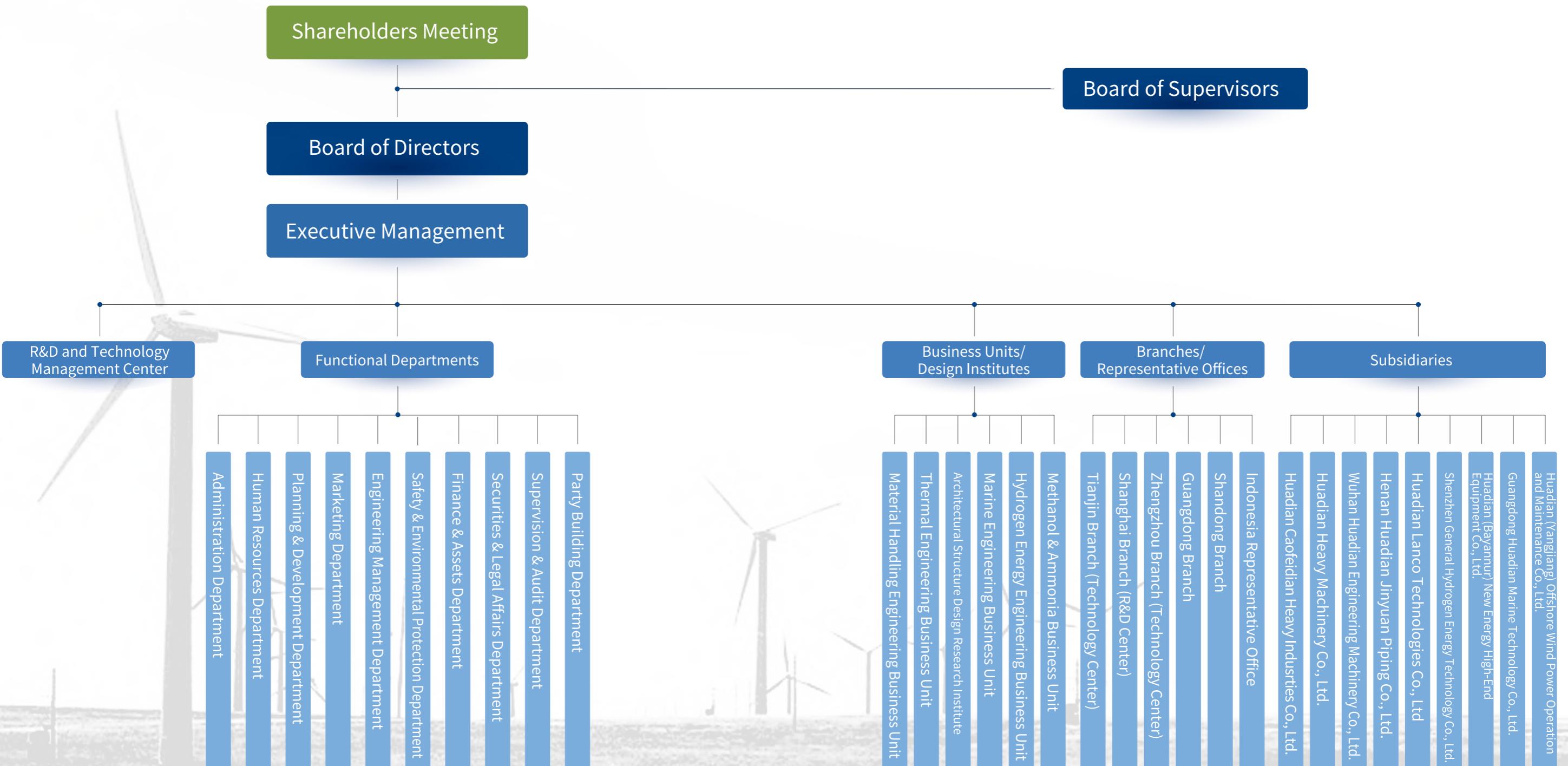
With system integrated technology taking the lead, EPC as business mode and supported by equipment manufacturing, HHI focuses on the coordinated development of EPC system engineering, equipment manufacturing and assets management. HHI is committed to providing the whole system solutions to the clients in material handling engineering; thermal engineering, steel structure engineering, industrial noise treatment engineering, hydrogen energy engineering, methanol&ammonia engineering and intelligent port machinery engineering, etc. HHI's business covers areas such as power, coal, petrochemical, mining, metallurgy, port, water conservancy, building materials and urban construction both domestic and abroad.

- Company Profile
- Organization
- Qualification & Honors

Philosophy —— Green | Intelligence | Safety | Efficiency



ORGANIZATION





QUALIFICATIONS & HONORS

QUALIFICATIONS



PATENTS



AWARDS



HONORS



O 2

R&D



R&D

Academician Workstation

Postdoctoral Workstation

9
Technology Centers

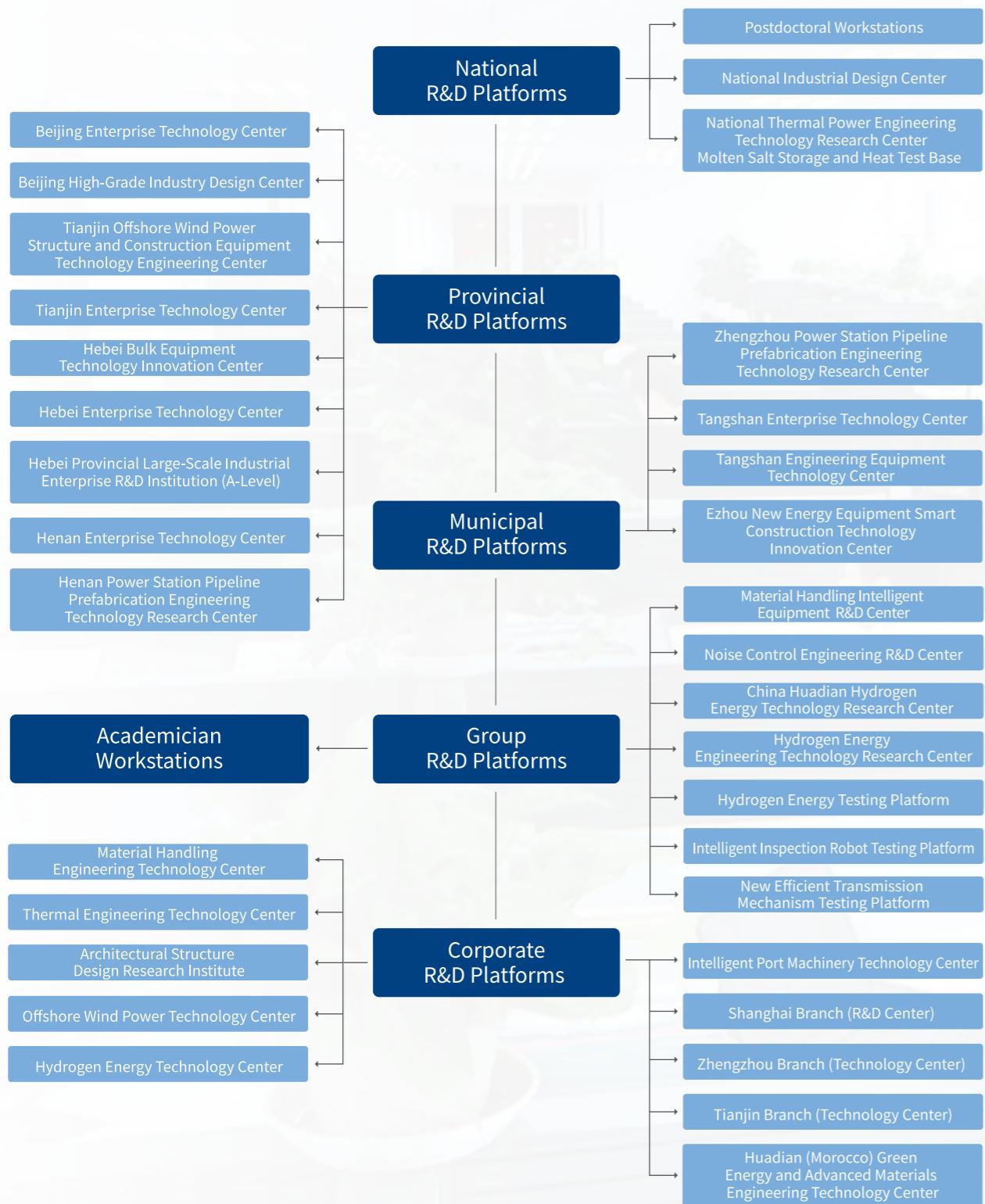
1366
Authorized Patents

236
Invention Patents

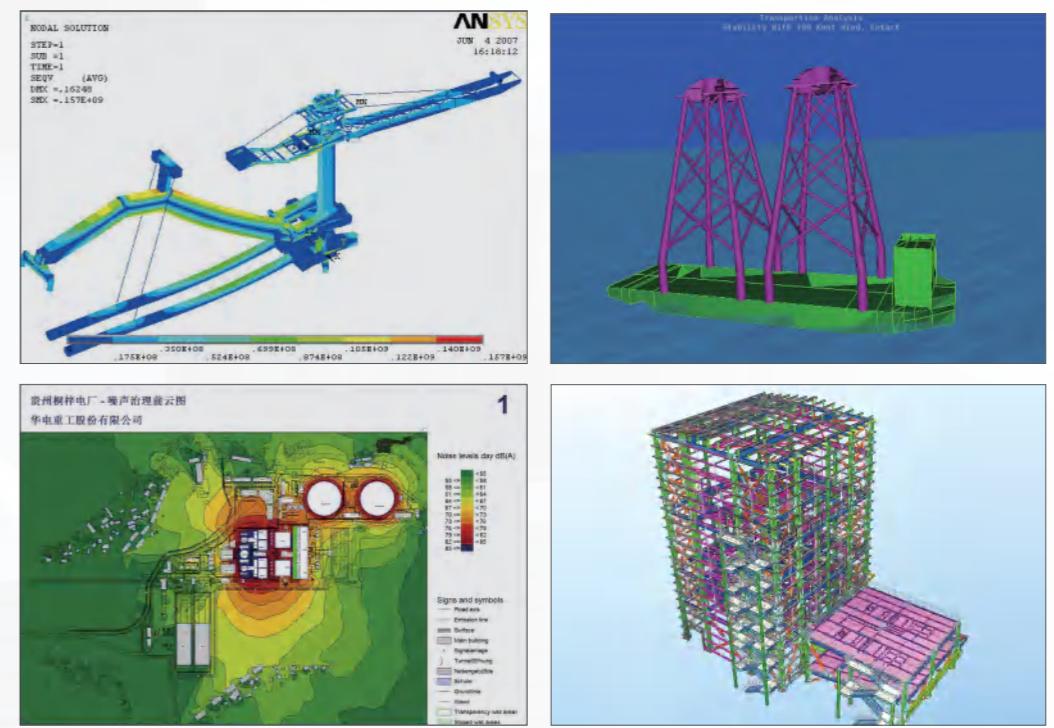
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Software Copyrights



R&D PLATFORMS



HHI has established several research facilities, including an Intelligent Material Handling Engineering Lab, a Large Equipment Remote Monitoring and Health Assessment Center, an Acoustic Lab, and a Digital Stockyard Simulation Center. These platforms enable the testing of key component parameters, remote operation and maintenance of system and large equipment, data collection, diagnostic analysis, data mining, as well as simulation and control system testing. HHI is also expanding its R&D and testing capabilities with the development of an Intelligent Inspection Robot Testing Platform, New Efficient Transmission Mechanism Testing Platform, Hydrogen Energy Testing Platform, Molten Salt Thermal Storage Lab, and High-Speed Belt Conveyor Testing Lab. These efforts provide a strong hardware foundation for advancing R&D and lifecycle technical services for key equipment. They also play a crucial role in fostering new quality productive forces, exploring innovative business areas, and driving the company's high-quality growth.



O3 BUSINESSES

- Material Handling System Engineering
- Thermal Engineering
- Steel Structure Engineering
- Noise Control Engineering
- Marine Engineering
- Hydrogen Energy Engineering
- Methanol & Ammonia Engineering
- Intelligent Ports Engineering



HHI has made great contributions to the green development in the fields of power, coal, petrochemicals, mining, metallurgy, ports, water conservancy, building materials, urban construction, etc. both domestic and abroad. HHI endeavors to be a world-class system solution provider in green production and development globally.



MATERIAL HANDLING SYSTEM ENGINEERING

With system R&D and EPC project as the focus, supported by the manufacturing of high-end equipment, and connected through a full lifecycle intelligent service platform, HHI provides digital, intelligent, energy-efficient, and environment-friendly material handling engineering system solutions for industries such as power, ports, metallurgy, oil, chemicals, coal, building materials, and mining. It is dedicated to becoming a world-class provider of material handling engineering system solutions.

HHI primarily engages in EPC projects for coal handling system in power plants, loading/unloading system at port terminals, solid material storage and conveying system in petrochemicals, conveyor system for metallurgy and mining, specialized material handling engineering system, and eco-friendly storage system. As the largest material handling engineering system solution provider in China, HHI has developed a core product lineup, known as the “4+5+1” series.



01 POWER PLANT COAL HANDLING SYSTEM

Power plant coal handling system is designed to transport coal to coal-fired power generation. The system is mainly composed of coal unloading, storage, conveying, screening, and crushing, and auxiliary systems. Large-scale material handling equipment includes wagon tipper, ship unloaders, stacker/reclaimers, belt conveyor, etc.



▲ Huadian Laizhou Intelligent Eco-Green Energy Base Project

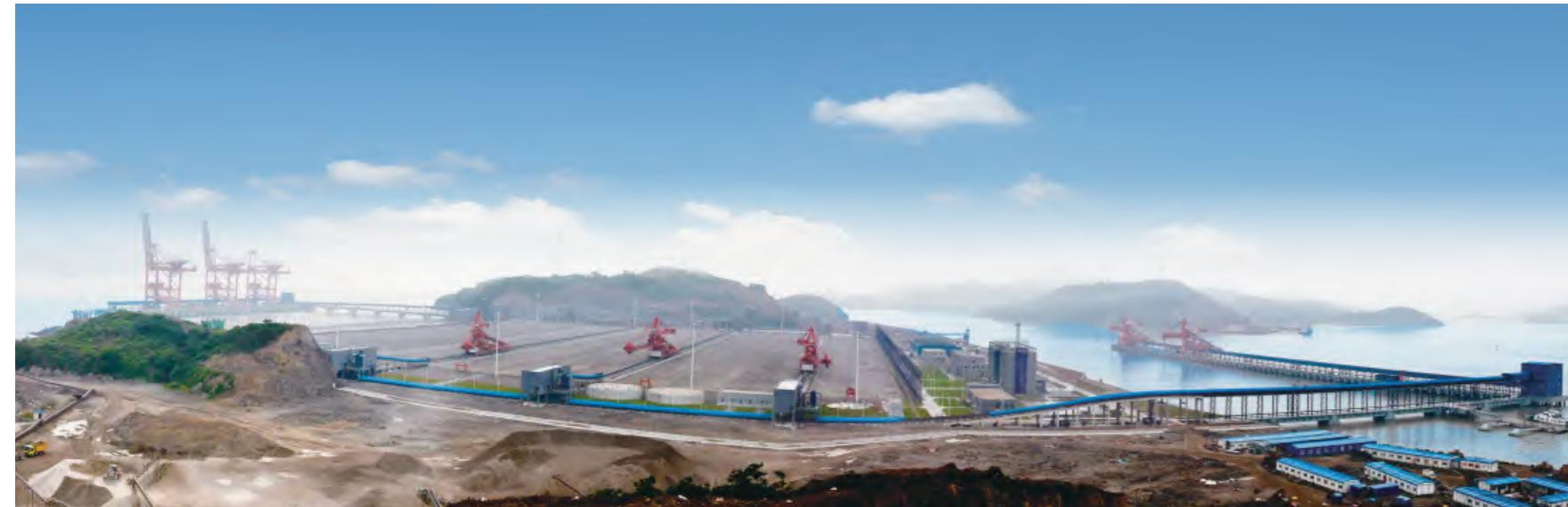
The project won the 2020-2021 National Quality Engineering Gold Award



▲ Coal Handling System of Celukan Bawang 3x142MW Power Station Project in Bali, Indonesia

02 PORT BULK MATERIAL HANDLING SYSTEM

Port Bulk Material Handling system is used for loading, unloading, storage, and conveying of bulk materials such as ores and coal at bulk cargo terminals. These system consist of ship loaders, ship unloaders, stacker/reclaimers, belt conveyors, transfer towers, trestle, and related electrical control, dust removal, fire fighting system,etc.



▲ EPC Project of Ore Handling System and Auxiliary Facilities for Zhejiang Zhoushan Wugang Terminal

03 ECO-FRIENDLY BULK STORAGE SYSTEM

The eco-friendly storage system, is used for bulk material stacking and storage. The system is featured less land occupation, excellent environmental performance, safe and reliable operation, and high automation. It has been listed in the Catalog of Environmental Protection Industries and Equipment (Products) Currently Encouraged by the State.

✓ EPC Project of Dome Stockyard Cluster at Xinjiang Baosteel

The facility features 11 dome stockyards, making it the largest dome stockyard cluster in China. Two of the stockyards, with a diameter of $\Phi 136.5m$, are among the largest in the world in terms of single-unit storage capacity and diameter.



04 OPEN-PIT SEMI-CONTINUOUS MINING SYSTEM

The open-pit semi-continuous mining system is used for stripping and mining in open-pit mines (including coal and metallurgical mines). The system consists of spreader, mobile belt conveyor, unloading car, cable car, power supply system, control system, etc.



▲ EPC Project of Ore Berth and Bulk Cargo Berth Storage Yard System at Jingtang Port



▲ Waste Rock Handling and Spreading System for 3Mt/a Mining and Dressing Expansion Project at Chongqing Taihe Iron Mine

05 SOLID MATERIAL STORAGE AND TRANSPORT UNITS FOR THE CHEMICAL INDUSTRY



▲ 1.2 Mt/a Fine Chemicals Project for Inner Mongolia Yitai Chemical Co., Ltd.,

The project includes processes such as unloading of raw coal and fuel coal at the plant, sampling, conveying, storage, transfer, screening, crushing, and metering.



▲ EPC Project of the 1 Mt/a Potash Chloride Packaging, Palletizing, and Cross-line Conveyor System at Qinghai Salt Lake

The packaging and palletizing system is used for bulk material packaging, stacking, and loading for industries such as chemicals and grain. It mainly consists of belt conveyors, bagging lines, palletizing robots, and related auxiliary system.

06 OVERLAND BELT CONVEYOR SYSTEM



▲ Yadong Cement Conveyor System Project in Jiangxi Province

The project uses bidirectional material transport technology.



▲ Belt Conveyor System for Boffa Bauxite Mine Project, Guinea

The project won the 2022-2023 National Quality Engineering Award.



▲ Chongqing Daye Long-Distance Downhill Belt Conveyor Project

This is the largest downhill conveyor project in China in terms of vertical height, with a drop of 400 m and a total length of 7 km. The first phase achieves a capacity of 3,300 t/h at a belt speed of 5 m/s. After technical upgrades in the second phase, capacity increased to 4,400 t/h. The system's peak power generation reaches 2,800 kW/h, with stable generation at around 1,800 kW/h under full load.



▲ Henan Hebi Heqi Power Plant Pipe Belt Conveyor System

The PC2 pipe belt conveyor is about 15,002 m long, with a designed capacity of 1,000/t/h and a pipe diameter of 400mm. The project was awarded the World's Longest Pipe Belt Conveyor by Shanghai China Records; 2017 China Power High Quality Engineering Award by CEP; World's Most Advanced Technological Achievement by China Heavy Machinery Industry Association.

07 CORE PRODUCT SERIES

▼ 4 Conveyor Equipments



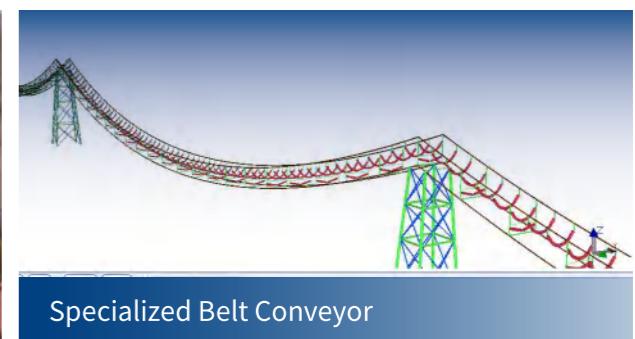
Pipe Belt Conveyor



Overland Belt Conveyor System



Movable Belt Conveyor



Specialized Belt Conveyor

▼ 5 Large-scale Equipments

Stockyard Stacker/Reclaimer Equipment



Bucket Wheel Stacker/Reclaimer



Dome Stockyard Stacker/Reclaimer



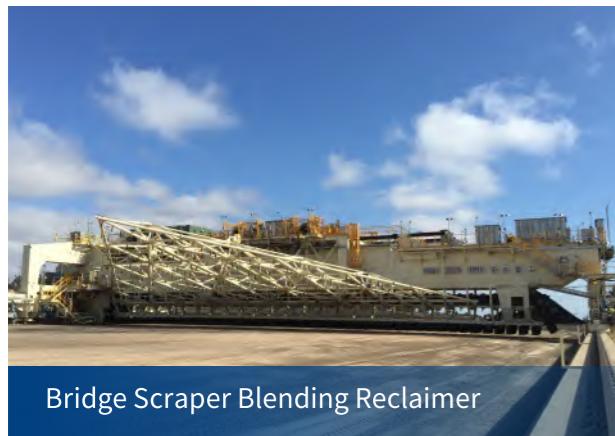
Portal Scraper Stacker/Reclaimer



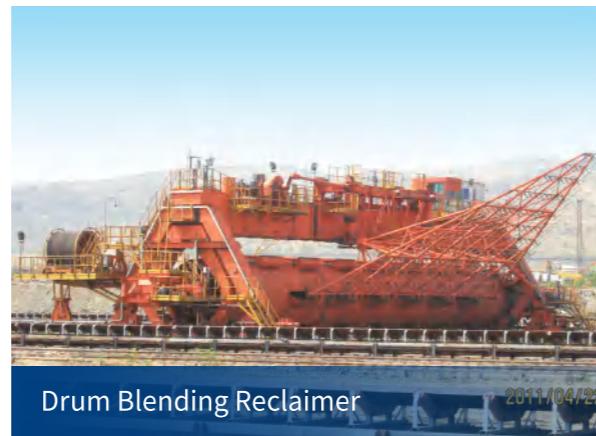
Twin-boom Stacker

07 CORE PRODUCT SERIES

Blending & Reclaiming Equipment

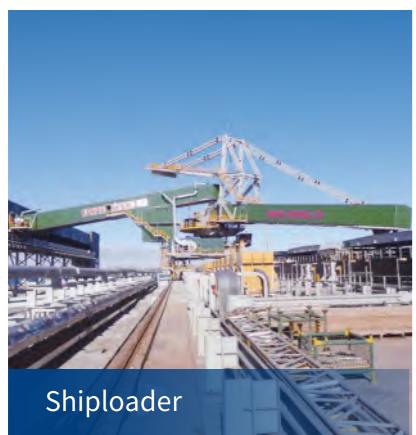


Bridge Scraper Blending Reclaimer



Drum Blending Reclaimer

Loading & Unloading Equipment



Shiploader

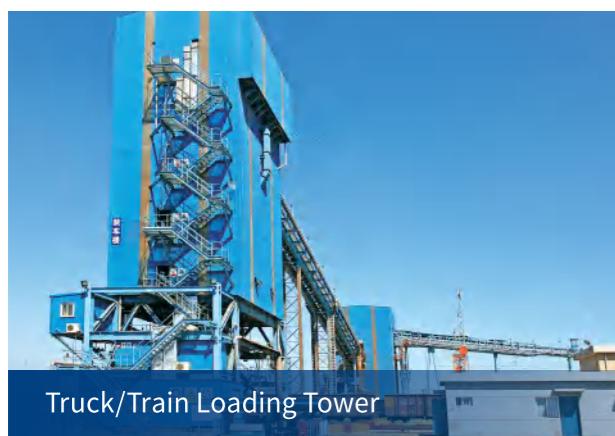


Grab Ship-unloader



Screw Ship-unloader

Loading Equipment



Truck/Train Loading Tower



Single, Double, Triple, and Quadruple wagon tipper

07 CORE PRODUCT SERIES

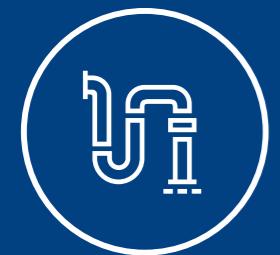
Spreader



▼ 1 Platform: Full-Lifecycle Intelligent Service Platform

The Full-Lifecycle Intelligent Service Platform consists of three main functional modules: the Large Equipment Lifecycle Management Center, the Equipment Cloud Service Center, and the Big Data Analysis and Mining Center. It enables remote monitoring, fault diagnosis, fault warning, and health assessment services for equipment.





THERMAL ENGINEERING

01

Power Plant
Piping System

HII ranks among the leaders in thermal power plant sector for its package supply capability and market share of critical piping system. The company has provided four major pipe products and services to more than 50% of domestic 1000MW ultra-supercritical units. With records of supplying six major pipes to lots of 1000MW double reheat units, HII is one of the few domestic suppliers with both pressure piping design qualifications and design capabilities for the package supply of critical piping system.

03

Comprehensive Efficiency
Improvement and Flexibility
Retrofit for Thermal
Power Plants

HII is actively involved in the development of new electricity system, with a focus on molten salt energy storage applied for flexible and deep peak-regulating operation of thermal power plants, as well as molten salt energy storage and gravity energy storage solutions for the construction of large-scale clean energy base.

HII offers tailored, unit-specific solutions based on "System Optimization, Equipment Efficiency Improvement, and Operational Optimization", provides customers with targeted "one-unit-one-solution" system solutions in accordance with the steps of "Plant-wide Diagnostics, Solution Development, and Project Implementation", thus reducing coal consumption in thermal power plants while enhancing the operational flexibility.

02

Air-Cooling System
(Including direct cooling
and indirect cooling)

04

New-Generation
Large-Capacity
Long-Duration Energy
Storage Technology

HII specializes in research, design, supply, installation, commissioning, and general contracting of piping system and air-cooled system, and provides all-round solutions for operational efficiency improvement, energy saving and flexibility retrofit of units in service. The company business scope covers thermal power, nuclear power, petrochemicals and coal chemical industry. With engineering design and project management at its core, and production and manufacturing as its foundation, HII actively participates in domestic and international market competition, and commits to provide customers with comprehensive services and solutions.

With the ability to design thermal system, piping system, and air-cooling system for power plant, HII is capable of providing technical and economic analysis for improving the efficiency of power units, numerical simulation of pipeline flow and heat transfer, numerical simulation of air-cooling islands, and related engineering design and technical services. HII holds GC1 and GCD grade pressure piping design qualification certificates and ASME certificate.

01 FOUR MAJOR PIPE SYSTEM OF POWER PLANT

Four major pipe system refers to the main steam pipe, hot-reheat pipe, cold-reheat pipe and main feed-water pipe and related bypass pipes that connect boiler and steam turbine. It is an important auxiliary system for thermal power plants and conventional island of nuclear power plants.



▲ Shanghai Waigaoqiao Phase III 2×1000MW Ultra-
Supercritical Units



▲ Huadian International Zouxian Power Plant Phase IV
2×1000MW Ultra-Supercritical Units



◀ Huadian Jurong Phase II 2×1000MW
Expansion Project



The project marks the first ultra-supercritical 1000MW unit of CHD applying double reheat technology. Unit 4 of the project was awarded national demonstration project for domestically manufactured power generation equipment. HII undertook the supply of six major pipe system, prefabrication and installation guidance. The project won China Power High Quality Engineering Award by CEP.

02 AIR-COOLING SYSTEM OF POWER PLANTS

Air-cooling system, mainly applied to fossil-fueled power and chemical industry, is a heat exchange system that uses natural air to cool down exhaust steam or circulating cooling water and is able to improve water saving capacity of coal-fired or combined cycle power plant.



◀ The Direct Air-Cooling System (ACC-1) of Xuangang Power Plant 2×660MW Ultra-Supercritical Units for Shanxi Tonghua Power Co., Ltd.



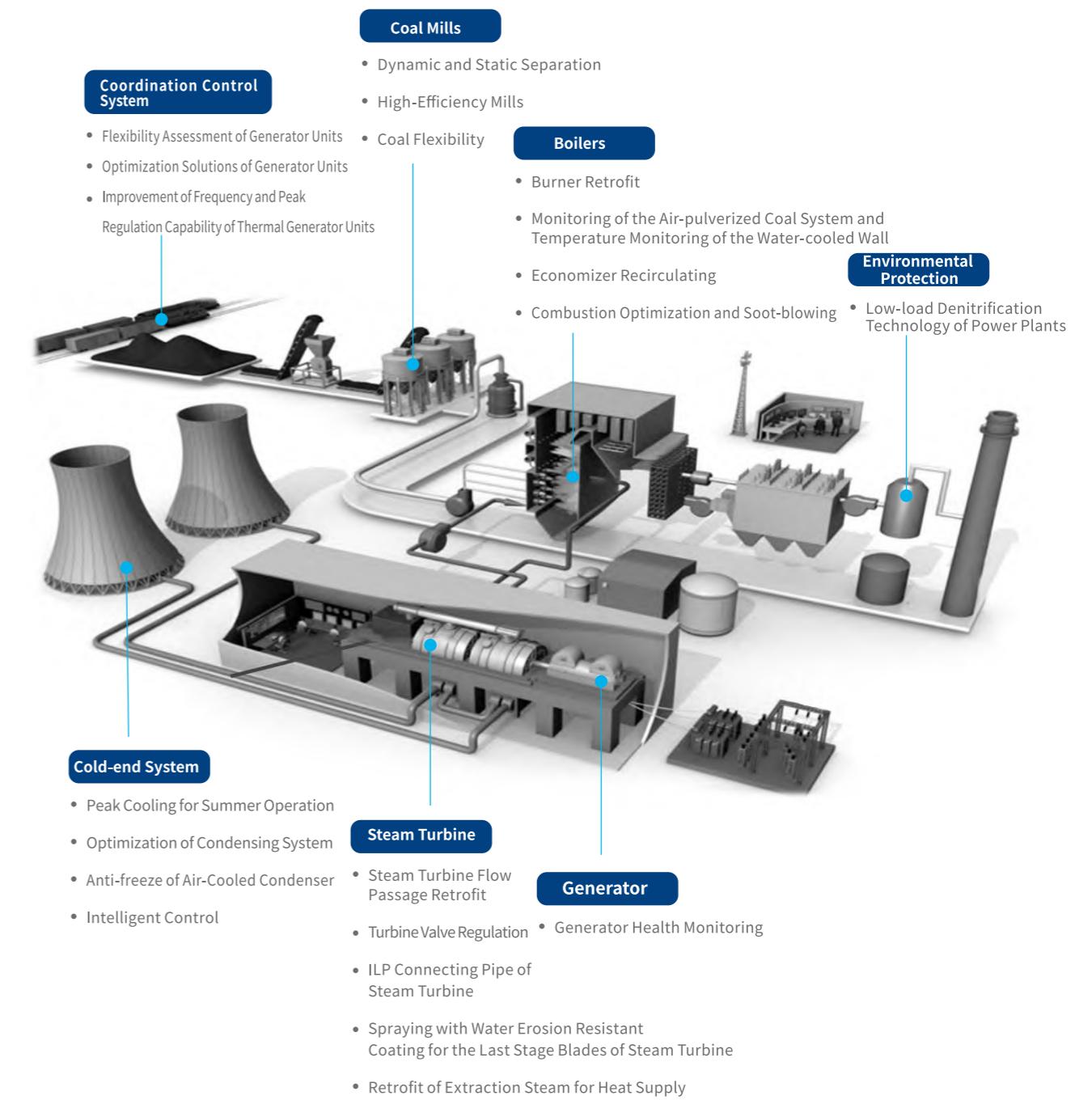
◀ Mechanical Draft Indirect Air-cooling System for 2×660MW Low-Calorific Value Coal Power Generation Project of Zhangzi Gaohe in Lu'an, Shanxi



◀ EPC Project of Steel-structured Indirect Cooling Tower for Xinjiang Huadian Hami 2×1000MW Coal-fired Power Project

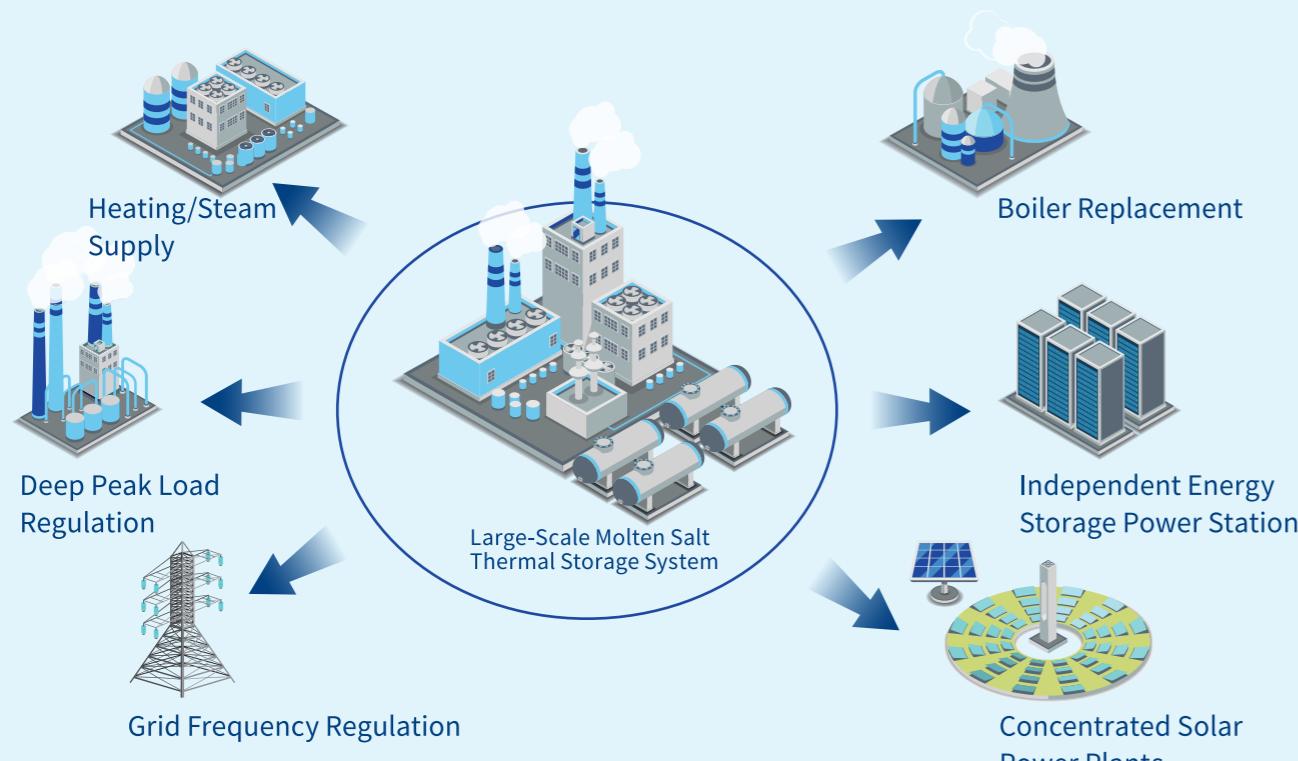
03 COMPREHENSIVE ENERGY EFFICIENCY IMPROVEMENT AND FLEXIBILITY RETROFIT FOR THERMAL POWER UNITS

By deeply engaging in the upgrading business of thermal power units, HHI has cultivated a highly specialized and experienced team in R&D and project execution of the field. The team has obtained extensive experiences and technical advantages in terms of power plant thermal system optimization, steam turbine flow passage retrofit and safe operation under low-load, boiler air-flue gas system optimization and low-load stable combustion, peak cooling for air-cooling system, and heating system upgrades. HHI has successfully completed energy efficiency enhancements and flexibility retrofits for a number of 300MW and 600MW thermal power units.

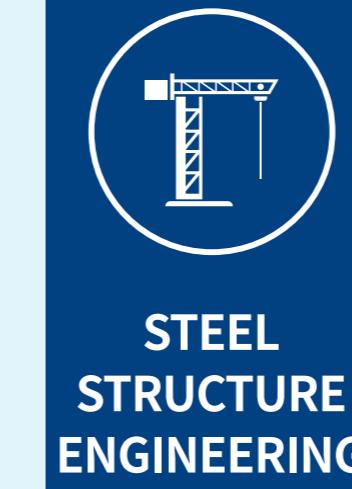


04 NEW-GENERATION LARGE-CAPACITY LONG-DURATION ENERGY STORAGE TECHNOLOGY

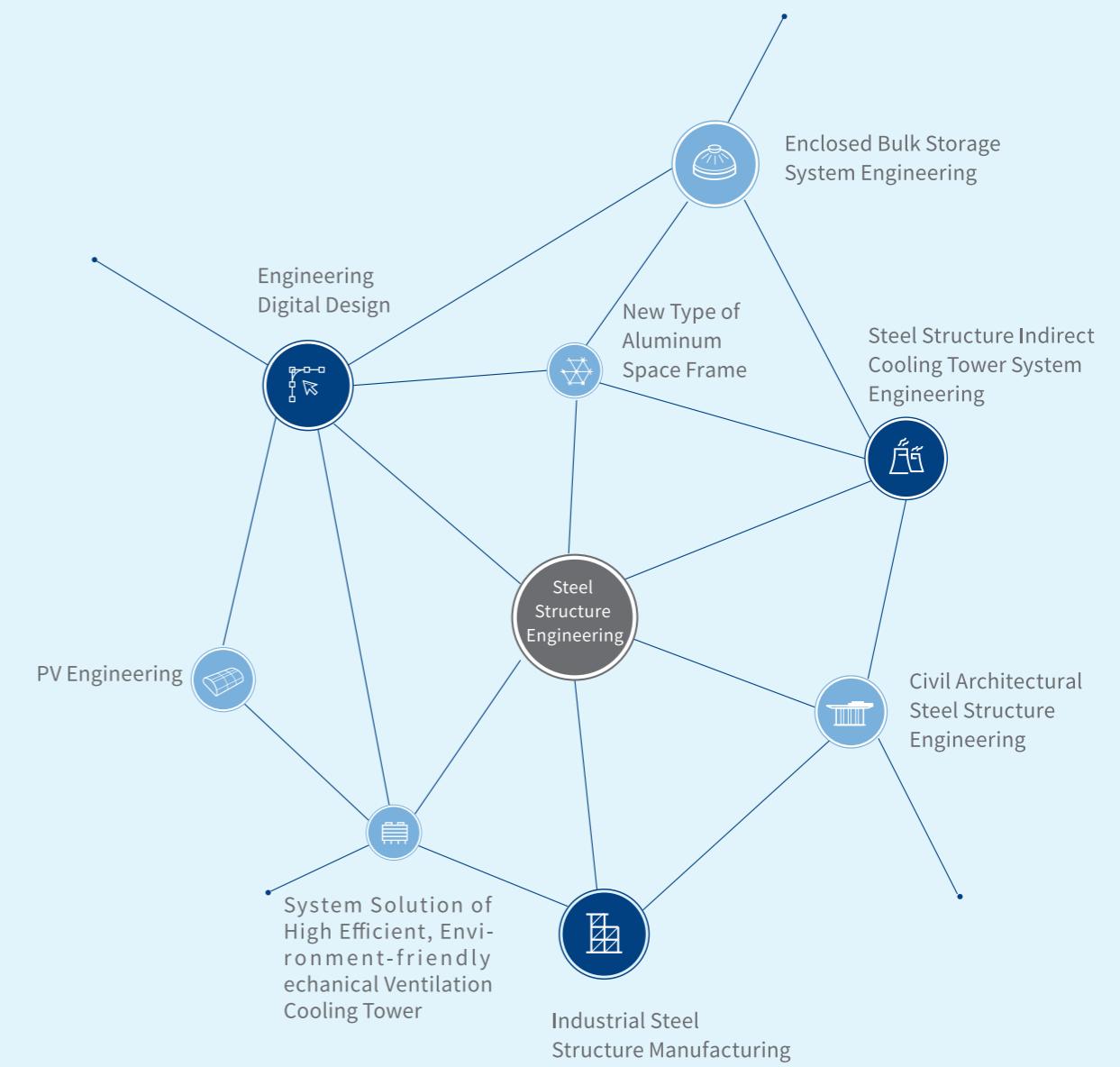
HHI is engaged in flexible and deep peak regulation for thermal power units based on molten salt energy storage technology. By developing molten salt energy storage technology, manufacturing key equipment, and undertaking general contracting of system project, HHI further unlocks the flexible and deep peak regulation potential of thermal units, enabling the decoupling of boilers, turbines, and heating system, and thus achieving grid connectivity with zero-output. The molten salt thermal storage test platform, fully developed, designed, built, commissioned, and operated by HHI, was launched on December 27, 2024. As the first multi-scenario molten salt thermal storage test platform in China, it has been successfully approved as a common technology platform project by Beijing Municipal Science & Technology Commission.



HHI is advancing the development and engineering application of gravity energy storage technology, which encompasses advanced trajectory algorithms, computer vision, materials science, modular structural design, and material conveying. HHI has established an intelligent megawatt class gravity energy storage system design solution with economic efficiency, safety, reliability and environmental sustainability.



As one of the earliest Chinese enterprise for steel structure design and manufacturing, HHI has been delivering detailing design, processing and manufacturing of steel structure since 1980s. HHI has now growing into a leading solution provider of steel structure engineering in China, offering services like system design, technology developement and EPC to clients in such industries as power, chemicals, metallurgy, mining, and civil buildings around the world.



01 ENCLOSED SYSTEM ENGINEERING FOR BULK MATERIAL STORAGE



▲ Huadian Tuyou Power Plant Coal Yard

The coal yard has a span of 192m, a length of 242m, and an area of 46,464 m², with a coal storage capacity of 6.29t/ m². With single-span prestressed pipe truss arch structure, the project has won Gold Award of Spatial Structure Design and Gold Award of Chinese Construction Engineering Steel Structure.

02 NEW TYPE OF ALUMINUM SPACE FRAME

The new type of aluminum space frame with hub-shape joints, originally developed from North America, has been successfully applied in more than 25 countries and regions. HHI has exclusively introduced the design, fabrication, and installation technology for this new technology, and improve to meet Chinese design standards. With these efforts, HHI is able to devise a whole solution for long-span structure, featuring advanced technology, reliable and safe operation and cost-effectiveness.



▲ Coemin Concentrating Plant in Chile

03 STEEL STRUCTURE INDIRECT COOLING TOWER SYSTEM ENGINEERING



▲ Huadian Tuyou Power Plant Steel Structure Cooling Tower

With a height of 124 m, this tower is the first steel structure cooling tower in China. It won the second prize for Scientific and Technological Advancement from CHD.



▲ Huadian Hami 2×1000MW Powe Plant Steel Structure Cooling Tower

With a height of 210 m, the largest and tallest steel structure cooling tower both in China and internationally. It marks the first application of a hyperbolic steel cooling tower in a 1,000 MW thermal power unit.



▲ Huadian Hami 2×350MW Steel Structure Cooling Tower

With a height of 160 m, this tower is the first ultra-large hyperbolic steel structure cooling tower in China. It has won the first prize for Scientific and Technological Advancement and the Steel Structure Gold Award from CHD.



▲ Cooling System EPC Project of Huaneng Gansu 1 Million Ton CCUS Project

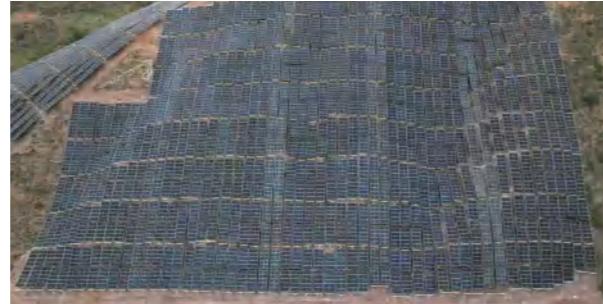
With a height of 142 m, this tower features a three-tower integrated design. It is the world's first hyperbolic steel structure cooling tower applied in CCUS (CO₂ Capture, Utilization, and Storage).

04 SYSTEM SOLUTION OF HIGH-EFFICIENT, ENVIRONMENTALLY-FRIENDLY MECHANICAL VENTILATION COOLING ISLAND TOWER

The HHI high-efficiency, environmentally friendly mechanical ventilation cooling island system solution integrates an optimal system design approach encompassing "heat transfer, fans, noise reduction, and architecture." It offers advantages such as high cooling efficiency, low energy consumption, water conservation, low noise, effective fog removal, and low operational costs.



05 PV ENGINEERING



▲ Mountainous PV Power Station / EPC Project of PV Area of Zhejiang Huadian Jinhua Pan'an 100MW PV Power Generation Project

The project uses a flexible support structure with a layout that follows the slope, with the bottom edge of the modules 2.5 m above the ground. The span is maintained between 18-40 m, utilizing 652 acres of mountainous land to install 62.5MW of PV capacity.

The project creatively uses drones for the transportation of modules and steel structure components, as well as for construction assistance, improving construction efficiency by appr. 30%.



▲ Rooftop Distributed PV / Rooftop Distributed Project of Tianjin Heavy Industry Machinery

Tailored solutions for commercial buildings and residential rooftops, achieving a harmonious integration of PV power generation and architectural aesthetics.

▲ Fishing-PV Hybrid System / New Energy Demonstration Base Project of Shanghai Datun Energy Co., Ltd.

This project combines the PV industry with aquaculture, achieving synergies between water-based power generation and underwater aquaculture, contributing to energy savings, emission reductions, and supporting rural and business energy transformation and green development.



▲ Tengger Desert 1000MW PV Power Generation Project, Inner Mongolia

The Huadian Tengger New Energy Base Project is a large-scale wind and PV base located in the "Desert-Gobi-Sandland" area of Alxa City. The PV pilot project is planned for one million kilowatts, with integrated energy storage and simultaneous ecological management, leading the way in green development.

At an altitude of 4,200m, this innovative project adopts a water-PV hybrid model, working with the Lizhoushui Hydroelectric Station to stabilize the grid. After commissioning, the project is expected to generate 180 million kWh annually, saving 54,000 t of coal per year and reducing carbon emissions by 147,000 t, with significant ecological benefits.

06 INDUSTRIAL PROJECT STEEL STRUCTURE MANUFACTURING



▲ Steel Structure of Air-Cooling System of Unit 4 of Lingwu Power Plant

▲ Huadian Huitengxile Wind Farm Wind Turbine Tower

07 CIVIL CONSTRUCTION STEEL STRUCTURE ENGINEERING

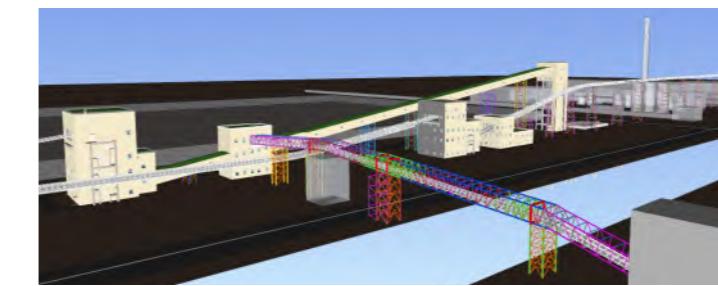


▲ Shijiazhuang LeTai Commercial Center

▲ Yichun High-Speed Rail Station Building

08 ENGINEERING DIGITAL DESIGN

HII leverages digital and intelligent technologies throughout the entire project lifecycle, facilitating interdisciplinary collaboration during the design and construction phases. These technologies also provide a solid material data foundation for enterprise management.



▲ Huajin United Petrochemical Fine Chemicals and Raw Material Engineering EPC Project for Coal, Petroleum Coke, Ash Storage and Conveying System

This project incorporates 3D collaborative design across disciplines including process, architecture, structure, electrical, and water supply and drainage. It integrates the information generated during the design, procurement, and construction phases, forming a digital twin based on the factory object at the core, to support intelligent applications during both the construction and operational phases.

▲ Wenling Eastern Shitang Fishery-PV Hybrid Power Station Project

This project features a smart, digitalized construction site supported by an integrated IoT sensing network. Data is transmitted to a cloud-based management platform for coordinated control of personnel, equipment, materials, methods, and environmental resources. It supports visualized management throughout the construction process and enables real-time monitoring, early-warning alerts, and full-process automation from planning to execution.



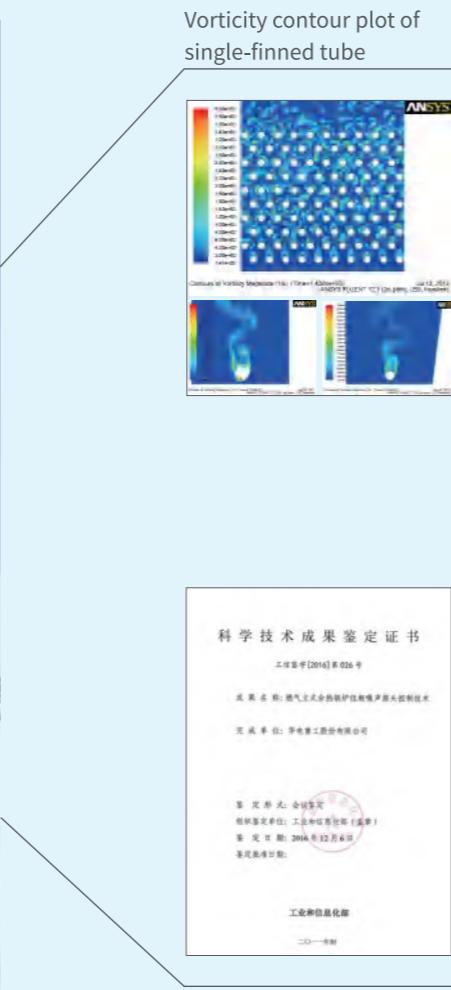
NOISE CONTROL ENGINEERING

HHI holds a Class-A Environmental Engineering Design Qualification, with over a decade of experience in noise control projects, provides clients with professional, scientifically-based, and cost-effective comprehensive noise control solutions and high-quality noise control products. HHI offers an integrated service package, including site testing, consulting, solution design, construction drawing design, product design and manufacturing, installation, commissioning, and acceptance. HHI's services extend across industries such as power, petrochemicals, construction, and municipal conveying. To date, HHI has completed over 50 large-scale noise control projects, many of which have been honored with the National Quality Engineering Award and the China Power Quality Engineering Award.

HHI has independently developed "Gas-Fired Power Plant Low-Frequency Noise Source Treatment Equipment," which has been recognized twice in the "Noise and Vibration Control" category of the "National Encouraged Environmental Protection Technology and Equipment Catalog," jointly published by the Ministry of Industry and Information Technology, Ministry of Science and Technology, and Ministry of Environmental Protection.



▲ Noise Control and Reconstruction Project Phase I for Shanghai Fengxian Fuel Machine Power Generation co., Ltd.



▲ Deindustrialization Project for Hangzhou Huadian Banshan Power Co., Ltd.

The project integrates with CHD's key scientific research initiative, "Research and Application of Power Plant Noise Control Technology." Alongside project construction, a series of technological R&D efforts were completed, including: Establishing a comprehensive database of power plant noise sources; Developing source-control technologies for power plant noise; Innovating key technologies for noise control in mechanically ventilated cooling towers; Advancing integrated noise mitigation and building structure solutions, which have resulted in a series of proprietary technologies and products for power plant noise control.



◀ Noise Control Engineering of Huadian Guangzhou Zengcheng Gas-Fired CCHP Project

This project adopts a 2×600MW-class gas-steam combined cycle cogeneration unit, integrating industrial steam, heating, electricity, cooling, and hot water into a unified energy system. By optimizing energy utilization, it achieves a cascading and efficient use of high-quality energy resources, significantly enhancing overall energy efficiency. The project was awarded the National Quality Engineering Award for 2022-2023.



▶ Shanghai Fengxian Nanqiao New Town Energy Center Noise Control Engineering Project

This project is part of Shanghai's "12th Five-Year Plan" for energy development and a major project for Shanghai and Fengxian District. It includes the construction of two 430MW-class gas-steam combined cycle cogeneration units along with supporting heat network infrastructure. The project received the National Quality Engineering Award for 2016-2017.

01 OFFSHORE WIND POWER ENGINEERING

HHI's offshore wind power business encompasses a comprehensive range of services, including design of offshore wind farm; manufacturing of steel pipe pile foundations, jacket structures, wind turbine towers and auxiliary structures; construction of wind turbine foundations; installation of wind turbine units and towers; manufacturing and installation of offshore substations; submarine cable laying; scour protection for foundations; offshore wind farm operations.



▲ CPI Binhai North H1# 100MW Offshore Wind Power Project

Awarded the 2017 China Quality Power Project Award and the 2016-2017 National Quality Engineering Gold Medal, the first offshore wind project in China to receive this prestigious recognition.

01 OFFSHORE WIND POWER ENGINEERING



▲ CTG New Energy Guangdong Yangjiang Yangxi Shaba 300MW Offshore Wind Power Construction Project



▲ Guoneng Yancheng Dafeng H5# 200MW Offshore Wind Farm Project



▲ Huadian Fuqing Haitan Strait 300MW Offshore Wind Farm Project



▲ Huadian Zhejiang Taizhou Yuhuan Phase I 300MW Offshore Wind Power EPC Project



▲ SPIC Shenquan Phase I 400MW Offshore Wind Farm Project



▲ HCIG Tangshan Laoting Puti Island 300MW Pilot Offshore Wind Farm Demonstration Project



▲ SPIC Shandong Peninsula South 3# Offshore Wind Power EPC Project



▲ Huaneng Sheyang Offshore South H1# 300MW Offshore Wind Power Main Construction Project

02 OFFSHORE PV AND MARINE RANCHING

HHI is actively engaged in the development of offshore PV and marine ranching projects by leveraging innovative fixed-type PV structure system, advanced floating PV system, high-efficiency, cost-effective construction methods, techniques, and equipment. By integrating offshore wind power with marine ranching and offshore tourism, HHI is pioneering new models for the synergistic development of marine energy and marine industries.



▲ Huadian Zhejiang Wenling Shitang 200MW Tidal Flat PV Power Project



▲ SPIC Jieyang Marine Ranching Heavy-Duty Legged (Truss-Type) Net Cage Pilot Project

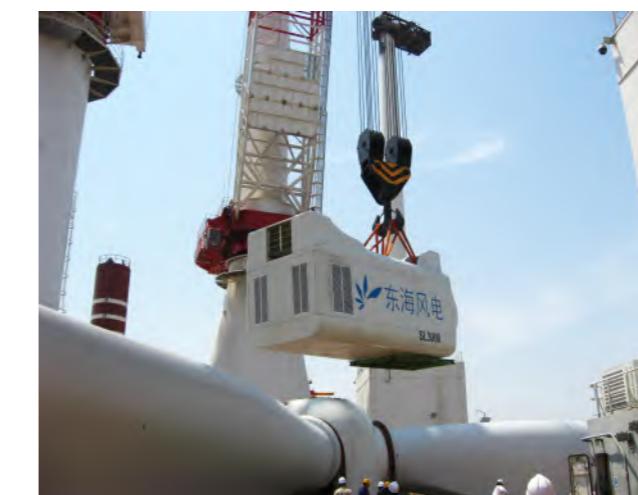
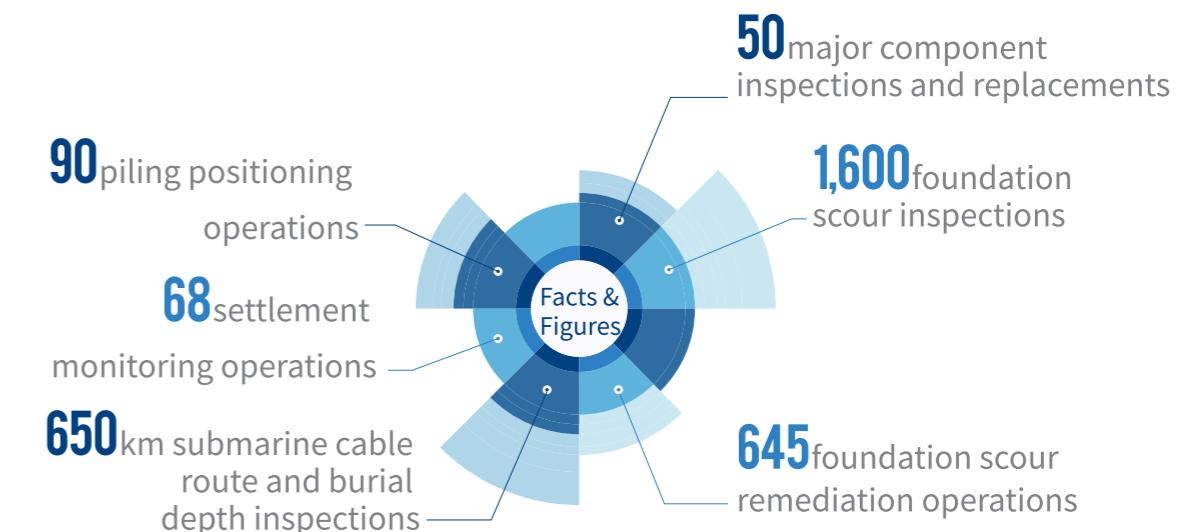


▲ H590 Offshore Floating PV Pilot Project

03 OFFSHORE WIND POWER O&M

Since 2016, HHI has strategically expanded into the offshore wind power operations and maintenance (O&M) sector, establishing Guangdong Huadian Marine Technology Co., Ltd. and Huadian (Yangjiang) Offshore Wind Power O&M Co., Ltd. In October 2024, Huadian Offshore Wind Power O&M Center was officially inaugurated by the group.

HHI provides a comprehensive suite of offshore wind power O&M services, including: R&D of offshore wind technology and equipment; Remote centralized control & fault diagnostics; Testing & verification; Maintenance & repair of offshore wind assets (including substations, wind turbines, submarine cables, towers, and foundations); Equipment energy efficiency enhancement; Hydrographic surveying; Spare parts and consumables supply services; Insurance services; Major component inspection, maintenance, and replacement; Scour monitoring and mitigation; Steel structure corrosion inspection and remediation; Submarine cable fault detection and Emergency response services; Professional O&M equipment services; O&M technology and safety certification; Offshore emergency rescue services.



▲ Shanghai Donghai Bridge Offshore Demonstration Wind Farm Phase I Retrofit Project; Replacement of blades, nacelles, and gearboxes for SL3000 wind turbines



04 MAJOR MARINE ENGINEERING CONSTRUCTION EQUIPMENT

HHI possesses long-term leased, bundled vessel resources, and cooperative assets, including self-elevating installation platform (Huadian 1001, 3060), Dutch IHC S-3600 Hydraulic Pile Hammer, and advanced O&M robots, etc.

✓ The Huadian 1001 is China's first self-owned jack-up platform specifically designed for offshore wind power installation.

It is equipped for coastal wind farm construction and supports various operations, including: pile sinking of wind turbine foundations, hoisting of transition sections, and split hoisting of tower barrels, nacelles, and blades.



Length Overall	89.9m
Beam	39m
Depth	6.6m
Design Draft	3.3m
Lifting Capacity	max. 700t
Lifting Height	Fully rotating hydraulic crane. Main hook: max. 120 m (above main deck) Auxiliary hook: max. 126 m (above main deck)
Pile Gripper Frame	max. diameter 6500 mm
Aft Thrusters	2 × 710 kW fully rotating rudder propellers
Bow Thrusters	2 × 450kW fully rotating rudder propellers
E/R Power Supply	4 × 1100 kW diesel generators 1 × 250 kW air-cooled harbor generator

✓ 3060 Next-Generation Deepwater Self-Elevating Self-Propelled and Self-Transporting Platform

This offshore wind turbine installation vessel primarily serves domestic offshore wind power installation projects. The deck area is capable of accommodating the transportation and installation requirements for 4 × 10MW wind turbine units or 3 × 16MW units. With DP2 dynamic positioning capability, it can achieve high-precision conveying, shifting, positioning, lifting, and installation operations in sea conditions up to force 6, meeting the integrated construction requirements.



Length Overall	133m
Beam	53m
Depth	11m
Design Draft	7m
Lifting Capacity	2200t+300t
Lifting Height	160m above deck, 25m below deck
Applicable Water Depth	65m
Leg Length	120m
Stern Power	3 × 1600kW
Bow Power	3 × 3500kW
Engine Room Power Supply	6 × 3380kW main generators 1 × 800 harbor generator
Variable Payload	10000t

05 COMPREHENSIVE MARINE ENERGY

✓ Offshore Wind Power Development in Deep and Distant Seas

HHI adheres to the development philosophy of "Technological Leadership + Product Assurance + Engineering Services", strategically advancing leading offshore wind technologies for shallow, deep, and ultra-deep waters.

Shallow Water: HHI has successfully promoted and widely applied Flanged Monopile Foundation System and Single-Blade Installation Technology, the company was awarded the National First-Class Prize for Science and Technology Progress.

Deep Water: Under the National "BDB" Project, HHI has conducted in-depth research on deepwater jacket foundation solutions, developed multiple key equipment solutions and a dedicated construction methodology for fixed wind turbine foundations in deep-sea environments. These innovations have been successfully applied in multiple offshore projects.

Ultra-Deepwater: HHI is developing a high-potential commercial Tension Leg Floating Wind Turbine Foundation, which has already received AIP certification from DNV (Norwegian Classification Society).



✓ Outlook on Comprehensive Marine Energy Projects

Offshore wind power, PV, wave energy, salinity gradient energy, and ocean thermal energy conversion are interrelated marine energy sources. The integrated development and utilization of marine energy offer significant advantages: Optimizing marine space utilization; Reducing infrastructure costs (e.g., submarine cable construction and maintenance); Lowering leveled cost of electricity; Enhancing offshore energy efficiency. HHI is actively investing in technological research and demonstration projects to establish a foundation for the comprehensive utilization of marine energy. It is also exploring new technological applications and use cases to offer comprehensive offshore energy solutions, such as multi-energy offshore development, offshore energy islands, marine-based hydrogen, ammonia, and methanol production, carbon-neutral port complexes. Under China's "Dual Carbon" goals, HHI is aligning its strategy with the "Maritime Power" initiative, leveraging technological innovation and zero-carbon solutions to drive the synergistic integration of offshore renewables, hydrogen storage, aquaculture and eco-tourism, and tourism. With a commitment to accelerating the demonstration and application of the "Marine Energy+" ecosystem, HHI aims to establish itself as a world-class provider of comprehensive marine energy solutions, contributing to the sustainable development of the global marine energy industry.



Offshore Wind Power + Marine Ranching



Offshore Wind Power + Hydrogen Production



Offshore Wind Power + Wave Energy



Floating Offshore Wind Power



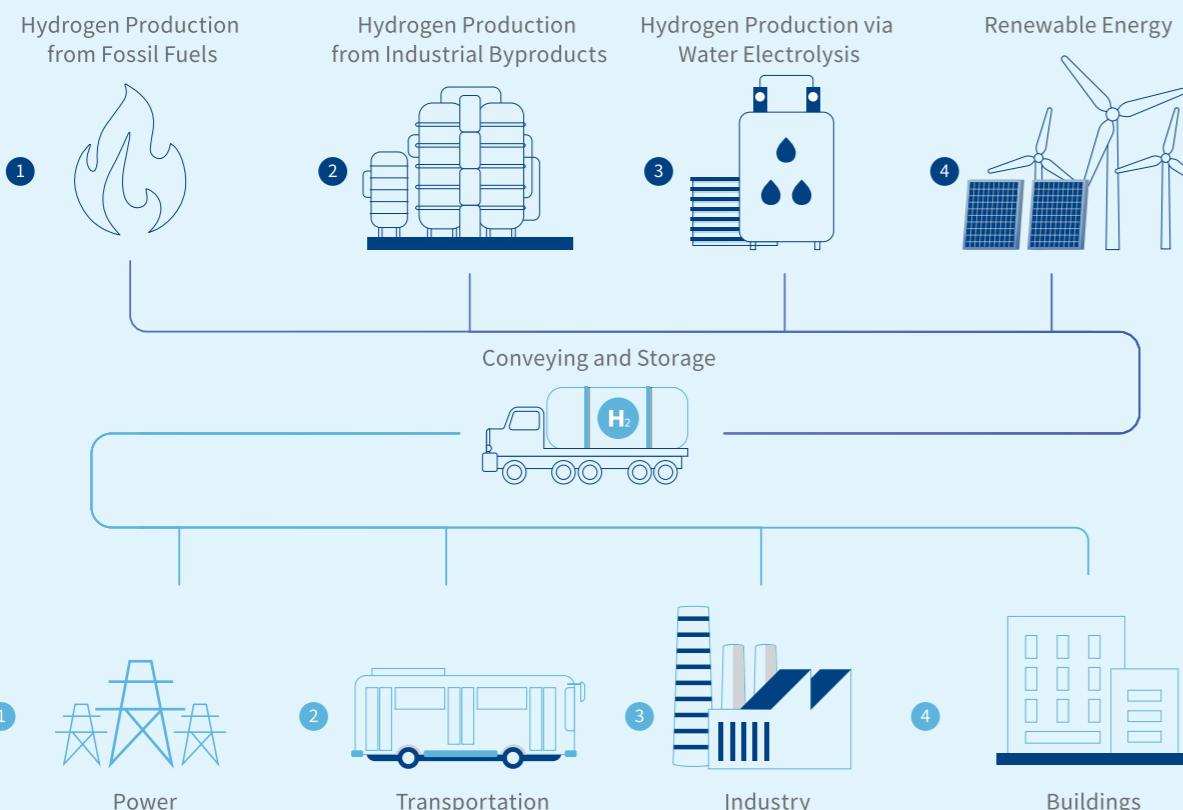
Offshore PV



Offshore Wind Power-Based Hydrogen, Ammonia, and Methanol Production



HYDROGEN ENERGY ENGINEERING



Hydrogen Energy Full Industry Chain Diagram

HHI is actively aligning with China's "Dual Carbon" strategic goals and the clean energy development priorities of CHD and CHEC. Through independent innovation and collaborative development, it focuses on hydrogen energy policies and industry trends; development of hydrogen materials, equipment, and system; hydrogen application technologies; digitalization and intelligent solutions.

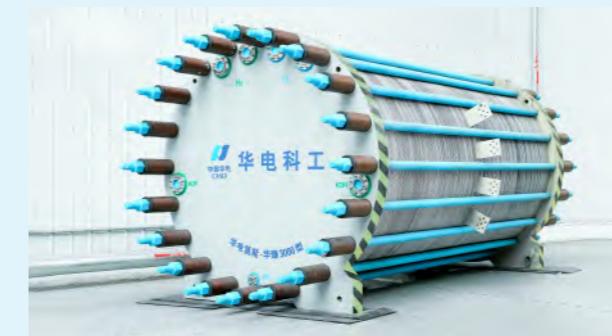
Leveraging its expertise in renewable energy development and utilization, HHI integrates R&D, manufacturing, EPC contracting, system integration, and investment operations into a comprehensive hydrogen energy ecosystem. By advancing technological R&D, equipment manufacturing, engineering services, operations management, and testing & certification, HHI is establishing itself as a leader in the hydrogen energy industry, which aims to develop original core technologies for hydrogen energy, position itself as a key player in the hydrogen energy industrial chain, establish the Huadian hydrogen energy brand. With renewable energy as the foundation, HHI is dedicated to efficient green hydrogen production and seamless integration across the hydrogen value chain.

HHI is driving deep decarbonization in various sectors, including municipal services, conveying, metallurgy, chemical, energy, and fostering a hydrogen-centric, modern, and low-carbon energy system.

01 EQUIPMENT AND MATERIALS

Alkaline Water Electrolysis Hydrogen Production System

HHI has successfully launched its self-developed 3300 Nm³/h alkaline water electrolysis hydrogen production system, with key technical specifications reaching internationally advanced standards. Additionally, all critical components are fully developed in-house, ensuring complete independent control over the technology. Current products range 50 to 3300 Nm³/h, and support customizable solutions to meet owner and project-specific requirements.



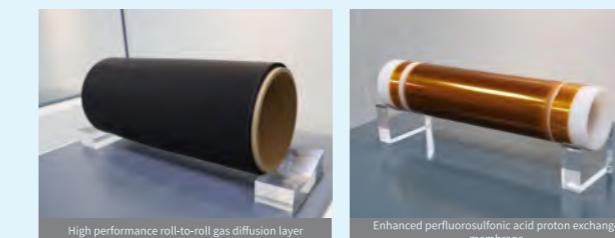
PEM Water Electrolysis Hydrogen Production System

HHI, in collaboration with domestic research institutions, has developed a 5-500 Nm³/h PEM water electrolysis hydrogen production system, establishing core competitive capabilities in core materials, key components and large-capacity PEM electrolyzers. This product was selected among the "Top 10 Technological Innovations in the Energy Industry."



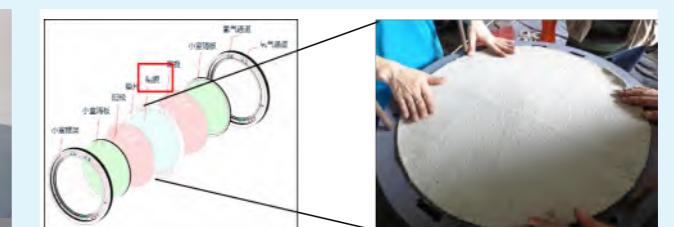
Gas Diffusion Layer (GDL) & Proton Exchange Membrane (PEM)

The GDL and PEM are core materials for hydrogen fuel cells and PEM electrolysis hydrogen production System. HHI has achieved independent and scalable production of high-performance, high-durability, ultra-thin core materials, filling a market gap in China with internationally advanced technical performance.



Composite Membranes for Alkaline Electrolyzers

HHI's self-developed composite membranes for alkaline electrolyzers features low electrical resistance, high gas tightness, superior hydrophilicity, high mechanical strength and stability, extended service life, providing technological support for large-scale alkaline electrolysis hydrogen production.



Membrane Electrode Assembly (MEA)

By optimizing MEA slurry formulations and encapsulation processes, HHI has enhanced electrolysis efficiency, improved pressure resistance and durability, developed high-performance MEAs suitable for high-output PEM electrolyzers.

2.5 MW PEM Electrolyzer Demonstration Platform

HHI has established the largest PEM electrolyzer testing platform in the industry, capable of precise, reliable testing, analysis, and verification of current-voltage characteristics of PEM electrolyzers, O₂ content in H₂ / H₂ content in O₂. This platform provides a robust and accurate testing environment for PEM electrolyzers.



02 EQUIPMENT PRODUCTION LINES

> Alkaline Water Electrolysis Hydrogen Production Line

Capable of simultaneously stacking 3 alkaline electrolyzers. Max. production capacity: 3 units/week.



✓ PEM Water Electrolysis Hydrogen Production Line

China's first MW-scale PEM electrolyzer production line.



▲ Composite Membrane Production Line for Alkaline Electrolyzers

Annual production capacity: 300,000 m². Max. product width: 2.5 m



▲ MEA Production Line

Equipped for automated large-scale spraying and encapsulation of membrane electrodes. Spraying workstation capacity: Active area up to 1400 mm × 900 mm.



▲ GDL Production Line

China's first fully automated gas diffusion layer (GDL) production line with a capacity of over 1 million m². Utilizes roll-to-roll continuous production technology. Full-process online quality monitoring. Max. product width: 1.2 m



▲ PEM Production Line

China's first automated production line for enhanced perfluorosulfonic acid PEMs. Max. product width: 0.6 m.

03 ACHIEVEMENTS

> Huadian Baotou Damaoqi 200MW New Energy Hydrogen Production Demonstration Project, Inner Mongolia

This project is one of the world's first large-scale green Power-to-Hydrogen projects, featuring 11 × 1000 Nm³/h alkaline water electrolysis hydrogen production units and 1 × 1000 Nm³/h PEM electrolysis hydrogen production unit, with annual hydrogen production capacity of 7,800 t. The project integrates high-efficiency coupling of alkaline and PEM electrolysis hydrogen production System, enhancing hydrogen production regulation range and dynamic response speed. By leveraging complementary wind and solar power generation, the project establishes a full hydrogen energy value chain, covering production, storage, refueling, and utilization.



> Liaoning Huadian Tieling Xintaizi Phase I 25MW Off-Grid Wind Power, Energy Storage, and Hydrogen Production Integration Project

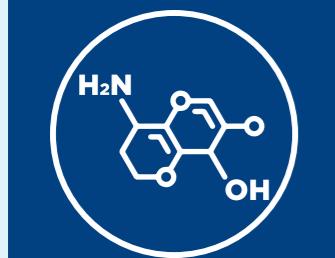
China's first off-grid wind power hydrogen production demonstration project. Independently developed EMS for off-grid hydrogen production enables coupling of hydrogen production loads with the renewable energy system under various operating conditions, optimal capacity allocation for power sources, storage and loads, and implementation of new IGBT conversion technology in off-grid hydrogen production System.



> High-Efficiency Renewable Energy PEM Water Electrolysis Hydrogen Production Equipment Demonstration and Industrialization Project

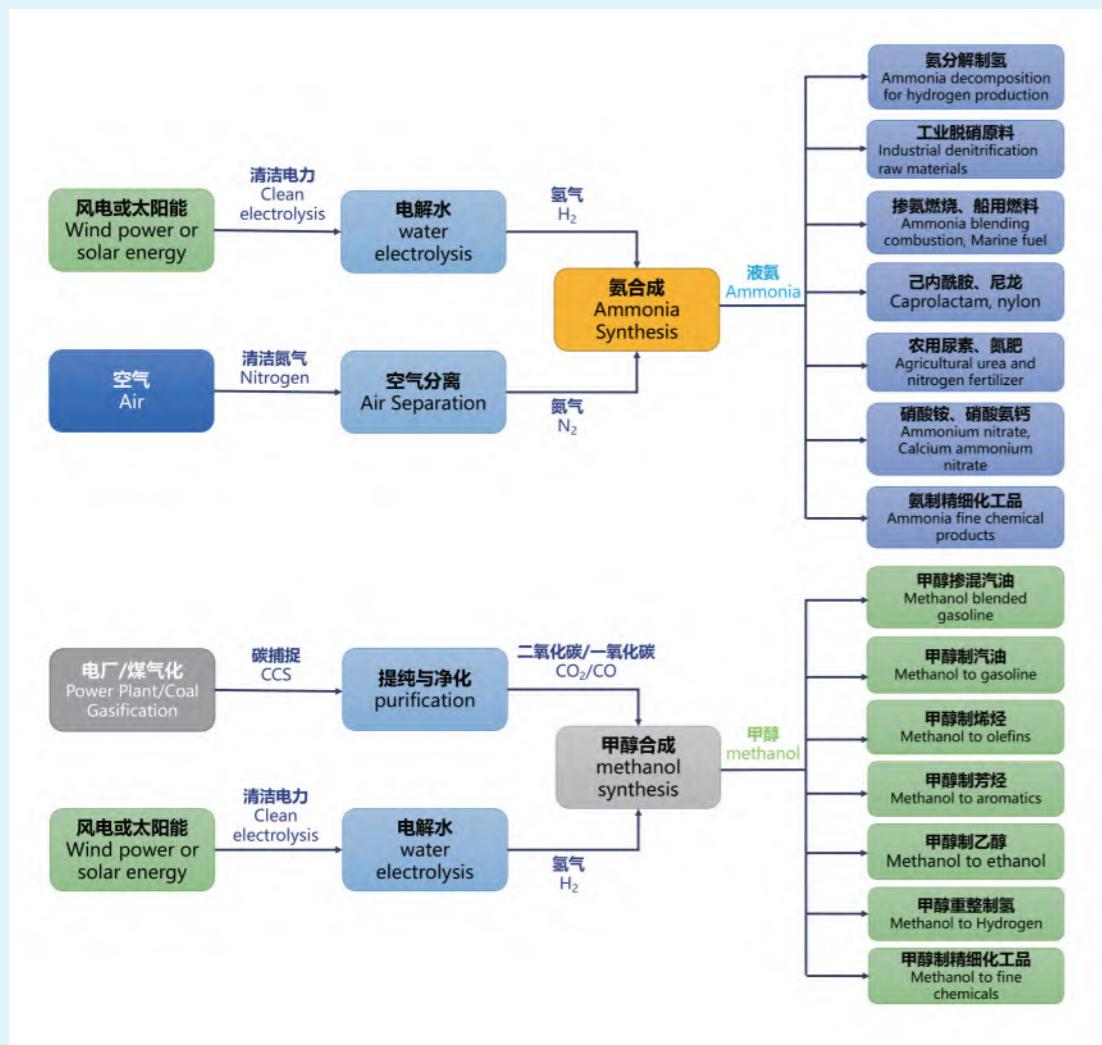
A key project under the National Development and Reform Commission's "Revealing the List and Taking the Lead" Initiative. China's first commercial application of a PEM water electrolysis hydrogen production system. Utilizes the country's first MW-class, 3.0 MPa single-stack PEM electrolysis hydrogen production system. Achieved engineering applications for core materials, key components, system integration. Successfully deployed in high-altitude and extreme cold regions.





METHANOL & AMMONIA ENGINEERING

01 APPLICATION SCENARIOS

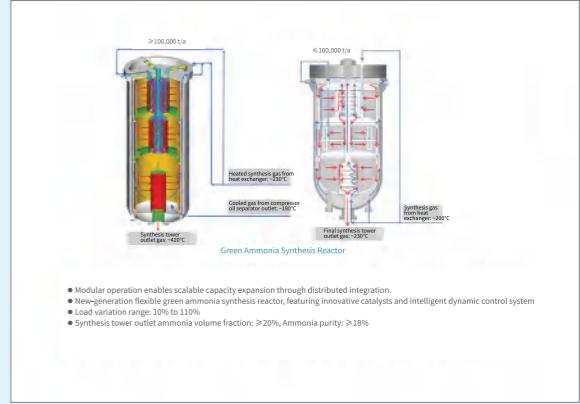
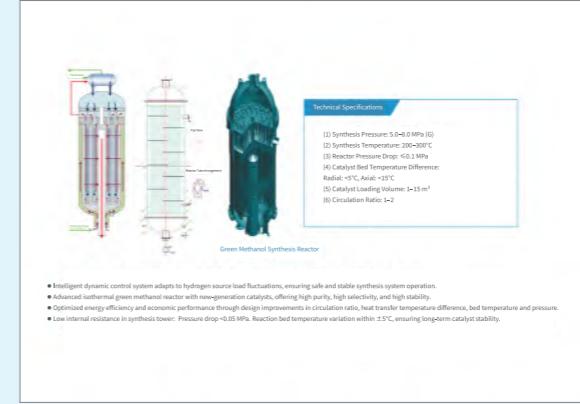


Leveraging HHI's expertise in technological innovation, engineering system design and implementation, as well as investment and operations, HHI places hydrogen energy at its core, serving as a crucial link in establishing a full-industry-chain competitive advantage. This spans from resource generation to end-use consumption, encompassing wind and solar power, green electricity, energy storage, green hydrogen, and green ammonia/methanol.

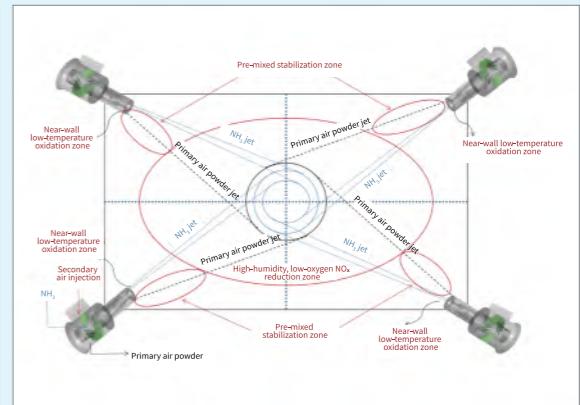
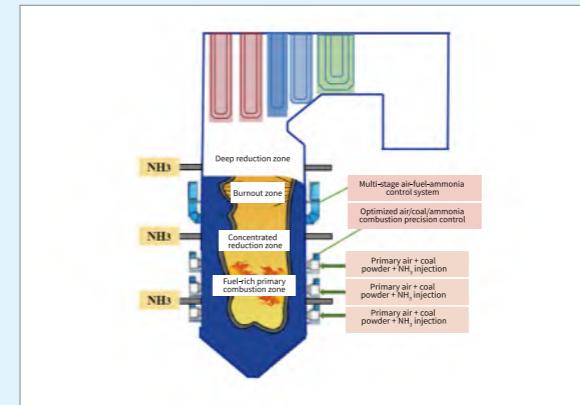
HHI has established a portfolio of proprietary core technologies in high-efficiency, low-cost water electrolysis hydrogen production, microgrid development, carbon capture technology, key materials and core components for efficient green hydrogen coupling with green ammonia and methanol production.

02 CORE TECHNOLOGY

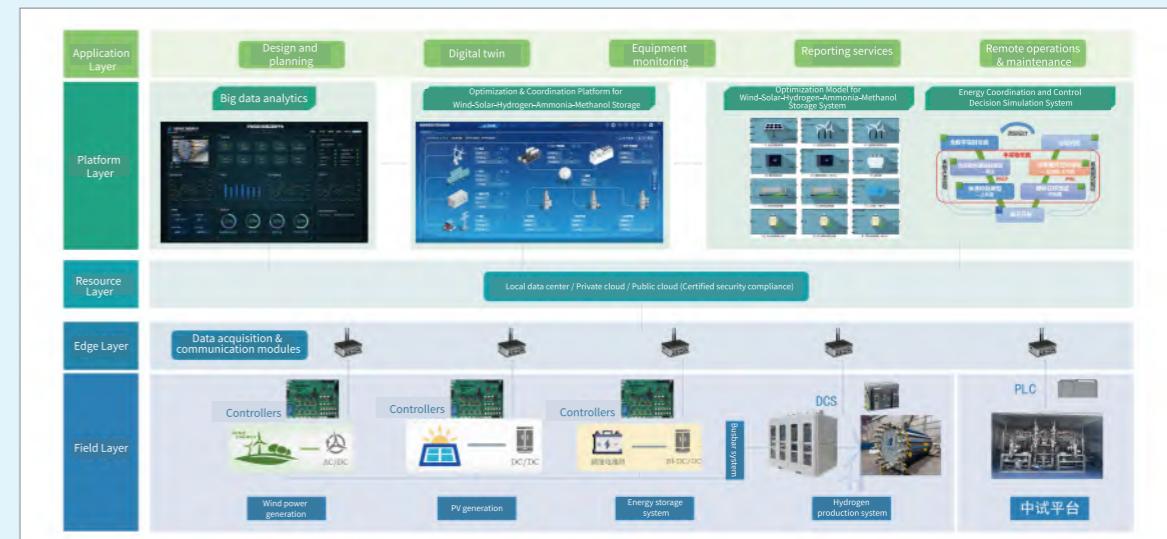
Green Ammonia & Methanol Production Technology



Ammonia Co-Firing Combustion Technology



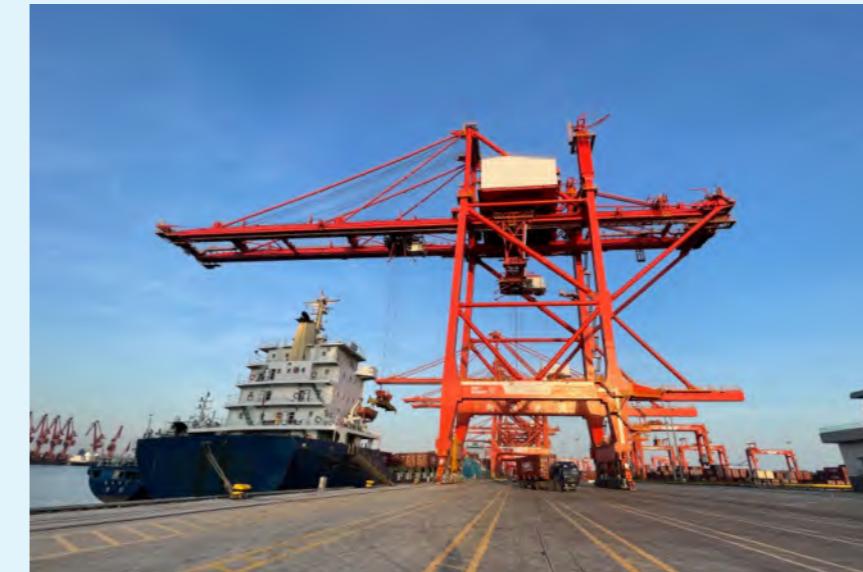
Integrated Decision Optimization & Control Platform for Wind-Solar-Hydrogen-Ammonia-Methanol





INTELLIGENT PORTS ENGINEERING

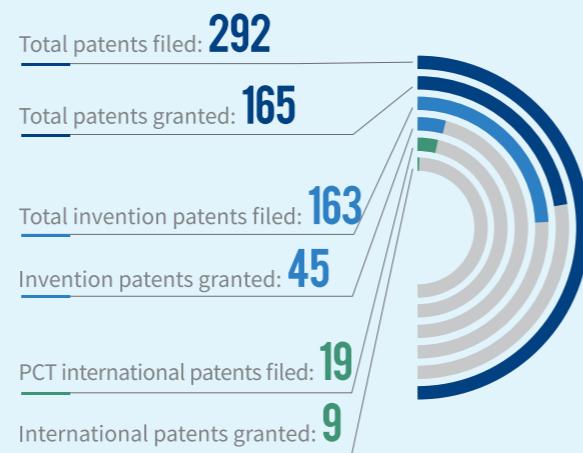
Huadian Lanco Technologies Co., Ltd (hereinafter referred to as Huadian Lanco) is a subsidiary of Huadian Heavy Industries Co., Ltd. (HHI) and a Beijing-based specialized and innovative SME, and committed to advancing efficiency, green environmental protection, energy conservation, carbon reduction, intelligent control, and safety reliability in the port sector. Huadian Lanco specializes in development of intelligent port equipment, including crossing-type double-trolley quay crane terminals, Efficient potential energy recovery automatic yard crane, next-generation chain bucket ship unloader, intelligent port system solutions, such as ECS for intelligent task scheduling, zero-carbon port system development. By integrating cutting-edge technology with green and intelligent solutions, Huadian Lanco aims to become a leading innovator in the Intelligent port sector.



Next-generation quay cranes featuring high operational efficiency, superior energy-saving performance, high-speed operations, and full automation capabilities

Max. operational efficiency per unit: 54 cycles/hour (~108 TEUs/hour). Comprehensive operational efficiency per unit: 42 cycles/hour (~84 TEUs/hour). Efficiency increase: 1.5 to 2 times that of traditional quay cranes. Benefits & Economic Impact: Reduces the number of port equipment; Lowers berth investment and construction costs; Enhances shoreline utilization; Improves comprehensive use of national land resources; Increases vessel turnaround efficiency and overall port throughput; Reduces vessel berthing time; Boosts economic benefits for ports and shipowners; Drives advancements in major port equipment.

Intellectual Property & R&D Achievements

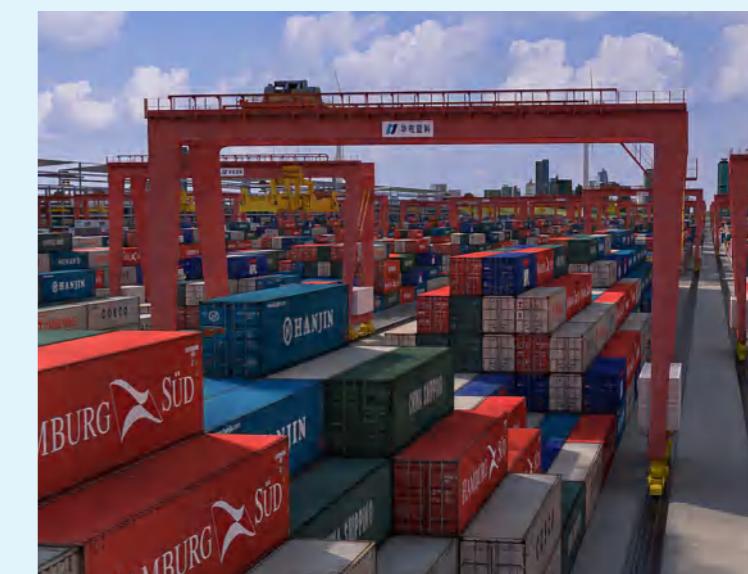


▲ Next-Generation Crossover Dual-Trolley Automated Quay Crane

HHI has pioneered a next-generation new-generation automated twin-trolley traversing quay crane, incorporating a range of groundbreaking technologies, including the traversing twin-trolley innovative framework, intelligent dynamic vibration damping system, new energy-saving system, intelligent control system, and twin-trolley intelligent dispatching ECS system. This breakthrough technology has been included in State-owned Assets Supervision and Administration Commission (SASAC) "Recommended Directory of Technological Innovations by Central Enterprises", China Machinery Industry Federation "Major Technical Equipment Promotion Directory", Beijing "World's First Product" Recognition, Ministry of Industry and Information Technology (MIIT) "First Set of Major Technical Equipment Promotion Guide (2024 Edition)". By overcoming the efficiency bottlenecks faced in port loading and unloading operations over the past 30 years, this technology improves efficiency by over 50% compared to traditional quay cranes. This innovation breaks through technical bottlenecks that have constrained port handling efficiency worldwide for nearly 30 years, achieving a more than 50% increase in efficiency compared to traditional quay cranes. Its implementation greatly enhances terminal loading and unloading efficiency, boosts port throughput capacity, reduces vessel berthing time, and lowers both port operation and maritime logistics costs. Furthermore, it optimizes terminal shoreline utilization, thereby maximizing the comprehensive efficiency of shoreline resources.

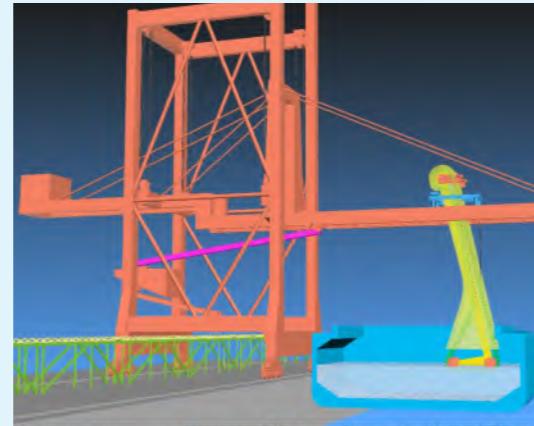
➢ Efficient potential energy recovery automatic RTG

Industry-first high-energy-density gravity recovery technology with an over 80% recovery rate, reducing unit operation energy consumption by 40%. Equipped with an automated monitoring, adjustment, and high-efficiency recovery energy management system, it overcomes challenges in traditional energy recovery. The intelligent RTG task scheduling system enables smart task allocation and seamless coordination between RTG and unmanned container trucks.



> Next-Generation Chain Bucket Ship Unloader

Developed under the LHT Key Project of the State-Owned Enterprise High-End Metal Material Innovation Consortium, this technology overcomes high-wear, high-strength chain bucket core material challenges, reducing reliance on imported key materials for high-end port equipment. Listed in the MIIT's 2024 Catalog of First Major Technical Equipment for Promotion and Application, it is primarily used for coal unloading terminals in thermal power plants, energy storage and transportation centers, and large ore terminals. Efficiency: Over twice the unloading speed of traditional unloaders. Cleaning Reduction: 80% reduction in residual cargo volume. Energy Savings: 20%. Fully automated operation. Improved environmental compliance.



> AI-Based Autonomous Container Truck System

Integrates 5 core modules: perception, positioning, control, decision planning, and human-machine interaction. Enables autonomous execution of dynamic route planning, lane-keeping, adaptive cruise control, autonomous lane changing, intersection navigation, and dynamic obstacle avoidance. Optimized for automated terminal container transport, enhancing smart logistics efficiency.



> Fully Automated Green Container Storage System

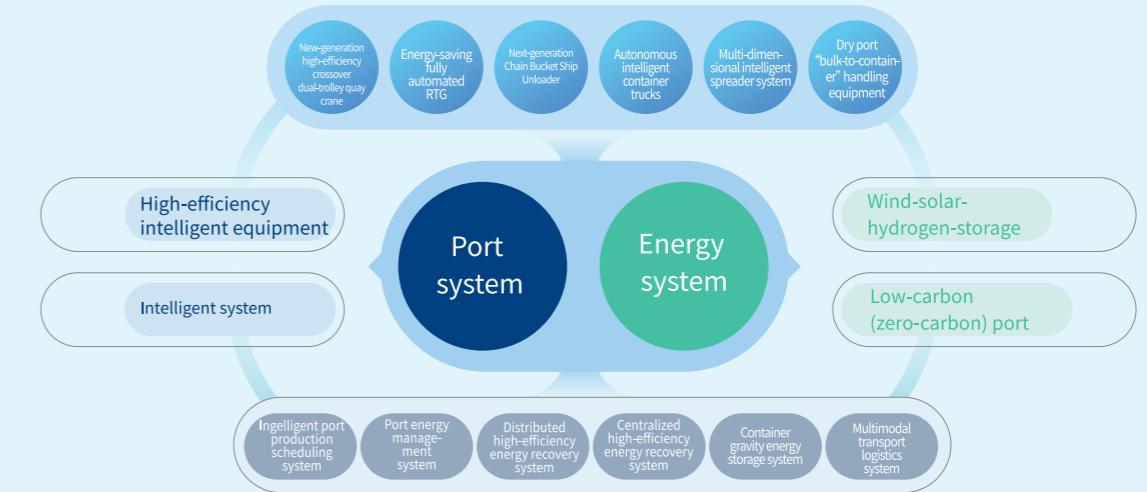
Innovates terminal yard loading, storage, and transfer models, developing a fully automated vertical warehousing system with a new structural design and advanced composite materials. Integrates green power generation and pioneering energy storage technology, combining automated loading/unloading, warehousing, power generation, and energy storage. This significantly enhances yard utilization, boosts operational efficiency, enables full automation, and reduces operating costs.



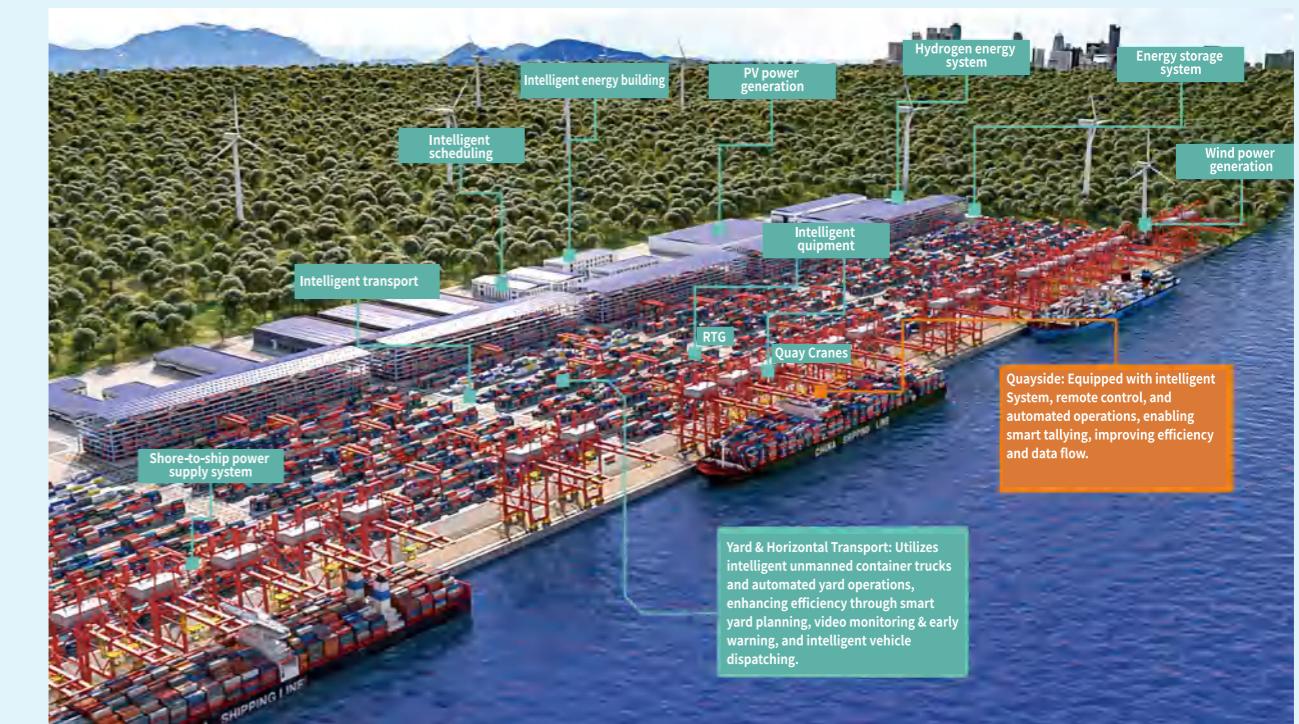
< Zero-Carbon Port System Solutions

Utilizing high-efficiency intelligent equipment, the system integrates energy recovery, multi-energy complementarity, load coordination, and advanced energy storage, transforming the port into not just a logistics and information hub, but a zero-carbon energy center. This establishes a high-efficiency, intelligent, green, and secure next-generation port operation system.

High-End Port Equipment & Intelligent Green System



Aims to be a global leader in high-end port equipment and intelligent green port system, driving efficiency, intelligence, sustainability, and low-carbon port innovations.



04

OVERSEAS ENGINEERING



▼ Boffa Bauxite Handling System, Guinea

The project is located in Boffa Province, Guinea. The investor is Chinalco (Aluminum Corporation of China) Guinea Co., Ltd. HHI undertook the design, supply and installation technical service of the bauxite handling system from the mine to the terminal. The belt conveyor system of this project has the highest belt speed, the largest handling capacity, the most complicated operating conditions and tension system, and is the longest at open-pit mines in both China and Guinea. In addition, the C07 belt conveyor(L=12.3Km) of this system is the longest single-belt conveyor in Africa. The energy consumption per ton of this system is the lowest in the world. Compared with material handling system of similar scale, its construction efficiency is the highest and its construction period is the shortest.



▼ Coke and Coal Conveyor Corridor Project in the Coking Zone of Tsingshan Industrial Park, Indonesia

Located on Sulawesi Island, Indonesia, this project was undertaken by HHI and involves the construction of seven belt conveyor system connecting the port to various coking plants within the industrial park. These conveyors are arranged in a three-tier configuration, with a total length of 15 km, making it the world's first multi-layered belt conveyor system with the highest conveying capacity.



▲ Tanjung Jati 'B' Coal Fired Power Plant Re-expansion Project Units 3&4
2x660MW Coal Handling System, Indonesia

In 2012, this power plant was rated as one of the World's Top Six Coal-fired Power Plants by Power magazine, the largest global publication serving the power generation market.

(Access link:

<https://www.powermag.com/topplanttanjung-jati-b-electric-generating-station-central-java-province-republic-of-indonesia/>



▲ Tanjung Jati 'B' Coal Fired Power Plant Re-expansion Project Units 3&4
2x660MW Coal Handling System, Indonesia

▲ Coal Handling System for the Van Phong 2×660 MW Power Plant, Vietnam



^ Central Java 2x1000MW Coal Fired Power Plant Coal Handling System, Indonesia



< Stackers and Reclaimers at Grosvenor Project for Anglo American, Australia



^ Therma South Unit 1&2 2x150MW Power Plant Coal Handling System, Philippines



The bridge scraper reclaimer with the highest capacity in the world.



^ Wagon Tipper and Ship Loader for Karara Iron Ore Project, Australia

This is the first wagon tipper exported to Australia from China, breaking the local monopoly. The operation of ship loader meets the requirements of zero-emission and helps the customer to realize green production, environmental protection and saving energy.



< Circular Stacker&Reclaimer of Thermal Visayas 2x150MW Power Plant, Philippines



▲ Dak Lak 4X50MW Wind Power Project, Vietnam

The project is located in the north of Krongbuk County, Dak Lak Province, Vietnam, including four 50MW wind farms. The total installed capacity of project is 200MW. HHI undertook the supply of wind turbine tower and the technical service.



▲ Celukan Bawang 3x142MW Power Station Project, Indonesia

The project located in Celukan Bawang, North Bali, Indonesia, is the largest power plant in the region. HHI undertook the construction of coal handling system, thermal piping system and steel structure of the whole plant.



▲ Ca Mau 350 MW Offshore Wind Power Project, Vietnam



▲ Steel Structure Supply for VISY Power Plant, Australia

➢ Duyen Hai 2 2x660MW Thermal Power Plant Project, Vietnam

The project is located in the Economic Development Zone of Duyen Hai, Tra Vinh Province, Vietnam. HHI undertook the supply of coal handling system, thermal piping system and the construction of coal shed of the plant.



▲ Waste Heat Boiler Shell and Flue Supply for JO, Japan



▲ Piping System of Lanco Amarkantak Thermal Power Project, India

➢ Sihanoukville Port 2x350MW Coal-fired Power Plant Project, Cambodia

The project is located in the south side of Kompong som Bay in Cambodia. HHI undertook the construction of coal handling system, thermal piping system and steel structure of the main plant.



05 EQUIPMENT MANUFACTURING

- Caofeidian Base
- Tianjin Base
- Wuhan Base
- Bayannur Base
- Zhengzhou Base

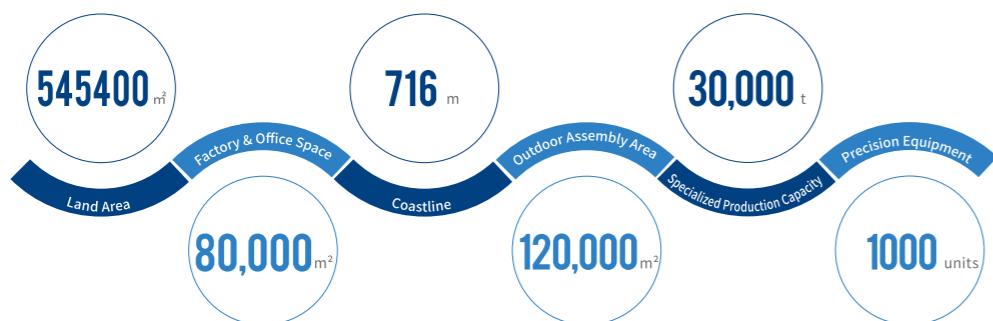




Huadian Caofidian Heavy Industries Co., Ltd. (Caofidian Base)

Located in the Caofidian Area of the China (Hebei) Pilot Free Trade Zone, Caofidian Base specializes in bulk material handling equipment, marine heavy-duty machinery, intelligent port equipment, hydrogen energy solutions, and high-end operation and maintenance services. Its business spans multiple sectors such as power, metallurgy, chemical, building materials, coal, port, marine heavy industry, and new energy.

The Caofidian Base is a crucial element of CHD's large-scale Caofidian energy project. It functions as CHD's northern marine energy base and a pilot site for integrating wind, solar, biomass, hydrogen storage, ammonia, and methanol technologies. As a coastal heavy-industry equipment maker in China, it's honored as a model for industrial-informatization integration in Hebei. It's a national high-tech firm, an AAAA-level standard-compliant enterprise in Hebei, an R&D hub for above-scale industrial enterprises in Hebei, and a provincial-level specialized and innovative demonstration enterprise. The base holds key qualifications such as top qualification of steel structure, crane manufacturing (including installation, repair) license, secondary qualification of power project general contracting.



Huadian Heavy Industry Machinery Co., Ltd. (Tianjin Base)

Located in Tianjin Beichen Technology Park, Tianjin Base focuses on wind turbine towers, heavy steel structures, composite materials, electronic materials, advanced membrane materials, mechanical and electrical equipment, concrete structures, gas-liquid separation, and purification equipment. The base has been recognized as a National High-Tech Enterprise, Tianjin Leading Technology Enterprise, and Tianjin Specialized & New SME and holds China's highest steel structure production qualification & D1/D2 pressure vessel manufacturing licenses and certificates of CE, AISC, ISO 9001, ISO 14001, ISO 45001, and Safety Standardization Level III.

In 2022, the Tianjin Base actively implemented the Group's "1+1+N" hydrogen energy development strategy, systematically advancing the construction of the Huadian (Tianjin) High-End Intelligent Manufacturing and Technological Innovation Base. To date, seven strategic emerging business production lines have been established, including hydrogen gas diffusion layers and alkaline electrolytic water hydrogen production system. Additionally, the industry's highest-power PEM electrolyzer demonstration platform has been commissioned, and the 2GWh electrochemical energy storage PACK assembly line is progressing steadily.

140,000⁺

Annual Steel Structure Capacity

150

Electrolyzer Production Line

1,000,000⁺

GDL Production Line

50,000⁺

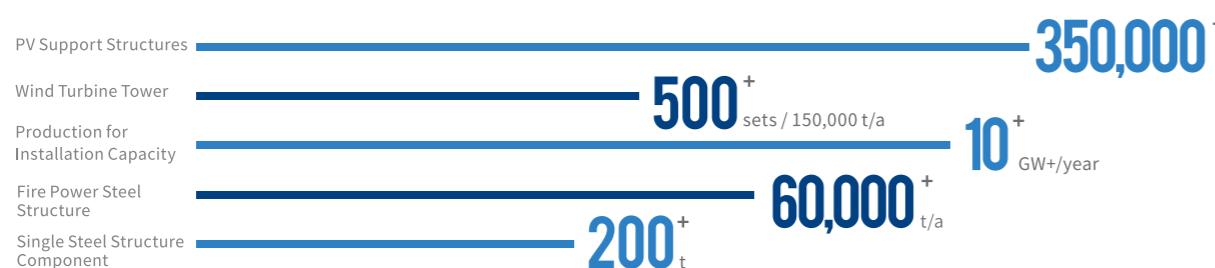
PEM Production Line



[Wuhan Huadian Engineering Equipment Co., Ltd. \(Wuhan Base\)](#)

Located in Gedian Development Zone, Hubei Province, Wuhan Base covers an area of 128,000m² and a plant area of 22,500 m². With 405 advanced manufacturing and testing facilities, and supercritical thermal power steel structure production capacity exceeding 1GW, the base specializes in high-end steel structures for energy, environmental protection, civil construction, and infrastructure industries. The main business includes manufacturing, installation, and sales of high-end steel structures of key projects for national infrastructure and export markets. The products range from thermal power steel structures, wind turbine towers, PV support structure, coal yard enclosed trusses, building steel structures to petrochemical and bridge steel structures. The project footprint spread in China, Southeast Asia, Central Asia, Europe, the Americas Africa,etc.

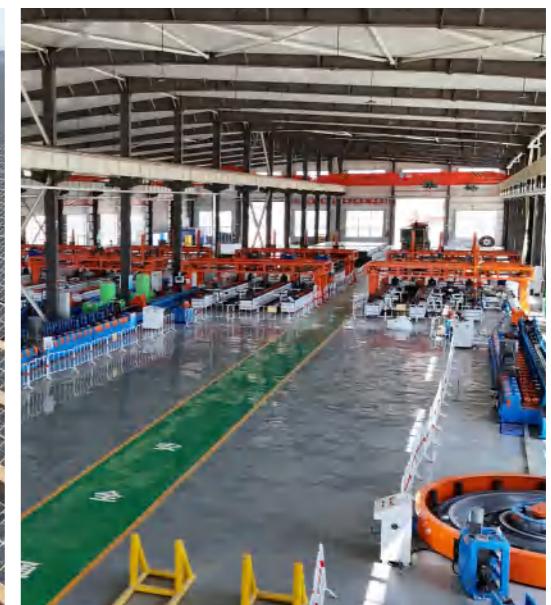
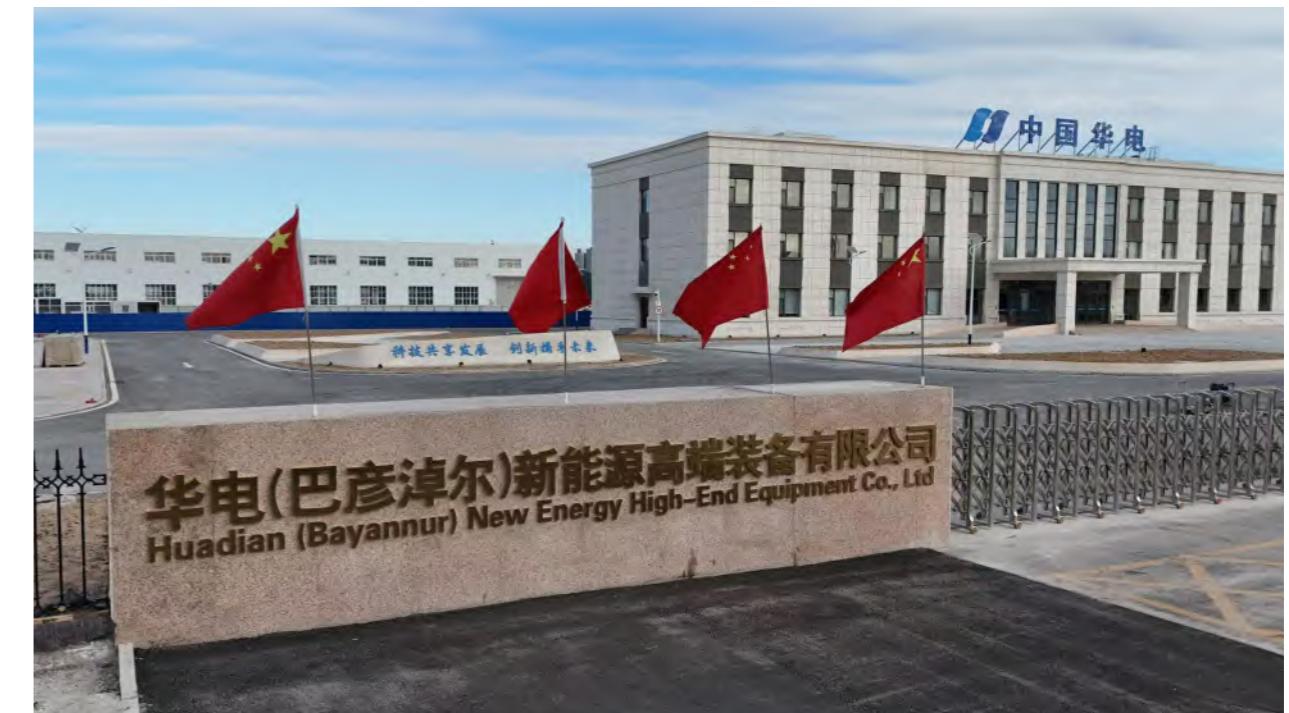
Wuhan Base is the PV equipment manufacturing base of HHI, and honored as the National High-Tech Enterprise, Hubei Province "Little Giant" Specialized Enterprise, Hubei Province Intelligent Construction Technology Innovation Center. The base has aquired Grade 1 Steel Structure Manufacturing Qualification, Grade 1 Boiler Steel Structure Manufacturing Qualification, Pressure Vessel Manufacturing License, Certificates of ISO 9001 ,| ISO 14001 , ISO 45001,EN1090 & AISC and, Digital Integration Management System.



[Huadian \(Bayannur\) New Energy High-End Equipment Co., Ltd. \(Bayannur Base\)](#)

Established in 2023 in Dengkou County, Bayannur City, Inner Mongolia, Bayannur Base is a key part of CHD's industrial sector in northern China and serves as a HHI's key manufacturing base for the design, manufacturing and technical service of PV support structure.

Bayannur Base covers an area of 66,000m² and boasts 6,000 m² factory buildings. The base equipped with 8 automated PV support structure production lines and flexible PV support structure production line. The annual capacity reaches more than 200,000 t, and is capable of meeting the requirements for projects with annual installation capacity of 6GW . The base passed certifications of ISO 9001, ISO 14001 and ISO 45001. Its main products include rooftop and ground-mounted PV support structure system.



Henan Huadian Jinyuan Piping Co., Ltd. (Zhengzhou Base)

Located in the Zhengzhou Aviation Port Economic Experimental Zone, Zhengzhou Base covers an area of 100,000 m², with the piping prefabricating processing capacity of 35,000t. It is known as a large-capacity, high-parameter power station piping processing base, providing comprehensive piping services and solutions for power plants customers from domestic and abroad.

Zhengzhou Base has been honored as the National High-Tech Enterprise, Intellectual Property Demonstration Enterprise,,Henan Province "Specialized & New" SME, Henan Province Innovation SME, Henan Power Station Pipeline Prefabrication Engineering Technology Research Center, Henan Province Enterprise Technology Center and CNAS-Certified Metal Laboratory. It holds certifications for Special Equipment (Grade A Pressure Pipeline Components, Grade A Boiler Parts, Pressure Vessels A2/A3) , ASME-Certified with "S" (Boiler) & "PP" (Power Piping) Stamps.

Zhengzhou Base mainly manufactures HP/IP/LP pipes,tubes and fittings for thermal power, nuclear power and chemical plants and HP/IP/LP storage tanks, spherical tanks, molten salt tanks, and heat exchangers for chemical and energy storage applications., The Base ranks in the tops of high-temperature, high-pressure pipeline processing for large generation units ,and is becoming a key manufacturing base of HHI for thermal energy, hydrogen-ammonia-methanol storage & transport, and energy storage

**TYPICAL ACHIEVEMENTS****Huadian Heavy Industries Co., Ltd.****Material Handling System Engineering****No. Project Name**

- 1 EPC Project of Pipe Belt Conveyor System for Henan Hebi Heqi 2×660MW Power Plant
- 2 PC Project of Coal Handling System and Coal Storage & Conveying System for Jiangsu Huadian Jurong Phase II Expansion Project 2×1000MW Power Plant
- 3 EPC Project of Thermal Power Coal Bunker Project for Wanhua Chemical (Yantai) Chlor-Alkali Thermal Power Co., Ltd.
- 4 EPC Project of Coal Handling Island for Wuhan Huadian Pingjiang Phase I 2×1000MW Power Plant
- 5 EPC Project of Specialized Ore and Bulk Berths Stockyard System (Including Equipment and Auxiliary Facilities for Loading and Unloading Operations) at Jingtang Port
- 6 EPC Project of the Stockyard and Wagon Tipper System at Coal Berths No. 36 to No. 40 in Tangshan Jingtang Port Area
- 7 EPC Project of the Loading and Unloading Process System Equipment and Supporting Facilities in Tangshan Port Caofeidian port area Phase III Coal Terminal
- 8 Construction Project of Huadian Laizhou Smart Eco-Friendly Green Energy Base
- 9 EPC Project of Xuwei New District Dry Bulk Cargo Conveyor System Phase I
- 10 EPC Project of Solid Material Storage and Conveying Facilities in the High-Sulfur Coal Clean Utilization, Coal-to-Oil, Chemical, Power and Heat Integration Demonstration Project for Shanxi Lu'an Mining Group Co., Ltd.
- 11 EPC Project of Sulfur Product Bulk Storage and Loading System Project for Sinopec Zhongyuan Puguang
- 12 EPC Project of Solid Material Storage and Conveying System of the 1.2 Million t/a Fine Chemicals Demonstration Project for Inner Mongolia Yitai Chemical Co., Ltd.
- 13 EPC Project of the Coal Unloading and Storage System in the Guangxi Huayi Industrial Gas Island Project
- 14 EPC Project for Raw Coal, Petroleum Coke, and Ash Storage and Conveyor System of the Fine Chemical and Raw Materials Engineering Project for Northern Huajin United Petrochemical
- 15 Dome Silo Cluster System Project of Xinjiang Bayi Iron & Steel Co., Ltd.
- 16 EPC Project for Waste Rock Conveyor and Dumping System in the 3 Million t/a Mining and Dressing Expansion Project of Chongqing Taihe Iron Mine
- 17 EPC Project for Bulk Material Conveying Belt Conveyor Corridor from Songshuwuo to Kongwan in Xiaoxiang Town, Gaoyao District, by Zhejiang Communications Mining (Zhaqing) Co., Ltd.
- 18 EPC Project for Overland Curve Belt Conveyor System and Finished Product Silo Feeding System of Zhenxi Mine
- 19 EPCO General Contract for Long Belt Conveyor Corridor in Zhongjiaochong Limestone Mine for Construction Aggregates of Hubei Chuxin Mining Co., Ltd., Yudu City
- 20 EPC Project of Coal Handling Island, Section D of the Jinchang 2×1000MW Peaking Coal Power Project at the Hexi New Energy Base in the Tengger Desert, Gansu Province
- 21 EPC Project of Boffa Bauxite Mine Belt Conveyor System for CHINALCO in Guinea

22	Integrated Coal and Coke Conveyor Corridor Project in the Coking Zone of Tsingshan Industrial Park, Indonesia
23	Coal Handling System Project of TJB 2×660MW Power Plant in Indonesia
24	Coal Handling System Project of Therma South 2×150MW Power Plant in Philippines
25	Coal Handling System Project of Van Phong 2×660MW Power Plant in Vietnam
26	Belt Ore Conveyor System Project for Shougang Hierro Peru Mine No. 5 Mining Area
27	O-Type Wagon Tipper and Shiploader for Karara Iron Ore Mine in Australia
28	Port Machinery Equipment of the 70,000-Ton Terminal for Alumina Production in Bintan Nanshan Industrial Park, Indonesia
29	Ship-unloader Project for Phase I, Step II of Huaneng Taicang Coal Storage and Conveying Center
30	1,800 t/h Bridge-Type Grab Ship-unloader Project for the 2×660MW Coal-Fired Units at Zhanjiang Jingxin Donghai Power Plant
31	Petroleum Coke Conveyor System Shiploader for the CNOOC Guangdong Huizhou Refining Project
32	Bucket Wheel Reclaimer Supply for the Phase II Expansion of the Haiphong Power Plant in Vietnam
33	Stacker&Reclaimer Supply of Grosvenor Project for Anglo American in Australia
34	Twin Scraper Reclaimer Project of the Dome Storage System for SPIC Baiyinhua Phases I and II No. 2 Open-Pit Coal Mine
35	Stacker&Reclaimer Supply for the Dome stockyard system of the "Large Units Replacing Small Units" Expansion Project at Guodian Jiujiang Power Plant
36	Wagon Tipper Supply for the 2×660MW Advanced Coal-Fired Units of Jinan Thermal Power Group Co., Ltd.

Steel Structure Engineering

No.	Project Name
1	Xinjiang Huadian Hami 2×1000MW Coal Power Project, Steel Structure Indirect Cooling Tower EPC Contract (Section C)
2	Huaneng Gansu Longdong Energy Base Million-Ton CO ₂ Capture, Utilization, and Storage Demonstration Project, Natural Ventilation Dry Cooling System EPC Contract
3	Hami Thermal Power Phase IV Steel Structure Cooling Tower Project
4	Zouxian Power Plant Phase IV Steel Plate Ash Silo Project
5	Huadian Tengzhou Xinyuan Thermal Power Co., Ltd. Fly Ash Steel Silo Project
6	Huadian Zibo Power Co., Ltd. Ash Silo Engineering Project
7	Huadian Inner Mongolia Energy Co., Ltd. Zhuozi Power Plant, Coal Yard Enclosure Project
8	CHD Jiangsu Wangting Power Plant, Coal Yard Dust Control Retrofit EPC Contract
9	Huadian Ningxia Lingwu Power Co., Ltd. New Heating Reserve Coal Yard EPC Contract
10	Huadian Tuyou Power Plant 2×660MW Strip Coal Yard Enclosure EPC Contract
11	Huadian Inner Mongolia Energy Co., Ltd. Baotou Power Branch Coal Yard Enclosure EPC Contract
12	Longde Coal Mine No. 3 Coal Yard Enclosure Project (PC Contract)
13	Shaanxi Huadian Pucheng Power Co., Ltd. Coal Yard Dust Control Engineering
14	Datang Qitaihe Power Co., Ltd. Phase I & II Fully Enclosed Coal Yard Retrofit EPC Contract
15	Vietnam Coastal Phase II 2×660MW Coal Power Plant, Dry Coal Shed Grid Structure and Enclosure System Design, Supply, and Construction
16	Shanghai Boiler Works Huaneng Inner Mongolia Great Wall 2×1000MW Boiler Steel Structure Project
17	Shanghai Boiler Works Xinjiang Changji West Heishan 2×660MW Boiler Steel Structure Project
18	Johor, Malaysia RAPID Steel Structure Project
19	Shanxi Yuxian Power Plant, 2×1000MW Main Plant Steel Structure Project
20	Indonesia Boya 2×660MW Pithead Power Plant, Steel Structure Project
21	Cambodia Sihanoukville 2×350MW Coal Power Plant, Steel Structure Project
22	Indonesia Batam Power Plant, Steel Structure Anti-Corrosion Retrofit Project
23	Chengde Civil Aviation Airport Terminal Building Project
24	Jiangxi Xinyu and Yichun High-Speed Railway Station Buildings

Thermal Energy Engineering

No.	Project Name
1	Xinjiang Huadian Hami 2×1000MW Coal Power Project, Steel Structure Indirect Cooling Tower EPC Contract
2	China Energy Ningxia Zhongwei Power Plant 4×660MW Unit Expansion Project, Direct Air Cooling Equipment Supply
3	Huaneng Gansu Longdong Energy Base Million-Ton CO ₂ Capture, Utilization, and Storage Demonstration Project, Natural Ventilation Dry Cooling System EPC Contract
4	State Grid Energy Xinjiang Zhundong Coal Power Co., Ltd. Zhundong Power Plant Phase I 2×660MW Supercritical Unit, Main Machine Indirect Cooling System EP General Contract
5	Shihezi Chemical New Materials Industrial Park Tianfu Power Plant Phase I 2×600MW EPC Contract
6	Huadian Xinjiang Hongyanchi Power Co., Ltd. Multi-Energy Complementary Units #1 and #2 Flexibility Upgrade EPC Contract
7	Huadian Inner Mongolia Energy Co., Ltd. Baotou Power Branch Units #1 and #2 Flexibility Upgrade EPC Contract
8	China Resources Power (Heze) Co., Ltd. Unit #2 Air Preheater Anti-Clogging Retrofit EPC Contract
9	Huadian Xinzhou Guangyu Coal Power Co., Ltd. Unit #3 Air Cooling System Energy Optimization Retrofit EPC Contract
10	Zheneng Taizhou Phase II Expansion Project 2×1000MW Ultra-Supercritical Unit, Six Major Pipeline Materials, Fittings, and Prefabricated Piping Supply
11	Fujian Huadian Kemen Phase III 2×1000MW Coal Power Project, Six Major Pipeline Materials, Fittings, and Factory Prefabrication Procurement
12	Zhejiang Beilun Power Plant Phase I Energy Saving and Emission Reduction Retrofit Project, 2×1000MW Ultra-Supercritical Coal-Fired Units, Six Major Pipeline Materials, Fittings, and Prefabrication
13	China Energy Shandong Boxing Power Plant 2×1000MW Ultra-Supercritical Project, Six Major Pipeline Materials, Fittings, and Factory Processing & Prefabrication
14	Chang'an Yiyang Power Co., Ltd. Phase III 2×1000MW Ultra-Supercritical Project, Six Major Pipeline Materials, Fittings, and Factory Processing & Prefabrication
15	Hunan Huadian Pingjiang Phase I 2×1000MW Ultra-Supercritical Project, Four Major Pipeline Materials, Fittings, Factory Processing & Prefabrication, and Hanger & Support System Supply
16	Shanxi International Energy Yuguang Coal Power Co., Ltd. Yuxian Power Plant, 2×1000MW Power Units, Four Major Pipeline Materials, Fittings, and Piping Supply
17	Huadian Laizhou Power Co., Ltd. Phase II 2×1000MW Ultra-Supercritical Unit, Six Major Pipeline Materials, Fittings, Factory Processing & Prefabrication, and Hanger & Support System Supply
18	Jiangsu Huadian Jurong Phase II 2×1000MW Expansion Project, Six Major Pipeline Materials, Fittings, Factory Processing & Prefabrication, and Hanger & Support System Supply
19	Hubei Energy Ezhou Phase III 2×1000MW Ultra-Supercritical Four Major Pipeline Materials, Fittings, and Factory Processing & Prefabrication Supply
20	Hubei Energy Yicheng Power Plant 2×1000MW Ultra-Supercritical Four Major Pipeline Materials and Factory Processing & Prefabrication Supply

Noise Control Engineering

No.	Project Name
1	Hangzhou Huadian Banshan Power Co., Ltd. Deindustrialization Retrofit Project, Noise Control and Auxiliary Engineering Design, Procurement, and Construction EPC Contract
2	Shanghai Huadian Fengxian Nanqiao New Town Energy Center, Comprehensive Noise Control Project
3	Dongguan China Power New Energy Thermal Power Plant 2×350MW Gas Turbine Expansion Project, Noise Reduction EPC Contract
4	Huadian Guangzhou Zengcheng Gas Combined Cooling, Heating, and Power (CCHP) Project, Full-Plant Noise Control
5	Huadian Qingdao Natural Gas Cogeneration Project, Noise Control EPC Contract
6	Huadian International Power Co., Ltd. Shiliquan Power Plant Phase I, Full-Plant Noise Control EPC Project
7	Hainan Yisheng Petrochemical Co., Ltd. PTA Phase II, Air Compressor Room Soundproofing and Noise Reduction Supply & Construction Project
8	Guangdong Datang International Baochang Gas Thermal Power 2×400MW Expansion Project, Noise Control Equipment Supply

9	Sichuan Huadian Neijiang Baima 2×475MW Gas Turbine Innovation Demonstration Project, Full-Plant Noise Control Facilities Engineering
10	BASF (Guangdong) Integrated Project Phase I (New Engineering Plastics & Thermoplastic Polyurethane with Supporting Utilities), Noise Emission Research and Technical Services

Marine Engineering

No.	Project Name
1	Shanghai Donghai Bridge Demonstration Offshore Wind Farm Phase I Retrofit Project
2	Taiwan Changhua Offshore Leading Wind Farm Project
3	CPI Binhai North H1# 100MW Offshore Wind Power Project
4	SPIC Binhai North H2# 400MW Offshore Wind Power Project
5	CPI Dafeng H3# 300MW Offshore Wind Power Project
6	Hebei Construction Investment Tangshan Laoting Puti Island 300MW Pilot Offshore Wind Farm Demonstration Project
7	CTG New Energy Guangdong Yangjiang Yangxi Shapa 300MW Offshore Wind Power Project
8	Huaneng Sheyang Offshore South H1# 300MW Offshore Wind Power Project
9	SPIC Binhai South H3# 300MW Offshore Wind Power Project
10	Huadian Fuping Haitan Strait 300MW Offshore Wind Farm Project
11	SPIC Jieyang Shenchuan No. 1 400MW Offshore Wind Power Project
12	Yancheng Guoneng Dafeng H5# 200MW Offshore Wind Power Project
13	Zhejiang Huadian Taizhou Yuhuan Phase I 300MW Offshore Wind Power Project
14	CGN Houhu Offshore Wind Power Project
15	SPIC Shandong Peninsula South No.3 300MW Offshore Wind Power Project
16	Vietnam Ca Mau 350MW Offshore Wind Power Project
17	Longyuan Power Jiangsu Offshore Longyuan Wind Power Co., Ltd. Sheyang 1GW Offshore Wind Power Project
18	Hainan Dongfang CZ8 Site 500MW Offshore Wind Power Project
19	Zhejiang Huadian Wenling Shitang 200MW Tidal-Flat PV Power Project
20	Guohua HG14 Offshore PV Project

Offshore Wind Power O&M

No.	Project Name
1	SPIC Jiusi Offshore Wind Farm, Submarine Cable Emergency Repair Project
2	Donghai Bridge Offshore Wind Farm, Major Component Inspection & Replacement Project
3	SPIC Binhai North H1 Offshore Wind Farm Foundation Scour Protection Project
4	Huadian Qingzhou No.3 Offshore Wind Farm Offshore Substation, Wind Turbine Foundation, and Submarine Cable Route Scour Survey Project
5	Mingyang Guangdong Eastern Sea Area 20 Wind Turbines Major Component Optimization Project
6	Mingyang Datang Jiangsu Binhai 5 Wind Turbine Positions Major Component Optimization Project
7	Huadian Qingzhou No.3 Offshore Wind Farm, Comprehensive O&M Project

Hydrogen Energy Engineering

No.	Project Name
1	CHD's Top 10 Key Research Projects, Renewable Energy Hydrogen Production, Large-Scale Energy Storage, and Comprehensive Hydrogen Utilization Technology R&D Project
2	Inner Mongolia Huadian Baotou Damaoqi 200MW New Energy Hydrogen Production Demonstration Project (PC General Contract – Hydrogen Production Station)
3	Liaoning Huadian Tiebing Xintai Phase I 25MW Off-Grid Wind Power, Energy Storage, and Hydrogen Production Integrated EPC Project
4	Qinghai Huadian Haixi Delingha 3MW Photovoltaic Hydrogen Production Project, Delingha PEM Electrolyzer Demonstration Project
5	Hanhong Hydrogen Technology Co., Ltd. Green Hydrogen Industrial Park, 1×1000Nm ³ /h Electrolyzer System
6	Cangzhou Photovoltaic-Storage-Hydrogen Integrated Multi-Energy Complementary Demonstration Project, Hydrogen Production Equipment Installation (PC) Contract

PV Engineering & Support Structure Supply

No.	Project Name
1	Zhejiang Huadian Jinhua Pan'an 100MW Photovoltaic Power Generation EPC Project, Flexible Bracket Engineering
2	Huadian Shanxi Wuxiang Panlong Town 100MW Photovoltaic-Storage Project
3	Huadian Shaanxi Ying County 50MW Photovoltaic Integration Demonstration Phase I Project
4	Shaanxi Huadian Hanyin Phase I 100MW Agri-PV Complementary Power Generation Project, Additional 15.6MW Flexible Bracket Engineering
5	Zhejiang Huadian Jiande Dayang Town 150MW Agri-PV Complementary Power Generation Project
6	Inner Mongolia Huadian Tengger Desert 1GW Photovoltaic Project, Fixed PV Bracket Supply
7	Tibet Huadian Lhasa Duilongdeqing Bangcun 200MW Pasture-PV Complementary Power Generation Project, PV Bracket Supply
8	Ulan Buh Desert Northeast New Energy Base 1GW Photovoltaic Power Generation Pilot Project
9	Ningxia Huadian Lingwu Wind-Solar Complementary Integrated Operation Pilot Demonstration Phase I 195MW Project, Fixed PV Bracket Supply
10	Inner Mongolia Tongwei Silicon Energy Green Power Supply Project, Fixed PV Bracket Supply

Wind Turbine Tower Supply

No.	Project Name
1	Xinjiang Beijiang Urumqi 1GW Wind-Solar New Energy Base 800MW Wind Power Project
2	Xinjiang Changji Mulei Forty Wells 800MW Wind Power Project
3	Huadian Qinghai Qingyu UHVDC Phase II Mangya Lenghu 500MW Wind Power Project
4	Shaanxi Huadian Jingbian Hanjia Gou 200MW Wind Power Project
5	Tianjin Baodi Dabai Village & Huangzhuang Town 200MW Wind Turbine Tower Project
6	Datang New Energy Pingshun Hongti Pass Wind Farm Phase II 30MW Wind Turbine Tower & Accessories Project
7	CGN Shaanxi Tongguan Phase I & II Wind Power Generation Project, Wind Turbine Tower & Flange Equipment Supply
8	Hunan Huadian Yongzhou Ningyuan Tongmuluo 200MW Wind Turbine Tower Project
9	Datang Yunnan Pingba East 96MW Wind Farm Tower Project
10	Vietnam Dak Lak 4×50MW Wind Power Project, Krong Buk #1 & #2 Wind Farm Tower & Anchor Bolt Supply

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