華能國際電力股份有限公司
Huaneng Power International, Inc.

環境、社會及管治報告
Environmental, Social and Governance Report
2020

Contents

Chairman's Statement

The "13th Five-Year Plan" period marked a significant and extraordinary five years in the development of Huaneng International. During the period, we faced complicated and severe external conditions, with an increasingly competitive market environment and significant challenges in our operations and reform amid the sudden impact of COVID-19. Despite these challenges faced, we successfully achieved our key objectives and responsibilities as planned, with our persistent determination in rapid developing to be an international leading power generation listed company through implementing new development ideas, undertaking our missions, committing to power production safety and green development, intensifying compliance and operation upgrading and transformation.

In the past five years, we fulfilled our responsibilities in safeguarding power energy, consistently strengthening our safety management standards and risk management measures to enhance our asset quality and achieve operational performance. We upheld our key principle of pursuing progress while ensuring stability, vigorously implementing excellent operation, production safety and environmental protection measures, and actively participating in the reform of the power industry.

In the past five years, we were committed to green, low-carbon, clean energy and quality development, with accelerating transformation and upgrading. We have been continuously optimising our power structure to further promote a low carbon environment. The proportion of our installed capacity of low-carbon and clean energy generation had exceeded 20%, with the continuing transformation and upgrade of our coal-fired power generation, and our achievement in emission performance continued to outperform our industry peers.

In the past five years, we insisted on taking technological innovation as the primary driving force, accelerated the application of innovative results, increased the quantity and quality of technological patents and made major breakthroughs in the research and development of key & core technologies. In addition, we have implemented a number of technological upgrading projects for production and operation, market competitiveness has significantly increased, and technological innovation has produced remarkable results for supporting high-quality development and promoting transformation and upgrading.

In the past five years, we adhered to our international development strategic plan, actively participating in the Belt and Road Initiative, intensively cultivating and expanding the overseas business markets, vigorously enhancing operational performance of Tuas Power operations, and further enhancing our international operation and management capability.

In the past five years, we were committed to "serving the nation, benefiting the society, seeking multiple wins and growing together" in fulfilling our social responsibilities, contributing our efforts for poverty alleviation, actively responding to the demands of our stakeholders, and working with other parties to achieve high-quality and sustainable development.

The "14th Five-Year Plan" period will be a critical period for the Company to further accelerate our transformation and upgrade in raising our capabilities in quality development to a new level to achieve more strategic successes, in the midst of many potentials and opportunities ahead. Adhering to the directional goal of "peaking carbon dioxide emissions and carbon neutrality", with the theme and driving forces of high-quality development, reform and innovation, we will further accelerate the development of new energy, promote the optimisation and upgrade our coal-fired power structure, and further enhance our management capability and operational controls to achieve higher quality, more efficient, more sustainable and safer development.

Zhao Keyu
Chairman
Huaneng Power International, Inc.


中国华能

02

About **Us**

2.1 Company Profile

Huaneng Power International, Inc. ("Huaneng International", "the Company" or "we") was incorporated on 30 June 1994. The core business of the Company is, by making use of modern technology and equipment and also financial resources available domestically and internationally, to develop, construct and operate large scale power plants. The Company is one of China's largest listed power producers, as well as the first power company in China to get listed in New York, Hong Kong and Shanghai.

As the core enterprise of China Huaneng Group Co., Ltd.'s ("Huaneng Group" or "Group Company") central industry, Huaneng International is committed to developing itself into an international leading power generation listed company, committed to providing sufficient, reliable and environmentally friendly power and high-quality energy services for the society, as well as to system, technology and management innovations. On aspects regarding the advancement in power technologies and construction and management of power plants, the Company has been the pioneer and has created various milestones within the domestic power industry, which facilitated the great leap development of the power business and technological advancement of the power station equipment manufacturing industry in China, and also significantly contributed to the improvement of technical and management standards of the domestic power generation enterprises.

Throughout the years, with dedicated efforts, the Company has expanded successively with steady growth in competitive strengths. The success of the Company is attributable to its various advantages, including advantages in scale and equipment, advantages in geographic layout of power plants, strong support from major shareholders, sound corporate governance structure, advantages in market reputation, extensive experience in the capital markets, advantages in overseas development, staff with high calibre and professional management.

As of 31 December 2020, the Company had a controlling generation capacity of 113,357 MW and an equity-based generation capacity of 98,948 MW. The Company's domestic power plants are located in 26 provinces, autonomous regions and municipalities. The Company wholly-owns a power company in Singapore and invests in a power company in Pakistan.

The Company won the China Securities Golden Bauhinia Award – "Outstanding Listed Company in the 30th Anniversary of Capital Market" and the "Helmsman of Digital Economy" award issued by the Securities Daily. These awards were great honour for the Company, and reflected the full recognition by the capital market for the Company's long-standing standard operation and active efforts in achieving good returns for its shareholders, as well as the demonstration of the Company's welcoming public image in the international capital market.

As at 31 December 2020, the Controlling Generation Capacity is

113,357 MW

The Equity-Based Generation Capacity is

98,948 MW

2.2 Corporate Governance

As a public company listed in three markets both domestically and internationally, the Company is subject to the regulations of the securities regulatory authorities of the three listing venues and the supervision of investors at large. Since its establishment, the Company has been completing and improving its modern governance system and capacity in accordance with the requirements of modern enterprise systems. We have established and improved a corporate governance structure consisting of the shareholders' general meeting, the Board, the Supervisory Committee, and the management team and built an operating system where those granted with decision-making power, supervisory power, and management powers have clearly-defined powers and responsibilities, perform their duties, check and balance each other, and coordinate with each other, ensuring the effective enforcement of the decision-making power of the shareholders' general meeting and the Board, and the supervisory power of the Supervisory Committee, and the efficiency and compliance of the operation and management power of the management team.

Through years of exploration and practice, it has gradually built up a sound and regulated corporate governance structure and an effective system of rules that caters for the development of the Company. The Company will regularly review and evaluate the suitability of the corporate governance structure and make any necessary amendments and improvements to achieve a dynamic maintenance system.

2.3 Development Strategy

The Company fully implements the new development concept of "innovation, coordination, green, openness, sharing," following the requirements of constructing a clean, low-carbon, safe and efficient modern energy system, adheres to quality and efficiency as the center goal, reform and innovation as the driving force, and system and mechanism as the guarantee, take the deepening of the supply-side structural reform as the main line, coordinate energy security and green development, comprehensively promote high-quality development, and build the Company into a standardized managed, technological leading, energy saving and environment protecting, reasonable structured and excellently operated, world's leading listed power generation company with excellent corporate governance regime and outstanding market value.

The Company adheres to the new energy security strategy of "Four Revolutions, One Cooperation" as the foundation, vigorously implements the green development strategy, prioritizes quality and efficiency, adheres to both independent development and acquisition, make full use of the favorable conditions for the centralized development of renewable energy in the country's "Three-North", coastal, southwest and part of the central China, and further build a large scale clean energy base of "base type, clean type, complementary type, intensification, digitalization, and standardization", accelerates the leap-forward development of new energy, accelerates the optimization and upgrading of coal power structure, develops well-performed gas power and other clean energy power generation, and actively expand integrated energy services. The Company wishes to vigorously implement innovative development strategies, lead high-quality development with technological innovation, serve national technological strategies, adhere to the company's major needs, improve technological innovation systems and mechanisms, and promote digital transformation and focus on international development; The Company expects to vigorously implement safe development strategies, constantly lay a solid foundation for management, improve intrinsic safety, build environmental protection and safety barriers, deepen comprehensive risk management, improve risk prevention and control and emergency response mechanisms, and improve capability of risk prevention, control and resolution. The Company wishes to vigorously implement the excellent operation strategy, adheres to the orientation of promoting profitability, improving efficiency, and creating value, consolidate the foundation of operation and management, improve management efficiency, optimize the asset structure, comprehensively improve the company's modern management and control level, and vigorously promote the improvement of quality and efficiency, improve corporate governance, enhance company brand value, and earnestly fulfill social responsibilities.

2.4 Company Philosophy

Corporate Missions	• Becoming a "red" company that contributes to and serves national strategies, ensures energy security, and serves socialism with Chinese characteristics • Becoming a "green" company that carries out energy revolution, helps construct an ecological civilisation, and provides clean energy and power to meet the needs of the people for living beautiful lives • Becoming a "blue" company that participates in global energy stewardship, serves the "Belt and Road" construction and positively contributes to building a community of shared future for mankind
Corporate Core Values	• Upholding integrity, focusing on cooperation • Innovating continuously, progressing actively • Creating achievements, serving the state serving the Country
Corporate Target	• Developing itself into an international leading power generation listed Company
Corporate Responsibilities	• Provision of sufficient, reliable and environmental-friendly power for the society • Strive for delivery of long-term, stable and increasing returns to shareholders • Support the fully development for employees to establish self-achievements
Corporate Spirits	• Spirit of professional dedication – undergoing all conceivable hardships and using every conceivable means • Spirit of pioneering – cutting paths through mountains and building bridges across rivers • Spirit of progress – finding oneself gaps and pushing oneself ahead • Spirit of innovation – daring to lead and venturing to do the impossible
Corporate Manner	• Being good at pioneering; focusing on efficiency; caring for reputation; thrifty in working

2.5 ESG Responsibility Management

The Board of Directors assumes the overall responsibility for the Company's tactics and reports on environmental, social and governance ("ESG") as well as for the assessment and determination of risks concerning ESG, and ensures for the Company the establishment of a proper and effective system of risk management and internal supervision thereto. The Company's management provides information to the Board of Directors to assess the effectiveness of the system. The effective ESG management of the Company's Board of Directors and management drives the improvement of operation and management of Huaneng International.

Situations Faced with the Company's ESG

The Central Economic Work Conference focused on the general trend of national economic development and proposed key tasks such as strengthening the national strategic scientific and technological strength, comprehensively promoting reform and opening up, and making well efforts on carbon peak and carbon neutrality, which will help navigating the country's economic development in 2021 and a longer period of time.

In the electricity market, with comprehensive consideration of international and domestic conditions, industrial and local developments, epidemic and the uncertainty of the external environment as well as other factors, under absent of floods and other extensive, extreme climate changes, it is expected that in 2021, total electricity consumption nationwide will increase by 6% to 7%, newly installed power generation capacity for infrastructure construction will be approximately 180 million kilowatts, and utilization hours of thermal generating units will be generally consistent with or slightly lower than that in 2020.

In the coal market, the increase in electricity consumption in the whole society in 2021 may lead to increase in coal demand, while under the influence of policies such as carbon peaking and carbon neutrality, the increase in the proportion of clean energy may offset part of the increase in coal demand. As a result, the overall coal consumption level is expected to increase slightly from last year. In terms of supply, entering the "14th Five-Year Plan" period, the coal industry's capacity reduction task has been basically completed, and the continued orderly release of advanced production capacity will maintain the supply of coal at a relatively good level, and imported coal will continue to play a complementary role to domestic coal. Overall, in 2021, both ends of the supply and demand of China's coal market will see a certain growth, the fundamentals will be in a balanced state, and the price center of thermal coal will move up slightly from 2020.

In terms of the capital market, the central bank's monetary policy will maintain continuity, stability, and sustainability in 2021, and the prudent monetary policy adopted will be more flexible, accurate, reasonable and appropriate, with the objective to maintain reasonable and sufficient liquidity, and maintain the growth rate of the money supply and the scale of social financing basically matching the nominal economic growth rate. It is expected that the capital market interest rate will basically remain stable in 2021.

ESG Governance and Management

In addition to providing supervision and guidance, the Company's Board of Directors holds regular meetings at which management teams present their reports on strategic development, production safety, operation and management, internal controls, and corporate social responsibility. There are four committees under the board, strategy, audit, nomination, and remuneration and evaluation. The strategy committee is in charge of the Company's decision making in comprehensive risk management and regularly reviews reports on the Company's risk management work. Its responsibilities include, but are not limited to, risk rating, risk management, effectiveness evaluation, and approval of the Company's comprehensive risk management annual report as well as risk assessment reports on important decisions. The audit committee is responsible for identifying and assessing the risk of fraud committed by senior executives and board members of the Company and compiles independent fraud risk assessment reports. It also regularly reviews reports on the Company's internal controls and evaluates the effectiveness of the internal control system, and communicates with the human resources department on issues concerning recruitment and code of conduct. All members on the audit committee are independent directors of the Company who carry out onsite inspection every year to monitor and make recommendations on production safety, operation and management, internal controls and corporate culture of the Company's subsidiaries. The management of production safety, employee health, energy conservation and environmental protection, fraud risk, internal controls and corporate culture has already been incorporated into the daily work of the board and its various committees.

To ensure that the requirements of Environmental, Social and Governance Reporting Guide (《環境、社會及管治報告指引》) ("ESG Reporting Guide") issued by The Stock Exchange of Hong Kong Limited ("Hong Kong Stock Exchange" or "HKEX") are effectively implemented, the Company has established an ESG leading workgroup. A dedicated principal of the Company has been assigned as the group leader, with principals of different departments and offices being vice group leaders. They make decisions on major issues during the process of the guidelines' implementation. Different departments also have assigned certain relevant personnel as group members to take charge of daily communication and detailed implementation of ESG actions. With the establishment of ESG work leading group, the contact mechanism of ESG management has made its appearance in the Company. This has established a work model of ESG management, which is guided by the Board of Directors, led by the Company's managements and participated by many departments together, and comprehensively guaranteed the effectiveness and applicability of the Company's ESG management.

2.6 Table of Key Performance Indicators in 2020

Based on the requirements of HKEX's ESG Reporting Guide and the Global Reporting Initiative (GRI)'s Sustainability Reporting Standards (《可持續發展報告指南》), Huaneng International has prepared and analysed the Company's ESG 2020 key performance indicators, benchmarking against the guidelines' requirements and its peer companies, as set out below.

Performance Categories	Performance Indicators	2020	2019
Economy	Operating revenue[1] (100 million RMB)	1,694.46	1,740.09
	Sales of power and heat[1] (100 million RMB)	1,614.53	1,649.36
	Sales of coal and raw materials[1] (100 million RMB)	18.87	18.81
	Port service[1] (100 million RMB)	1.98	1.75
	Transportation service[1] (100 million RMB)	0.52	0.49
	Others[1] (100 million RMB)	58.56	69.68
	Operating expenses[1] (100 million RMB)	1,557.34	1,597.99
	Net profit[1] (100 million RMB)	26.11	11.08
	Targeted poverty alleviation fund spending (ten thousand RMB)	2,731.90	2,372.70
	Controlling generation capacity[1] (MW)	113,357	106,924

Performance Categories	Performance Indicators	2020	2019
Economy	Equity-based generation capacity[1](MW)	98,948	93,676
	Domestic power generation (100 million kWh)	4,040.16	4,050.06
	Average annual unplanned outage (times/unit·annum)	0.19	0.22
Environment	Coal consumption rate for thermal power unit (g/kWh)	291.08	294.01
	Year-on-year change of coal consumption rate for thermal power unit (%)	1.00 ↓	0.35 ↓
	Consumption of standard coal (ten thousand tons of standard coal)	11,817.11	11,122.21
	Oil consumption in production (tons)	29,761.39	32,056.74
	Natural gas consumption (ten thousand of standard cubic meters)	537,014.18	478,015.35
	House consumption rate of plants (%)	4.33	4.49[2]
	Overall water consumption (million tons)	18,193.78	18,268.44
	Fresh water consumption in power generation (million tons)	382.74	435.82
	Water consumption in open cooling circulation (million tons)	17,811.04	17,832.62
	Performance value of consumption of fresh water in power generation (kg/kWh)	0.95	1.08
	Performance value of emission of sulphur dioxide (g/kWh)	0.07	0.06
	Performance value of emission of nitrogen oxides (g/kWh)	0.13	0.13
	Performance value of soot emission (g/kWh)	0.01	0.01
	Sulphur dioxide emissions (tons)	25,990.39	25,355.58
	Nitrogen oxides emissions (tons)	50,875.08	52,501.67
	Soot emissions (tons)	3,264.55	3,583.00
	Total amount of energy-related direct greenhouse gas emissions (ten thousand tons of carbon dioxide equivalent)	33,328.88	33,615.42
	Greenhouse gas emissions generated by coal consumption (ten thousand tons of carbon dioxide equivalent)	32,107.79	32,495.00
	Greenhouse gas emissions generated by natural gas consumption (ten thousand tons of carbon dioxide equivalent)	1,024.91	915.40
	Greenhouse gas emissions generated by fuel consumption (ten thousand tons of carbon dioxide equivalent)	9.53	9.92
	Greenhouse gas emissions generated by desulphurisation (ten thousand tons of carbon dioxide equivalent)	186.65	195.10
	Energy-related direct greenhouse gas emission intensity (grams of carbon dioxide equivalent/kWh)	726.09	733.89
	Total amount of energy-related indirect greenhouse gas emissions (ten thousand tons of carbon dioxide equivalent)	11.37	14.72

Performance Categories	Performance Indicators	2020	2019
Environment	Energy-related indirect greenhouse gas emission intensity (grams of carbon dioxide equivalent/kWh)	0.25	0.32
	Total water discharge (million tons)	17,282.60	17,237.21
	Total discharge of sewage (million tons)	31.98	34.50
	Total discharge of open cooling circulation water (million tons)	17,250.62	17,202.71
	Hazardous liquid water production (tons)	784.59	721.62
	Production of denitration catalysts (tons)	7,899.14	8,034.30
	Production of other hazardous solid waste (tons)	201.09	210.45
	Intense of hazardous waste (g/kWh)	0.02	0.02
	Production of general solid waste (ten thousand tons)	4,133.50	3,949.59
	Production of fly ash and cinder (ten thousand tons)	3,274.18	3,064.44
	Production of desulphurised gypsum (ten thousand tons)	859.32	885.15
	Intense of general solid waste (kg/kWh)	0.10	0.10
	Comprehensive utilisation rate of fly ash and cinder (%)	89.08	89.87
	Desulphurisation gypsum disposal utilisation rate (%)	87.55	81.78
	Amount of grievous (and above) environmental accidents (times)	0	0
Society	Total amount of full-time contractual employees[1] (persons)	57,874	58,263
	Number of employee deaths due to duty[3] (persons)	0	0
	Number of contractor and subcontractor deaths due to duty[4] (persons)	1	0
	Grievous personal injury and death accidents (employees) (times)	0	0
	Personal injury and death accidents during the power production (times)	0	0
	Accidents that endangered safe operation of power grid (times)	0	0
	Lawsuits on corruption raised and concluded against the Company or its employees (items)	0	0
	Average equivalent availability of thermal power units (%)	94.92	93.49[5]

1 The scope of statistic of Operating revenue (including Sales of power and heat, Sales of coal and raw material, Port service, Transportation service and Others), Operating expenses, Net profit and Total amount of full-time contractual employees, takes Singapore Tuas Power Ltd., the wholly owned subsidiary of Huaneng International and Huaneng Shandong Ruyi (Pakistan) Energy (Private) Limited into consideration, of which the Operating revenue (including Sales of power and heat, Sales of coal and raw material, Port service, Transportation service and Others), Operating expenses and Net profit are published in accordance with the International Financial Reporting Standards, Others including Lease income. The statistical range of Controlling generation capacity and Equity-based generation capacity includes Singapore Tuas Power Ltd., the wholly owned subsidiary of Huaneng International.

2 The data was the weighted average house consumption rate in 2019.

3 Number of employee deaths due to duty: the number of employees who died from production safety incidents

4 Number of contractor and subcontractor deaths due to duty: the number of deaths of contractors and subcontractors during production for which the Company is responsible.

5 The data was the average equivalent availability factor of coal-fired power unit.

2.7 Communication with Stakeholder and Identification of Material Issues

2.7.1 Information about and Communication with Stakeholder

Huaneng International has always been adhering to the corporate responsibilities of "providing sufficient, reliable and environmental-friendly electrical power to the society; creating a long-term, stable and incremental return to our shareholders; and providing our staff with an environment which encourages contribution and facilitates career development and integrated development" by fully considering and effectively responding to stakeholders' demands, and worked together with all stakeholders to promote economic and social development and share corporate development achievements.

Stakeholders	Expectations of Stakeholders	Main Mechanisms of Communication and Participation	Responses from the Company
Investors	Increase of the Company's market value and profitability. The Company's environmental and social responsibility performance continues to improve	Shareholders' meeting; information disclosure; company website	Truthful and thorough disclosure of information; investment of efforts in improving business performance and generating profits; absorption of market opinions for rectification of operating behaviours; investment of efforts in the improvement of environmental and social responsibility management
Clients	Assurance of high-quality products; guarantee of good service	Making contracts and agreements	Supply of sufficient, reliable and eco-friendly energy and services; guarantee of safe stable delivery of power and heating
Employees	Guarantee of welfare, health and security; improvement of communication mechanism; impartiality concerning in chances of promotion and development	Employment contracts; employees' assembly	Strict observance of provisions within employment contracts; improvement of the institution of employee's assembly; improvement of administration of salary and welfare; provision of healthy and safe work environment; provision of avenues for vocational advancement and training
Suppliers	Honest, fair and just cooperation; mutual benefits and win-win scenarios	Making contracts and agreements; regular communication through mutual visits; correspondence through files, letters and telegraphs	Adherence to open and transparent business principles and processes; active fulfilment of contracts and agreement; promotion of mutual visits
Communities	Joint cultivation of communal civility; support for public welfare; focus on social development	Promotion and organization of public welfare activities; participation in volunteer activities; guarantee of employment	Extensive organisation of and active participation in public welfare undertakings; cultivation of harmonious and civilized communities; attempts at growth of local employments
Regulatory Authority	Observance of disciplines and laws; compliance with operation; green energy; energy conservation and emission reduction	Participation in relevant energy meetings, work reports, policy consultation and information submissions	Strict observance of relevant laws and stipulations; vigorous advocation and promotion of energy conservation and emission reduction
Competitors	Fair competition; honest cooperation; joint development; safe production	Participation in industry associations[6], policy studies, daily meetings and business exchanges	Competition and cooperation with competitors; jointly creation of a healthy and orderly competitive environment; mutual benefits and joint progress

[6] Such as the China Electricity Council, the China Electric Power Promotion Council and the Chinese Society for Electrical Engineering.

2.7.2 Process of Identification of Material Issues

According to requirements of HKEX's ESG Reporting Guide, Huaneng International refers to relevant procedures for substantive analyses from GRI, collects and identifies issues at the heart of key stakeholders' interests by way of questionnaires, interviews, etc. Huaneng International analyses and prioritises collected information and determines the Company's material issues with respect to ESG disclosed in the report.

The process of identification of material issues is divided into four steps:

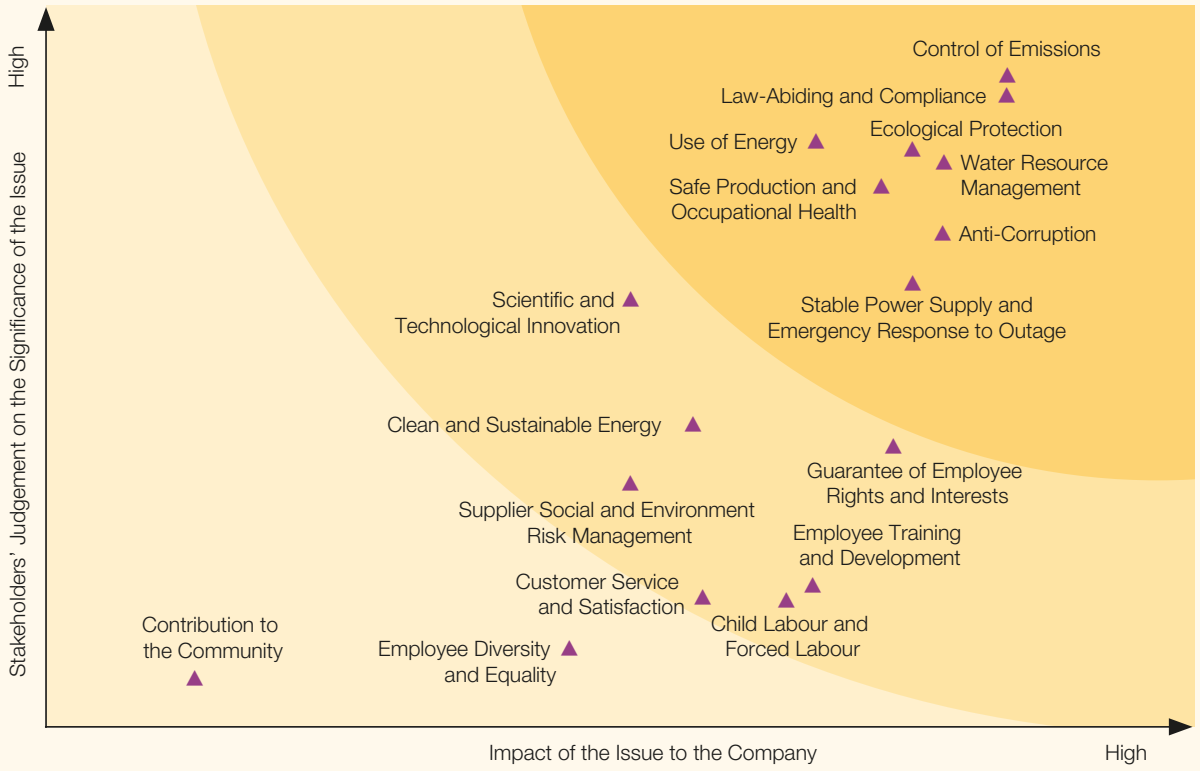
1. Identifying relevant issues: sources of issues include Environmental, Social and Governance Reporting Guide of HKEX, GRI Sustainability Reporting Standards (《可持續發展報告指南》) and matters disclosed by domestic and international peers.

2. Prioritising issues: internal stakeholders, when it comes to prioritisation, mainly consider impacts on the Company's strategies, policies, processes and objectives, on the Company's competitive advantage and management excellence, and the Company's current and future financial status; external stakeholders, with respect to prioritisation, largely focus on the extent to which a certain issue has impacts on assessment and decision-making of the Company as well as on its own interests.

3. Deliberating: the Company management assesses and approves identified issues and their prioritisation.

4. Reviewing: after the end of one reporting period, the Company will request internal and external stakeholders to provide feedback on the contents of this report to enhance future disclosure.

Following our communication with various stakeholders, the Company has identified the following issues as well as their respective priorities.



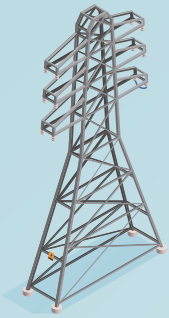
Grading Standard:

- According to their own degree of concern, internal and external stakeholders grade different issues in accordance with their importance.

Chart Description:

- Horizontal Axis: Internal stakeholders' grading for each issue
- Vertical Axis: External stakeholders' grading for each issue

CHINA NETWORK



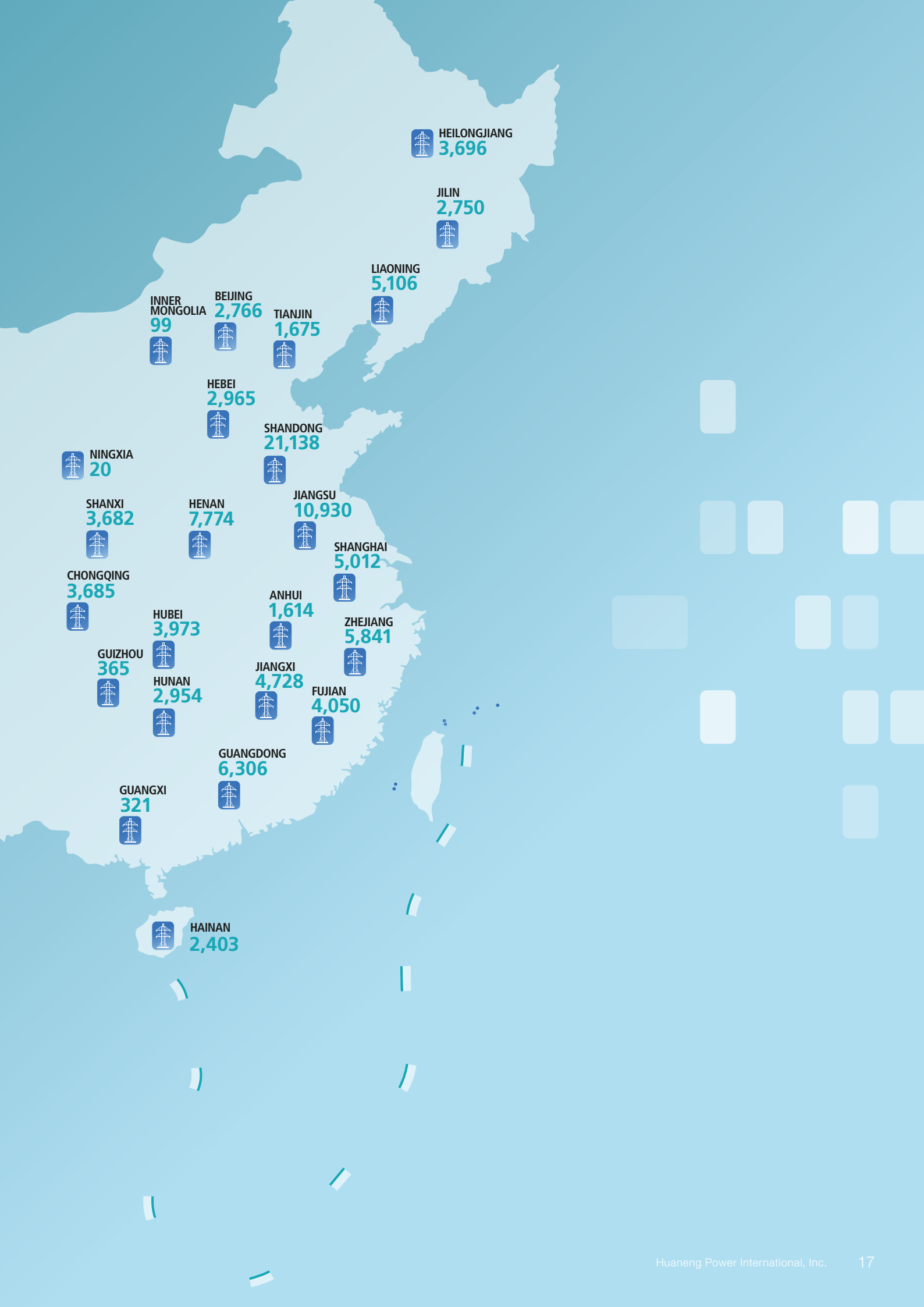
DISTRIBUTION OF POWER PLANTS OF THE COMPANY

The controlled installed capacity of the Company as at 31 December 2020 was 113,357 MW, distributed in areas as depicted in the chart (Unit: MW)

GANSU
3,697

YUNNAN
3,800

OVERSEAS NETWORK


HEILONGJIANG
3,696
JILIN
2,750
LIAONING
5,106
INNER MONGOLIA
99
BEIJING
2,766
TIANJIN
1,675
HEBEI
2,965
SHANDONG
21,138
NINGXIA
20
SHANXI
3,682
HENAN
7,774
JIANGSU
10,930
SHANGHAI
5,012
CHONGQING
3,685
ANHUI
1,614
HUBEI
3,973
ZHEJIANG
5,841
GUIZHOU
365
JIANGXI
4,728
HUNAN
2,954
FUJIAN
4,050
GUANGDONG
6,306
GUANGXI
321
HAINAN
2,403

03

Thoroughly Pushing Forward Energy Reform

Since the reform in March 2015, the National Development and Reform Commission ("NDRC") and the National Energy Administration ("NEA") have worked with local governments and electricity-generating companies to push forward the reform, open up utilisation of the electric power and liberalise the electric power market, the electricity market reform has entered into a heated phase.

In 2020, NDRC and NEA issued the Notice on Signing Medium and Long Term Electric Power Contract in 2021 (《關於做好2021年電力中長期合同簽訂工作的通知》) and specified the medium and long term contracts be subject to "Six Signings[7]" requirements, particularly, the requirement on negotiating the quantity and price of electricity by period. This paved a practical path for the implementation of energy supply and consumption revolutions, and promoted further develop electric power system reform.

As one of the most influential enterprises in the electric power industry, Huaneng International will lend its full support to national policies and work conscientiously for arrangements concerning the Central Economic Work Conference and various government work reports by enhancing communication with electric power end customers, entering strategic cooperation and jointly promoting the energy production and consumption reform to build an energy system featuring clean energy, low-carbon emission, safety and efficiency.

Our Targets

Against the backdrop of the reform of the electric power industry, the scope of business of Huaneng International has been expanded to cover the generation and sale of electricity, and the Company will strive to create a healthy and sustainable market environment. On the generation side, our specific targets are maintaining a traded amount of electricity no less than the generation capacity and keeping electricity trading prices as high as possible and no lower than the market average. On the sale side, our specific targets are to sell all electricity generated and keep electricity selling prices as high as possible and no lower than the market average.

Management Mechanism

In 2020, in light of the new developments and new requirements of the current market-oriented reform of the electric power industry, the Company established an operation centre in the electricity spot market to manage the bidding and quotation of power plants to comprehensively improve its competitiveness, responsiveness and profitability for better coping with the fierce market competition.

[7] Six Signings refer to full signing, long-term signing, authenticated signing, signing by period, standardised signing and electronic signing.

Management Measures

To further respond to power system reforms as well as providing greater support for trading decision making reasonably and efficiently, the Company has taken the three measures below:

Firstly, we actively improved our understanding of the government's requirements on the electric power system reform and closely monitored the direction of the reforms of the economic system and electric power system. We also enhanced the policy tracking and research efforts and adjusted our strategies as to installation structure and business development to benefit from the synchronisation effect. We not only solidified and expanded our market share but also innovated and enhanced our market competitiveness, thereby improving profitability and sustainability capability.

Secondly, we organised business training concerning electricity distribution, spot, etc., which improved the overall quality of our employees; we also provided four sessions of spot market training for units located at non-pilot regions for spot, the trainings took place at the units located at pilot spot regions, so as to foster talents for the spot market trade.

Thirdly, we conducted monthly climate predictions to formulate and adjust our power generation and trade strategies according to movements of temperature and precipitation over the country, thereby improving the accuracy and rationality of our supply and demand prediction.

04

Strengthening Performance of Duties

Adhering to the target of "developing itself into an international leading power generation listed company", the Company actively makes stable progress and takes practical actions to accomplish the tasks of "Six Stabilisations" and "Six Guarantees"[8] raised by the state. The Company has established and improved its power supply assurance mechanism to practically ensure the supply of electric power; it has responded to COVID-19 epidemic with all efforts and taken active measures to carry out resumption of work and production. The Company has gradually enhanced its internal management and continuously implemented its organisational reform, so as to improve its capability in compliance driven governance in a constant manner.

4.1 Ensuring Power Supply

Huaneng International is committed to developing itself into an international leading power generation listed company and providing sufficient, reliable and environmentally friendly power and high-quality energy services for the customers. Each of the Company's power plants has put in place contingency plans and response measures to ensure a safe and stable power supply.

Establish a Policy Guarantee Mechanism

In accordance with the Company's emergency management measures for major incidents and accidents and the contingency plans for major production accidents and large-scale blackouts in case of accidents such as power units tripping, alternating current and direct current power outages, bus bar outages and large-scale power grid outages caused by system collapses, all units of the Company have formulated Emergency Plan for Thorough Power Failure (《全廠失電應急預案》), Emergency Plan for Black Start (《黑啟動應急預案》), Plan for Island Operation (《孤島運行方案》) and other preparatory measures and established corresponding emergency handling organisations in order to minimise negative impacts on society. These include unified leadership, clear division of labour, rapid response and fluent communication upon occurrence of accidents. Besides, the Company and subsidiaries will also manage accident report to power dispatch department and offices of local governments, handle examination and approval of information disclosed to the public, start emergency measures and be attentive to public concern. We put in rescue control measures with inspection, prevention and repair of power outage to ensure timely recovery of power generation and resumption of power supply.

Strengthen Equipment Daily Management

The Company has focused on its equipment and technology transformation management to ensure that equipment is safe to use, reliable and advancement. The Company has been pushing ahead with the work of "reducing deficiencies and controlling unplanned power outages", strengthening generator units' unplanned power outage control with the unplanned power outage control as a breakthrough point, issuing unplanned power outage analysis report and conduct related monthly performance reporting. The Company initiated equipment management and risk investigation for several power plants, as well as project planning and process quality inspection for Grade A/B[9] overhauling units to enable full process management of reliability indicators for the main engine and key auxiliaries. We also strengthened technical supervision and management, conducted site evaluation and stepped up efforts in technology transformation projects to constantly improve equipment health and ensure the safety of equipment and our staff.

As of 31 December 2020, the Company has been achieving an average 0.19 times of unplanned outages per unit per year. No unplanned outages were recorded throughout the year in 47 power plants, including Haimen Power Plant and Laiwu Power Plant. 7 generator units, including Yuhuan No.4 and Shang'an No.2, were shortlisted for the advanced units of power reliability.

Strengthening the Guarantee of Heating Safety

With earnest implementation of the requirements of China and industry regulators on heat supply as well as the 25 key requirements for preventing power production accidents, the Company carried out comprehensive inspection and elimination of equipment hazards and defects and reasonably made arrangement for the overhaul, inspection, test and cleaning of main equipment, auxiliary equipment, protection and safety automatic devices, while strengthening the inspection and maintenance of important heating equipment, heating pipeline, heating stations and heating pipe network and making reserve for spare parts and emergency materials.

[8] Six Stabilisations refer to stabilisation of employment, finance, foreign trade, foreign capital, investment and expectation; Six Guarantees refer to providing guarantee of domestic employment, basic livelihood, market players, safety of food and energy, stable industry and supply chains, and operation of grassroots units

[9] A/B: Grade A maintenance is a comprehensive disassembly inspection and repair of power units to maintain, restore and improve equipment performance; Grade B maintenance involves the conditional and targeted implementation of some of the Grade A maintenance work based on power units' equipment status, system properties and operating conditions.

In addition, the Company also applied the following measures to strengthen the guarantee of heating safety.

01 **Enhancing the management of boiler fuel.** We formulated specific plans for fuel procurement, storage and transportation, optimised plans for mixed burning of coal and improved the measures for low-load and stable burning, so as to ensure steady operation of power units.

02 **Ensuring personnel safety in heating production.** With improvement to the accountability system, regulations and operating instructions related to production safety, we enhanced safety education and training for relevant personnel, provided inspection equipment and protective materials, and organised drills for emergency rescue.

03 **Attaching great importance to management of direct heating network.** We maintained the normal operation of the heating network by conducting routine management of heating network equipment, ensuring sufficient reserve of materials and human resources, timely eliminating the defects of heating network equipment and pipes, and focusing on the operation and management of water replenishing for heating network.

04 **Being well prepared for heating emergency.** We improved our capabilities of dealing with disastrous events by preparing emergency heating measures in advance, formulating emergency plans in case of outage of heating equipment, quickly identifying, treating and recovering failure equipment, establishing emergency plans for personal injury and death accidents, and enhancing the communication between local government and heating companies.

05 **Strengthening the on-duty work of heating.** We strengthened the policy of personnel on duty on holidays, executed the policy of major operations with the attendance of leaders. We reported the operation of heating units in a regular basis and reported the heating emergencies in a timely manner.

06 **Enhancing the awareness of heating services.** By taking the initiative to find out the outstanding heating issues raised by our people, we gained understanding of their demands, and resolved the issues effectively.

Successfully Coping with Natural Disasters and Extreme Weather

In 2020, the subsidiaries of the Company worked together to overcome severe tests from natural disasters, and successfully accomplished the task of ensuring power supply in this crucial period. The Company managed to keep its system steady with safe production. The Company has attached importance in the improvement of its capabilities of quick response to disastrous events and has always been ready for flood prevention and control. In 2020, facing the serious flood situation in the mainstream of the middle and lower reaches of the Yangtze River as well as the whole area of Hubei and Hunan, the Company issued the Notice on Implementation of General Secretary Xi Jinping's Crucial Instructions for Flood Prevention and Control (《關於貫徹落實習近平總書記重要指示精神全力做好防洪度汛工作的通知》), urging to enhance the awareness and carry out all necessary work to get through the flood safely. Subsidiaries in relevant areas like Hubei and Hunan quickly activated emergency plans, maintained close contact with local emergency management agencies and strengthened their on-duty work for emergency. Finally, the dangerous situation was responded successfully.

Being well prepared for the flood, Yangluo Power Plant paid close attention to the flood situation of Yangtze River and took active measures to prevent flood disasters. It organised a commando to carry out 24-hour patrol along the Chaibo Dike, and reported and dealt with several suspected seepage sites. With its work being highly recognised by the Flood Control Headquarters of Xinzhou District, Yangluo Power Plant successfully fulfilled its 27-day duties for river and dike flood control.

For the first time, the power plants affiliated to Liaoning subsidiary, Jilin subsidiary and Heilongjiang subsidiary responded to the emergency that Typhoon Bavi, Typhoon Maysak and Typhoon Haishen successively invaded the Northeast hinterland. With the scientific organisation and active response from the involved units, the damages caused by the typhoons were effectively reduced.

Strengthening Intensification of Inspections Along Dykes and Dams

Equipment Repairing before Typhoon

Resolutely Ensure the Supply of Electricity and Heat During the Epidemic

The unexpected COVID-19 caused great impact on the Company's production, operation and development. In order to ensure production safety and stability, the Company organised each department to take active measures. The Company implemented epidemic prevention measures in respect of operating personnel work rotation, maintenance personnel allocation, block management within plant, disinfection and cleaning, sanitary protection, dining management, guarantee of epidemic prevention materials for production, and cares for employees. It also strengthened its on-site management for equipment maintenance, power unit overhaul and technological transformation, and made full use of power unit rotation and holiday time to carry out separate overhaul to objects at all level. This assured that a certain rate of power units could be available and spare power units could be ready for use whenever they are needed to ensure the capacity of power generation. During the epidemic, the power generation subsidiaries of the Company operated normally to provide safe and sound supply of power and heat, and hence contributed to the epidemic prevention and control work of China.

Hubei subsidiary – Prevention and Control of Epidemic & Resumption of Work and Production

Hubei subsidiary put in control measures on the epidemic prevention and control with production safety. In terms of epidemic prevention and control, Hubei subsidiary placed employees' health and life safety as the top priority. With focus on daily prevention and control work, Hubei subsidiary cared for its employees and made full effort to relieve their "post epidemic syndrome", and carried out practical psychological counselling for the employees. For production safety, Hubei subsidiary applied practical measures in respect of personnel and technology, and orderly pushed forward the resumption of work and production in the grassroots units of Yangluo Power Plant, Jingmen Thermal Power Plant, Yingcheng Thermal Power Plant, etc. With the hard work of its employees of Hubei subsidiary, the utility hours of its coal-fired generator units ranked No. 1 in the power generating group of Hubei Province from January to April 2020, despite the extreme difficulties. Yangluo Power Plant, one of the largest thermal power plants in Hubei Province, holding 54% of Wuhan's power units, successfully accomplished over 120 tasks of standby shut-down and defect elimination for 4 power units, and ensured its 6 power units could be put into stable use whenever they are needed in crucial times. As at the end of April 2020, facing the electricity demand plunge in Hubei Province, Yangluo Power Plant achieved a cumulative power generation of 2,984 million kWh, with its No. 3 power unit setting a record of long cycle safe operation non-stop for 300 days.

A Meeting on Epidemic Prevention and Control

Successfully Completed Energy Supply Work During Major Events

To cope with the need for stable power supply of local governments for major state-level events and social events, the Company's regional branches cooperated with electricity users and power transmission and distribution companies under the coordination and instruction of local subsidiaries to develop special power supply plan, so as to improve service capability during these events. The National People's Congress (NPC) and the Chinese People's Political Consultative Conference (CPPCC) took place in Beijing from 22 to 28 May 2020. Units in Beijing, Tianjin, Hebei and the surrounding areas attached great importance to the supply of power and heat and air quality assurance. We successfully accomplished the tasks of of stable supply of power and heat and assuring air quality during the important period when the NPC, CPPCC and other important meetings were held. During the period, we actively organized the operation of power units, seriously carried out equipment overhaul, maintenance and defect elimination, and strictly implemented reduction in use of highly polluted operation such as restricting using diesel trucks, avoiding peak hour transportation and various emission measures during period of these important events.

In addition, at the beginning of the year and during the Spring Festival and other key periods, the Company implemented various measures to assure production safety, so as to ensure the safety and stability of power production.

01 **Performing safety management for operating power units.** Learning from the internal and external production safety accidents, we seriously implemented the policy of "Two Tickets and Three Systems"[10], strengthened operation management and routine inspection, improved equipment defect management and attached great importance to equipment defect elimination.

02 **Strengthening the management of external supply of heating and steam.** By earnestly implementing various measures of the Company, we enhanced the inspection and maintenance on heating equipment and heating pipe network and improved relevant emergency plans and early warning mechanism.

03 **Attaching great importance to fuel support.** Giving priority to ensuring people's livelihood and supply, we took into account the price control and effectively enhanced allocation and transportation, so as to ensure the supply.

04 **Enhancing allocation and transportation.** We managed to match the resources with the transport capacity and made arrangement for urging of delivery and shipment. Considering the potential adverse effects of extreme weather on transportation, we made application for green channel support to local traffic management department in advance.

05 **Continuing the epidemic prevention and control.** We strengthened the epidemic prevention and control in production, and adhered to the implementation of all precautionary measures, so as to guarantee for the life and health of employees and ensure stable and orderly conduction of routine production work.

4.2 Operating in Compliance with Laws and Regulations

Huaneng International continuously enhanced its anti-corruption efforts, insisted on clean and honest business practice, and established a law-abiding corporate governance. We closely monitored new changes in regulatory laws and regulations in the place of listing to grasp the regulatory trends and effectively implement the new regulatory requirements. The Company was committed to operational compliance, regulated operation to continually improve its risk prevention ability and corporate governance, and build a corporate culture that values integrity and compliance.

4.2.1 Management by Law

In 2020, upholding Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, the Company comprehensively promoted its legal and compliance management. The Company strictly complied with relevant policies, making major decisions in accordance with laws and regulations, and made favourable achievements.

[10] Two Tickets refer to work ticket and operation ticket; Three Systems refer to the system of work rotation, the system of itinerant inspection and the system of regular testing and replacement of equipment.

Strengthening the Legal Research and Demonstration on Major Projects

Valuing the ideas and ways of law in resolving issues of reform, the Company worked well in legal review in respect of asset disposal and capital operation. The Company focused on the legal research, review and demonstration related to reform measures and special work like energy project development and acquisition, industrial structure adjustment, disposal of "zombie companies" and governance of destitute enterprises. Meanwhile, it paid attention to the adjustment of interest pattern and the reconstruction of legal relationship to ensure that all projects could be operated in a standardised and stable manner on the track of law.

Optimising Authorisation Management Model

In order to further strengthen the authorisation management of the Company and its regional subsidiaries and grassroots units, as well as to standardise the authorisation and exercising of rights and enhance supervision and assessment, the Company formulated the Measures for Authorization Management (《授權管理辦法》) in early 2020. The measures clarified the principles and scope of authorisation management, and specified requirements on the measures and contents of authorisation, approval procedures for authorisation, management of authorisation letters and the fulfilment, accountability, supervision and assessment of authorisation. With internal control inspection, filing for execution of authorisation and other measures, the Company enhanced its legal supervision and business supervision mechanism for the execution of authorisation.

Enhancing the Basic Work of Law

The Company promoted the thorough integration of legal affair management and operation management to ensure mutual cooperation and efficient coordination between the legal affair department and other business departments and regulate the working process. While comprehensively improving its ability of legal review in major decision making, regulations and systems, legal authorisation and business administration, the Company continuously perfected its approval procedures for contracts and various legal documents and gave full play to the important role of "prevention in advance, control in the process and remedy afterwards". In 2020, the legal review rate of all kinds of contracts and agreements was 100%.

Carrying out Diversified Activities for Popularisation of Law

Following the legislative process, the Company opened up a "Law Column" on its website. In a timely manner, new law briefings would be prepared according to the Company's business needs and uploaded to the column for employees to learn and exchange. In recent years, with diversified and detailed contents in the column, the Company introduced the Securities Law of the People's Republic of China (《中華人民共和國證券法》), the Provisions of the Supreme People's Court on Several Issues Concerning the Application of the Company Law (V) (《最高人民法院關於適用公司法若干問題的規定(五)》), the Law of the PRC on Foreign Investment (《中華人民共和國外商投資法》), the Measures for the Supervision and Administration of the Investments by Central Enterprises (《中央企業投資監督管理辦法》), the Measures for the Supervision and Administration of Overseas Investments by Central Enterprises (《中央企業境外投資監督管理辦法》) and other laws and regulations to the employees.

In 2020, the Civil Code of the People's Republic of China (《中華人民共和國民法典》) was issued. In firm response to the demands of popularisation of law, the Company carried out diversified activities for popularisation of law. The legal affair department formulated and issued the Letter of Introduction to the Civil Code of the People's Republic of China and Legal Instructions on Relevant Articles (《關於<中華人民共和國民法典>簡介及相關條款的法律提示函》), suggesting that the headquarters departments shall pay enough attention to potential risks arising from the implementation of the Civil Code of the People's Republic of China (《中華人民共和國民法典》) and conduct risk prevention in advance, so as to protect the legitimate rights and interests of the Company. Meanwhile, the Company distributed the book version of the Civil Code of the People's Republic of China (《中華人民共和國民法典》) (Practical Version) to the employees for reference in their daily work, so as to truly follow the code and abide by the law.

4.2.2 Anti-corruption

In 2020, strictly complying with the Supervision Law of the People's Republic of China (《中華人民共和國監察法》), the Regulation of the Communist Party of China on Disciplinary Actions (《中國共產黨紀律處分條例》), the Work Rules for the Discipline Inspection Organs of the Communist Party of China on Supervision of Discipline Enforcement (《中國共產黨紀律檢查機關監督執紀工作規則》), the Criminal Law of the People's Republic of China (《中華人民共和國刑法》) and other laws and regulations, the Company rolled out anti-corruption campaigns, in the spirit of "Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era" and the spirits of the 19th National Congress of the Communist Party of China, the Second, Third, Fourth and Fifth Plenary Sessions of the 19th Central Committee of the CPC, we urge all employees to uphold ethics as well as Party disciplines and state laws and create an atmosphere where everyone remains disciplined, abides by the law, discharges duties in a standardised fashion, and practices clean operation so as to provide a solid political, ideological and organisational support for the Company's sustainable business development.

In 2020, the headquarters and affiliated units of the Company had no violations that would cause significant impact. The number of lawsuits on corruption raised and concluded against the Company or its employees was zero.

Corruption Punishment and Prevention

In order to prevent corruption, bribery and other acts of the sort, Huaneng International has been stepping up efforts to promote clean governance.

01 The Company strictly effectuates responsibility system for the establishment of an incorrupt party, and party members of each level give a written undertaking thereof to establish accountability.

02 The Company rigidly implements stipulations within the spirit of the "eight-point" guideline (the "Eight-point Guideline") and the implementation rules issued by the Central Government, as well as Requirements on Further Implementation of the Eight-point Guideline for Enhancing the Development of Good Work Practices (《關於深入貫徹落實中央八項規定精神進一步加強作風建設的若干規定》) issued by Huaneng Group.

03 The Company pays special attention to the handling of complaints received in letters or visits or those handed over by the inspection team of the Central Government to timely process and respond to related matters and protect the informant's legal rights.

04 The Company will thoroughly implement General Secretary Xi Jinping's crucial instructions and organise special inspections to firmly resist wasting of food and beverage.

05 The Company will continue to release a strong signal that discipline must be strictly enforced, and seriously investigate and punish cases of violation of discipline and law, so as to enhance the deterrent of discipline. Meanwhile, the Company will carry out relevant work in respect of finding clues, providing feedback, clarifying rumour and caring for punished Party members, and cancel the charges on those being accused of by mistake.

Improving Policy and Enhancing Inspection

Improving the main policies and measures. Regarding the common issues existing in the use and management of seven categories of fees including travel expenses, staff welfare, entertainment expenses, labour protection expenses, employee education funds, labour union expenditures and party membership dues, etc., the Company formulated 51 guidelines for the management and use of the seven categories of fees and a negative list containing 64 items, and made explanation to 122 issues concerning management and policies, providing basic guidance for making standard use of the seven categories of fees in the whole system.

Conducting special inspection. With further implementation of the Opinions for the Implementation of Corruption Prevention and Control for Overseas Projects (《境外項目廉潔風險防控實施意見》), the Company carried out special rectifications for overseas corruption, benefit transfer, grasp of profits with power and embezzlement of public property, and conducted investigation on the execution of disciplinary actions to ensure full execution.

Thoroughly conducting quality assessment of cases and random inspection of inquiries. The assessment and inspection were carried out with focus on whether standards were strictly followed in the conversation inquiries, whether the conversation inquiry procedures were appropriately performed and whether the achievements of conversation inquiry were fully applied, etc. The Company analysed the conversation inquiries under progress or settled in respect of processing standards, work procedures, processing time limits, material review and subsequent work, and achieved favourable results. Meanwhile, each unit's suspect clues were reviewed, and quality of case handling was evaluated, which significantly improved the quality of case handling.

Conducting disciplinary dialogue. With earnest implementation of the Measures for Implementation of Disciplinary Interview under "Four Situations" (《實行「四種形態」下紀律談話實施辦法》), the Company practically carried out daily interviews to urge and remind the Party leaders to seriously comply with the Party's constitution, rules and discipline, as well as various rules and regulations of the Company.

Opening Channels for Complaints

The Company has offence reporting hotlines and emails, opens channels of handling complaints expressed in letters or visits, welcomes letters and visits, regularly collects, analyses clues reported by all units that have to do with corruption, bribery and other undisciplined or unlawful cases. We organise the remediation for formalism and bureaucratism in handling complaints expressed in letters and have formulated and implemented 19 rectification measures.

Actively Organising Training and Education

The Company uses the Internet and other media to mobilise the study of course CDs and handouts of the Central Commission for Discipline Inspection (CCDI), and compiles self-test questions, stimulating the fervour of "competing in learning, business, and practice" in the Company's discipline inspection system. We organise unified tests. More than 600 full-time and part-time discipline inspection personnel and other officers participated in the training and testing organised by the discipline inspection and supervision team, achieving good results and effect. Discipline inspection commissions at all levels organised more than 150 examinations independently. We carry out trainings by using course CDs and handouts of CCDI and have organised more than 120 disciplinary inspection and supervision officers to attend training courses, in an effort to promote professionalism of discipline inspection officers.

We intensify anti-fraud training for employees to strengthen their awareness about harmfulness and potential significant impacts of fraud behaviours to the Company and individuals and enable them to better identify fraud behaviours and characteristics. We have organised 117 trainings throughout the year, covering 27,640 person times.

The Company provides disciplinary education, cautionary education, video and cautionary tales to Party members and push them to learn from existing cases. And carry out special inspections so to enhance management. We have compiled and printed 132 cases relating to violations of disciplines and laws in 8 aspects including the "Four Malfeasances" (formalism, bureaucratism, hedonism and extravagance) and procurement bidding, and release the Disciplinary Alert (《紀律之窗》), an electronic publication, to the chiefs of the Company. The publication collected over 140 articles on the clarification of Party regulations and disciplines, policy explanations and typical cases to help Party leaders to stay alert and disciplined.

4.2.3Protection of Intellectual Property Rights

Strengthening the patent strategy is an important measure to implement decisions and arrangements of General Secretary Xi Jinping and the CPC Central Committee, and to build China into an international power in intellectual property rights and technological innovation. In order to implement decisions and arrangements of State-owned Assets Supervision and Administration Commission ("SASAC") and the Company, the Company has formulated the guiding opinions for improving patent quality based on our demand for high-quality development and actual technological innovation development, which aims to significantly improve the patent quality and further enhance innovation capability. Under the guiding opinions, the Company carries out special work on patent improvement and takes targeted and key measures as an important way to achieve high-quality development and enhance core competitiveness. The Company has formulated the Measures for the Management of Technological Intellectual Property Rights (《科技類知識產權管理辦法》) to further standardise the management, development, use and protection of technological intellectual property rights, and promote the formation and transformation of technological innovation and independent intellectual property rights.

In 2020, the Company strictly followed the Patent Law of the People's Republic of China (《中華人民共和國專利法》), the Copyright Law of the People's Republic of China (《中華人民共和國著作權法》), the Trademark Law of the People's Republic of China (《中華人民共和國商標法》) and other laws and regulations of China, and received no punishment or lawsuit from the government for intellectual property infringement.

Formulating Patent Improvement Measures

Patent quality is an important symbol to measure technological innovation. The head of each secondary unit division and the chief engineer take the lead in establishing a special working group to explore the establishment of a responsibility system for technological innovation headed by the chief engineer, and refine and implement various patent indicators, deeply integrating the patent work with scientific research, planning, infrastructure and technical transformation of production, and formulating patent improvement measures appropriate to the Company.

Strengthening Training for Intellectual Property Rights

We organise patent work trainings within the system to improve the patent application knowledge of frontline employees and guide all units to achieve Industry-University-Research-Practice cooperation, in an effort to promote joint application, ownership and use of patents.

Protecting and Maintaining Intellectual Property Rights

Legal Department of the Company takes the lead in strengthening the protection and maintenance of intellectual property rights, requires all units to pay attention to the protection of intellectual property rights of core technology and technical secrets, and prudently decide on the transfer and licensing of core intellectual property rights, in an effort to enhance all-round management of core technical secrets, and reinforce competition restrictions on key talents knowing the Company's core technology secrets. We establish and improve the coordination mechanism between intellectual property rights agencies and Legal Department of the Company so to better deal with disputes arising from intellectual property rights.

Strengthening the Management of Patent Information

We establish a patent information management system covering the whole process. Starting from the patent application, we strictly manage and maintain the dynamic patent information in the system, and link all patents to relevant project, realising full tracking management throughout the life cycle of patent application, authorisation, maintenance, achievement transformation and invalidation.

05

Green Development Driven by Innovation

As a responsible company, Huaneng International strongly promotes ecological development, vigorously develops clean energy, continuously optimise the industrial strategic plan, actively engages in technological innovation, strengthens environmental protection, maximises energy efficiency, and boosts the development of the green management system, so as to promote the green development of the Company.

5.1 Developing Clean Energy

"Innovation, coordinated development, green growth, open economy and shared development" are the five key development concepts of our country. The Chinese government's response to climate change has been accorded as a major strategy for national economic and social development to advance eco-civilisation, develop a green economy and earnestly promote various emissions reduction measures as core climate change policies.

The "13th Five-Year Plan" period signified the final stages of implementing the policy of building China into a moderately prosperous society as well as the start of a new normal in China's economic and social development. It was also a crucial period for developing Huaneng International into a world-class listed power generation company. In the meantime, Huaneng International redoubled its efforts to promote the development of low-carbon and clean energy with continuously improving the development quality, and advanced business transformation and upgrading by introducing low-carbon and clean energy power units. We proactively adapted to the development of the power generating industry and achieved substantial results in accelerating green development.

Optimising the Energy Structure Constantly

During "13th Five-Year Plan" period, Huaneng International focused on promoting low-carbon clean energy development, and continuously improved the proportion of installed capacity of low-carbon clean energy. By 2020, the Company boosted its low-carbon clean energy installed capacity to above 20%. The Company's main development directions for "14th Five-Year Plan" include:

01 **Vigorously Developing New Energy:** Adhering to the principle of "adopting centralisation and decentralisation, complementing incremental development with acquisition, focusing on self-sustaining development and advancing together through cooperative development", we leverage our favourable advantages for the centralised development of new energy in the "Three-North" (north-eastern, northern, north-western regions), coastal, south-western and part of central areas of China to further build a large-scale clean energy base featuring "service, sharing and innovation, as well as standardisation, efficiency and branding". We construct offshore wind power development zones along the eastern coasts gradually expanding into the deep sea. In coastal areas, we launch a group of centralised onshore wind power and photovoltaic projects by effectively utilising land resources such as ecological agricultural and industrial use land. We build a comprehensive energy plant with ten million kW capacity exporting to Zhejiang in the north of Shanxi province and construct plain wind power contiguous development zones in combination with the power consumption space in the area along the Yellow River in Henan province. We actively plan a new model of scattered and distributed development, promote decentralised and contiguous development of wind power by utilising low-altitude grasslands, low mountains and hills and other low-wind speed areas, and build distributed photovoltaic projects by taking advantages of urban buildings, factory and mine workshops, roofs of industrial park, mudflat salt land, "photovoltaic agriculture" and "photovoltaic fishery", etc.

02 **Optimally Developing Natural Gas Power Generation:** We focus on developing gas power generation projects in areas with confirmed gas sources and gas price, strict environmental protection requirements, strong bearing capacities for electricity price, and large peak load distribution demands. In areas with large installed capacity of gas turbine, we comprehensively consider the integrated development mode of gas and electricity by utilising existing pipeline natural gas and LNG receiving stations and self-built LNG receiving stations, or by way of cooperative development with upstream gas suppliers.

03 **Steadily Developing Pumped Storage Power Station:** Focusing on combining with the peak load distribution demand of the receiving end of the clean energy bases and utilising relevant policies of the State that support the development of pumped storage, we put efforts to strength cooperation with power grid enterprises in areas with mature ancillary service markets and peak-valley electricity prices by taking regional companies as the main body and giving full play to the role of professional companies, forming a business model of mutual benefit and promoting the development of pumped storage power stations and optimally planning pumped storage power stations.

04 **Striving to Participate in Nuclear Power Investment:** The Company strives to participate in nuclear power investment and does well in site protection and resource reserve while taking a large proportion of shares in Hainan Changjiang Nuclear Power Plant Phase 1, Shidao Bay Nuclear Power Plant and Xiapu Nuclear Power Plant.

05 **Exploring Other Forms of New Energy:** We will actively seek investment cooperation and opportunities for merger and acquisition of properties of renewable energy power generation. We build biomass power units in combination with citizen's heat supply. We develop energy storage industry according to local conditions, combining with the development of new energy and the requirements of regional peak load distribution. We optimally launch comprehensive energy supply and service stations such as distributed energy, microgrid, etc.

Developing Clean Energy Vigorously

The Company gives priority to quality and benefit, pays equal attention to independent development and acquisition, and strives to gain resources that match its market share. The Company continues to focus on green development, vigorously develops new energy and optimally promotes gas power and other clean energy power generation. Besides, the Company actively implements major regional strategies of the State such as Guangdong-Hong Kong-Macao Greater Bay Area, Yangtze River Delta and Beijing-Tianjin-Hebei, to integrate into the new development pattern.

Huaneng Dafeng Offshore Wind Farm

The Huaneng Dafeng Offshore Wind Farm is located in the Maozhusha waters at Dafeng District, Yancheng, Jiangsu, and the farthest offshore wind farm in China. On 29 September 2019, Huaneng Dafeng 300 MW Offshore Wind Farm (Phase 1) officially commenced its grid-connected operation, with 68 sets of wind turbines, including 48 sets of 4.2 MW unit and 20 sets of 5.0 MW unit. On 28 April 2020, Huaneng Dafeng 100 MW Phase 2 was successfully put into operation for power generation with 23 sets of 4.5 MW wind turbine units.

By the end of 2020, the accumulated power generation capacity of Huaneng Dafeng Offshore Wind Farm amounted to 927 million kWh with 2,501 utilisation hours. It is expected to save 31.6 ten thousand tons of coal equivalent and reduce 69 ten thousand tons of carbon dioxide emission, 12.67 ten thousand tons of fly ash. In addition, it can save 303.07 ten thousand cubic meters of water per year and reduce corresponding wastewater discharge, generating significant environmental benefits. The successful operation of the project demonstrates our implementation of the strategy of green and sustainable development, and promotes the development of local economy, generating good social, comprehensive economic and environmental benefits. Huaneng Dafeng Offshore Wind Farm demonstrates the Company's commitment to promoting the transformation of local energy structure and accelerating industrial upgrading.

Dafeng Offshore Wind Farm

5.2 Enhancing Innovation Capability

Technological innovation drives business development. Huaneng International is committed to developing itself into an innovation-driven enterprise by improving technological innovation, continuously enhancing our innovation capability, earnestly investing in research and development, optimising the systems for innovation decision making and management, and relentlessly developing innovation platforms to accelerate the development of the Company.


中国电力科学技术奖

获奖证书

奖项名称：中国电力科学技术进步奖

获奖项目：海上风电风能高效利用与低冗余高可靠性柱基关键技术及应用

获奖等级：一等

获 奖 者：华能国际电力股份有限公司江苏清洁能源分公司

奖励年度：2020年

发证机构：

证书编号：2020-J-1-05-D01

Innovation Management

In accordance with the Law of the People's Republic of China on Scientific and Technological Progress (《中華人民共和國科學技術進步法》) and other innovation policy incentives of various local governments, Huaneng International revised a series of relevant rules and regulations, including Regulations on the Management of Scientific and Technological Work (《科技工作管理規定》), Measures for the Management of Science and Technology Projects (《科技項目管理辦法》), and Measures for the Management of Technological Intellectual Property Rights (《科技類知識產權管理辦法》) to effectively manage the whole process of intellectual property rights and science and technology projects. At the same time, Huaneng International formulated the Measures for the Management of R&D Funds (《研發經費管理辦法》) in line with the requirements of the Company on increasing R&D investment, which focuses on major national needs and leads the technological advance of the industry and the Company's development needs of safe operation, to support the Company's high-quality development. Huaneng International is determined to realise demand-led growth through innovation, strive for short-term results and long-term goals, and capitalise on technological support and advancement. We drive technological innovation alongside our company systems and mechanisms while maintaining autonomy and seeking cooperation in innovation for higher efficiency.

In 2020, Huaneng International was committed to serving the national strategy and promoting innovative development with active investments in research and development, to ensure the implementation of major science and technology projects such as "Key & Core Technology".

Firstly, we actively promote major national science and technology R&D programmes. Among which, the "Key Technology of New High Alkali Coal Wet Bottom Boiler" has passed the mid-term acceptance inspection organised by the Ministry of Science and Technology (MOST). The "700℃ High-efficiency and Ultra-supercritical Power Generation Technology" has been implemented speed up as planned goal. The project of "Optimal Design of Large-scale Offshore Wind Turbines and Key Components and Key Technologies for Mass Manufacturing, Installation, Debugging and Operation" was conducted to complete the fault identification of doubly fed offshore wind turbines and determine the fault-tolerant operation scheme. Secondly, we initiated six major and key science and technology projects including "R&D of the Support System for the Company's Network Security Risk Control". The "Technological Development on Power Infrastructure Network Security", "Independent Technology of Gas Turbine Operation and Maintenance", "Super Alloy Materials" and other projects have achieved initial positive results. We initiated the project of "Development and Demonstration of 100 kW Molten Carbonate Fuel Cell Power Generation System" and developed the first domestic 100 kW Molten Carbonate Fuel Cell Power Generation Unit System with independent intellectual property rights. The project "Development and Application of National Industrialised Safety Intelligent DCS[11]" achieved a breakthrough in key core technology and was successfully put into operation in Fuzhou Power Plant and Yuhuan Power Plant respectively, demonstrating self-sustaining technical capability of China's industrial control system in power generation sector.

At the same time, the Company made efforts to strengthen the research and application of new energy-saving technologies, popularise wide load high-efficiency power generation, flexible modification of thermoelectric decoupling, and improve the independent R&D capability of energy storage and frequency modulation technology. The project "High-efficient Utilisation of Wind Energy of Offshore Wind Power and Key Technology and Application of Low Redundancy and High Reliability Pile Foundation" organised and implemented by the Company won the first prize of China Electric Power Science and Technology Award in 2020.

In 2020, the Company's R&D investment increased significantly and 433 patents were authorised during the year, including 30 invention patents.

Innovation Achievements

01 The Company continues to promote the research on the key technology of new high alkali coal wet bottom boiler, and has developed a new method for capturing Na and K in slag-tapping cyclone combustion and the combined control technology of slag-tapping low nitrogen oxide (NOx), and has passed the mid-term acceptance inspection organised by the MOST.

02 The Company accelerates the research on 700℃ high-efficiency and ultra-supercritical power generation technology, and complete the condenser heat transfer characteristic experiment, establish the dynamic analysis model of the unit, and the 700℃ test verification platform has accumulatively been running for 30,000 hours.

03 We have completed the optimal design of key components of offshore wind turbine and the failure recognition of double-fed offshore wind turbine for the offshore wind power R&D project organised by the Company and has formulated a fault-tolerant operation scheme. Application validation is now underway.

04 The Company has organised the development of a network security risk management support system. The network topology management module and vulnerability database management module designed have been put into operation.

05 The Company has conducted independent technological research on gas turbine operation and maintenance and has completed structural strength check for combustion chamber components as well as the development and application verification of non-destructive testing technology for special structural parts of the compressor. The superheater efficiency model in variable performance condition of waste heat boiler is improved, and the diagnostic criterion of combustion stability of combustion chamber is determined.

06 For the independent research and development project of high-temperature materials, the Company is carrying out alloy trial production, and completed the welding and testing by using high temperature superheat/high temperature reheater boiler tube of units. "High-temperature Coating Technology" will be put into common application in units with high parameters for the first time.

[11] DCS: distributed control system

Development Directions

Huaneng International puts technological innovation in a more prominent position according to the requirements of the Company's strategic development. Next, the Company will strengthen efforts to tackle core technologies and accelerate R&D focusing on clean combustion, high-temperature materials, network security, independent operation and maintenance of gas turbine, intellectual heat supply and other fields, so as to further improve the independent innovation capability. We will make overall plan and coordination on key projects and tasks required for the Company's production safety, infrastructure, management and development, and maintain advanced technical and economic indicators in environmental protection, materials, operation and maintenance and heat supply, forming a high-quality patent system that leads domestic and international market.

In addition, the Company will also actively promote the integration of technologies, such as carbon capture, fuel cell, AI, IOT, block chain, cloud computing and big data, with all aspects of the energy industry. With the implementation of the "Digital Huaneng, Intelligent Huaneng" strategy and the national "carbon neutrality" policy. A number of scientific and technological achievements with significant at home and abroad have been made in the field of clean and highly-efficient power generation technology. The Company will also carry out demonstration projects to expedite industrial restructuring and enhance core competitiveness.

5.3 Promoting Energy Saving and Emission Reduction

In 2020, embracing the spirit of the annual production conference, the Company carried out the rating work of units in an all-round way, promoted the energy-saving upgrading and transformation of coal-fired power, and high-quality heat supply renovation. These were implemented with the goals of improving major technical and economic indicators and realising energy consumption index's "leading positions in overall energy consumption efficiency", under the principles of improving the quality of energy management, focusing on energy consumption index benchmarking and ensuring key generator units' outstanding performance. In 2020, the Company did not incur any environmental accident that was defined as major or above grade.

5.3.1 Overall Planning

To implement the State Council's Programme of Action for the Energy Development Strategy (2014-2020) (《能源發展戰略行動計劃(2014-2020年)》) and become an industry leader in overall energy consumption efficiency and ultra-supercritical unit energy consumption efficiency, various systems of energy saving are specified by each unit of the Company according to their actual circumstances so as to carry out publicity, training, supervision and inspection in a timely manner. The Company actively promotes coal-fired power units' energy saving and emission reduction, plans to carry out energy saving and environmental protection, and has successfully fulfilled its targets and responsibilities of energy saving and emission reduction to ensure that the Company's coal-fired units continuously acted in energy conservation and environmental protection and upkept its competitive advantage, and contributed to the reform of the nation's energy production and consumption and enhanced the clean and efficient development of coal power generation.

5.3.2 Energy Consumption Management

As an advanced power company, Huaneng International strictly abides by the Environmental Protection Law of the People's Republic of China (《中華人民共和國環境保護法》), Energy Conservation Law of the People's Republic of China (《中華人民共和國節約能源法》) and other relevant laws.

The Company mainly consumes coal and natural gas in the power generation process and consumes a certain amount of oil during the start-up ignition and production combustion process. In 2020, the coal consumption rate for thermal power unit was 291.08 g/kWh. The house consumption rate of plants was 4.33%. The consumption standard coal was 11,817.11 ten thousand. Oil consumption in production totalled 29,761.39 tons, while natural gas consumption was 537,014.18 ten thousand of standard cubic metres.

Management Mechanism

In accordance with Energy Conservation Law of the People's Republic of China (《中華人民共和國節約能源法》) as well as the 2014-2020 Action Plans for the Upgrading and Renovation of Energy Saving and Emission Reduction in Coal Power Generation (《2014-2020年煤電節能減排升級與改造行動計劃》), and with the consideration of actual operations, we formulated regulations and guidance related to energy saving, such as Measures for Energy Saving Management (《節能管理辦法》), Incentive Measures for Achievement of Energy Efficiency Excellence and Enhancement in (Ultra-) Supercritical Power Units (《超(超)臨界機組能耗指標創優及能耗指標提升獎勵辦法》), Standards for Energy Saving and Environmentally Friendly Coal-Fired Power Plants (《節約環保型燃煤發電廠標準》), Acceptance Measures for Energy Saving and Environmentally Friendly Coal-Fired Power Plants (《節約環保型燃煤發電廠驗收考核辦法》), the Measures for the Selection of Advanced Energy Saving Units (《節能先進單位評選辦法》) and the Implementation Plan for the Comprehensive Upgrading and Retrofitting and Energy Saving Replacement of Coal-fired Power Plants (《燃煤電廠綜合升級改造及節能替代實施方案》), among other policies. Our regional branches are responsible for the energy saving management.

During the construction period, each project formulates the "Overall Planning of Green Construction Project" (《綠色建造工程總體規劃》) to specify detailed plans for the quantitative control of construction water and electricity indicators, and establishes the "Implementation Plan and Rules of Green Construction Project" (《綠色建造工程實施方案與細則》) and "Measures for Green Construction, Energy Saving and Emission Reduction" (《綠色施工及節能減排措施》), and other management policies to clear specific control measures.

In terms of target management and control, the Company adopts an approach that combines goal management and process management. Firstly, we set the annual energy consumption indicators taking into account specific energy efficiency level of each grassroots power generation units and carry out assessment on the degree to which the reference target is met to help each unit achieve optimal consumption of coal, electricity, oil, natural gas. Secondly, regarding those units which have difficulty in meeting the target or unsatisfactory energy consumption outcome, the Company will arrange on-site inspection performed by professionals, who then carry out comprehensive investigations, provide recommendations and take remedial measures to ensure the fulfilment of target energy saving and emission reduction assigned by the State and the Company, and ensure that the Company's coal-fired units maintains industry leadership in energy saving.

Management Measures

In 2020, the Company continued to meet stringent key energy consumption performance targets and focused on energy conservation and energy saving measures in four areas, namely management, structure, technology and engineering. With the concerted effort of various units, the Company has maintained its industry-leading position in terms of its achieved key energy consumption performance targets by various key energy attributes.

On energy saving through management, we improved the three-level energy saving management system, optimised the three-level energy saving supervision network for grassroots enterprises and introduced energy saving benchmarks into grassroots enterprises' performance management. First, we strengthened the management of energy saving targets by following up with units that were behind the annual energy saving targets and holding dialogue with key units. Second, we enhanced the implementation and management of energy saving responsibilities by urging a breakdown of the responsibilities of all personnel in regional branches and basic-level thermal power plants by job nature for looking after energy saving-related techno-economic indicators to raise energy saving awareness. Third, we enhanced benchmark checking for power units of the same type to identify discrepancies against management, technology, safety, fuel and market benchmarks and improve energy saving management. Fourth, we initiated the selection of advanced energy saving units and benchmark power plants, promotion of the review and verification of energy saving and environmental protection excellence power plants, and a reward system for energy saving excellence and enhancement with incentive funds, and evaluation as well as encouragement of pioneering and improvement of energy consumption indicators.

On energy saving through structure, first, we organised power plants to explore their heat supply potential and tap into a wider heat supply market according to local conditions. Second, we urged regional branches to optimise their operating capacity through electricity transfers and enabled low energy consumption power units to absorb the additional power generation capacity. Third, we suggested that grassroots enterprises modulated energy saving economics to increase the output coefficient of their power units where policies allow. Fourth, we stepped up fuel procurement work and management of blended coal as fired to ensure that the heating value of coal as fired is consistent across all power plants and that the heating value of coal as fired remained at a high level for ultra-supercritical power units.

On energy saving through technology, we focused on promoting the transformation of existing power units for thermoelectric power cogeneration, facilitating the environmentally friendly and efficient utilisation of coal with a further testament to energy utilisation enhancement. In 2020, the Company's overall energy saving index and the energy consumption indexes of seven key models (e.g. 1,000 MW ultra-supercritical wet cooling, 600 MW ultra-supercritical wet cooling, 600 MW supercritical wet cooling, 600 MW supercritical air cooling, 600 MW sub-critical wet cooling, 350 MW standard wet cooling and 300 MW standard wet cooling) maintained a leading position in the industry. Seven generator units, including Yuhuan No. 4 and Shang'an No. 2, were shortlisted for the advanced units of power reliability. 63 generating units won the best performance in the national thermal power generation unit energy efficiency benchmark.

In terms of engineering construction, the Company formulated reasonable construction energy consumption indicators to improve construction energy utilisation. Based on the principle of energy conservation, each infrastructure project carefully calculated the power load and load usage time, rationally designed temporary office and living facilities in accordance with the natural conditions of the site, and selected the construction transformers with reasonable capacity and optimised the layout location of construction transformers. The power devices for construction were fully equipped with electricity meters and hierarchical management was adopted in calculating power consumption. The Company set power consumption control indicators, regularly performed calculating, accounting, and comparative analysis, and formulated preventive and corrective measures to reduce construction power consumption. The Company gave priority to the use of energy-saving, efficient, and environmentally friendly construction equipment and machinery, preferred to use energy-saving construction process, rationally reduced the time for night work through reasonable arrangement of construction procedures and progress with sharing of construction machinery, and carried out construction and commissioning in a refined manner to strive for the success of each trial operation and test with consideration of trial operation condition of power units at all stages. During the construction period of each project, the power and fuel consumption were kept under control.

During the "13th Five-Year Plan" period, the Company made steady progress with positive momentum in its production and environmental protection. In terms of equipment management, reliability was improved year by year and outperformed industry peers. In terms of energy saving and consumption reduction the energy efficiency of thermal power units remained industry-leading for many years. The Company strived for excellence of energy consumption indicators, guided and assisted backward power units, and conducted the applications of advanced energy-saving technologies such as wide-load high-efficiency power generation and generalised regeneration in a targeted manner. The leading advantage of key models was continuously consolidated.

In the future, the Company will continue to promote the transformation of existing power units for thermoelectric power cogeneration technology, implement energy-saving technical retrofits of existing power units and deepen the application of generator unit ratings to facilitate management improvement.

Integrated Energy-saving Transformation of No. 6 Power Unit of Yunhe Power Plant in Jining

The No. 6 Power Unit of Yunhe Power Plant in Jining carried out an integrated energy-saving transformation project, which included steam path retrofit for steam turbines, thermal system optimisation, technical transformation of condensate-assisted frequency and peak regulation, energy-saving transformation of vacuum system and cooling tower, efficiency improvement transformation of circulating water pumps and optimisation and adjustment test of the Unit's operation. According to the results of the performance test after the transformation, the annual average coal consumption rate for power sold of No. 6 Power Unit before the transformation was approximately 330.1 g/kWh, while the coal consumption rate for power sold after the transformation was reduced by 15.82 g/kWh to 314.28 g/kWh, which was better than the estimate of the feasibility report.

Jining Canal Power Plant

The Expanded No. 2 Power Unit of Nong'an Biomass Power Plant Was Officially Put into Commercial Operation

At 9 o'clock on 31 December 2020, the expanded No. 2 Power Unit of Nong'an Biomass Power Plant successfully passed the full-load trial operation for "72+24" hours and was officially put into commercial operation. The total installed capacity of Nong'an Biomass Power Plant reached 65,000 kW, making it the biomass power plant with the largest installed capacity in our company. The Power Plant is located in the Industrial Concentration Zone of Nong'an County, Changchun City, where there was originally a generator unit of 30,000 kW. The installed capacity of the expanded No. 2 Power Unit was 35,000 kW. Both units adopted direct biomass combustion power generation technology, using crop straw as the main fuel. After No. 2 Power Unit was put into operation, the entire plant's estimated consumption of biomass fuel increased to 60 ten thousand tons, equivalent to saving standard coal of approximately 18 ten thousand tons, reducing approximately 46 ten thousand tons of carbon dioxide emissions. In the process of project construction, the Power Plant strengthened its engineering organisation, steadily promoted its construction, achieved several major goals such as boiler ignition, steam turbine impulse starting and one-time success in grid connection. After the project was put into operation, 3,000 people were employed for the project, and it further promotes the comprehensive utilisation of local resources and clean heating achieving both environmental and economic benefits.

Nongan Biomass Power Plant

5.3.3 Water Resources Management

The Company strictly followed the government's requirements for the protection of fresh water and set out the Guiding Opinions for Thermal Power Plant's Water Saving and Waste Water Treatment (《火電廠全廠節水及廢水綜合治理指導意見》) to push forward the plant-wide water saving and waste water treatment work. The main water consumption of Huaneng International are for power units generating electricity, replenishing water for closed circulating water, and wet desulphurisation, etc. Surface water, urban water, and a small amount of groundwater, etc. are used for generating power, and river water or sea water is used for circulating. In 2020, the overall water consumption of the Company was 18,193.78 million tons, the fresh water in power generation was 382.74 million tons, the open cooling circulation water was 17,811.04 million tons, and the performance value of consumption of fresh water in power generation was 0.95 kg/kWh.

Management Objective

In 2020, Huaneng International launched the water saving and wastewater treatment work plan in its power plants in accordance with Pollution Prevention and Control Implementation Plan 2018-2020 (《污染防治攻堅實施方案(2018-2020年)》). As at the date of the report, all its subordinate power plants actively enforced the water saving and wastewater treatment measure. Upon completion of the treatment, the fresh water consumption for power generation has met the criteria set out in Standards for Energy Saving and Environmental- friendly Coal-fired Power Plant (《節約環保型燃煤發電廠標準》), with sewage discharge meeting the requirements set out in the waste discharge permits and local environmental regulations.

Management Mechanism

The Company formulated the government's requirements for the protection of fresh water and set out the Guiding Opinions for Thermal Power Plant's Water Saving and Waste Water Treatment (《火電廠全廠節水及廢水綜合治理指導意見》) to guide the plant-wide water saving and waste water treatment work.

In accordance with the Company's management systems for technical supervision, maintenance, technical transformation and energy conservation, the various thermal power plants have established a set of water consumption management systems and procedures, which include:

01 A water management system has been established and managed by specific personnel, who shall formulate rules for water usage, instruments maintenance and management. All water usage sectors and professionals conduct regular maintenance and calibration for water metering, water quality testing instruments and water-usage equipment, etc., so as to eliminate unreasonable water usage.

02 An account management system has been constructed, including the whole plant account and drainage account, water quality monitoring, water metering instrument basic information table, equipment installation location and parameter table, records of instrument test/calibration and maintenance, etc. They also regularly calculate the water management index of the whole plant, and the water usage account is based on the actual monitoring data.

03 The thermal power plants also comprehensively utilised various wastewater of the plant area and reduced discharge rate, according to the principles of shunting sewage and clean water, classification and recovery, and disposal and reuse.

Management Measures

In 2020, the Company faced no imminent threats in terms of tapping water resources. To address the water shortage risk, the Company adopted a precise management approach for water supply and consumption based on the Guiding Opinion for Thermal Power Plant's Water Saving and Waste Water Treatment (《火電廠全廠節水及廢水綜合治理指導意見》) to refine the criteria for recycle of water and classification of use of water and reduce the fresh water consumption. Currently, seawater desalination projects in Yuhuan Power Plant, Dalian Power Plant and Yingkou Power Plant of Huaneng International have been put into operation, and Weihai Power Plant's seawater desalination project is under implementation. The projects of water conservation and integrated wastewater treatment of all plants in key areas such as Beijing-Tianjin-Hebei and neighbouring "2+26" cities, Yangtze River Delta and Fen-wei Plain are advanced in an orderly manner.

During the construction period, the Company's infrastructure projects respectively determined domestic water and construction water quota indicators based on the characteristics of projects and on-site construction conditions, and conducted calculation and assessment management separately. When entering into a service contract with the construction unit, the water conservation quota indicators were included in the contract terms for calculation and assessment. In the design stage, the supply and drainage systems of the office and living areas at the construction site shall be reasonably arranged, and a water-saving system shall be applied for domestic water with obvious water-saving marks set at the water source location. In addition, on-site construction organisation shall be strengthened for each project, and the on-site water supply pipe network shall be simple, reasonable, and leak-free through design analysis and rational arrangement at the construction site; a reusable water collection and treatment system shall be established at the construction site to make water resources available for cascade recycling; rainwater collection tanks shall be set up to recover rainwater, which will be used for road spraying, vehicle washing and greening after treatment; domestic sewage treatment stations shall be designed, constructed and put into use in advance, and all the domestic sewage in the construction area will be treated by the sewage treatment stations, the treated water shall be reused for vegetation greening, road spraying, etc. The Company's water resource consumption during the construction of various projects shall be kept within the scope of management objectives.

5.3.4 Emissions Management

The Company abides by laws and regulations such as the Environmental Protection Law of the People's Republic of China (《中華人民共和國環境保護法》), the Law of the People's Republic of China on the Prevention and Control of Solid Waste Pollution (《中華人民共和國固體廢棄物污染環境防治法》), the Law of the People's Republic of China on Prevention and Control of Air Pollution (《中華人民共和國大氣污染防治法》) and the Law of the People's Republic of China on Noise Prevention and Control (《中華人民共和國環境噪聲污染防治法》), and in accordance with the national policies on environmental protection and policy documents such as regarding ecological environment of "13th Five-Year Plan" and energy conservation and emission reduction and the requirements of relevant authorities, the Company has put forward the plan to become a first-class enterprise for environmental protection based on the aim to build a world-class listed power generation company and in consideration of its actual situation. According to Pollution Prevention and Control Implementation Plan 2018-2020 (《污染防治攻堅實施方案(2018-2020年)》), the ultra-low emission transformation and comprehensive utilisation of solid waste are fully deployed. The Company attaches great importance to the discharge management of pollutants, all thermal power units are required to install desulphurisation, denitration and dust removal devices and wastewater treatment and other environmental protection facilities, strengthen the operation, maintenance and repairment of environmental protection facilities, strictly abide by the requirements of sewage permits, and the discharge of pollutants meets national standards and territorial requirements.

During the construction period, the construction unit and each participating unit established a green construction management system, formulated management systems such as the Overall Planning of Green Construction Project, the Implementation Plan and Detailed Rules of Green Construction Project and the Measures for Green Construction and Energy Saving and Emission Reduction, which were independently defined in the general design of the engineering construction organisation with detailed regulations on green construction and environmental protection. The quantitative control targets for controlling emissions during the green construction process were clarified with specific pollution control measures. The Company's construction projects strictly implemented the requirements of "Three Simultaneities" (Simultaneous design, simultaneous construction, simultaneous use) for environmental protection, and in accordance with various environmental protection work and environmental protection measures recommended by the environmental impact assessment approval. In addition, we strengthened the stable operation of environmental protection facilities, ensured the emission of pollutants met the standards, and entrusted an environmental protection supervisor to supervise, inspect and guide the implementation.

5.3.4.1 Exhaust Gas Management

The exhaust gas discharged by Huaneng International is mainly carbon dioxide, sulphur dioxide, nitrogen oxides and soot generated from its subordinate power plants during the process of combustion in the coal-fired utility boiler. The Company's emissions of sulphur dioxide, nitrogen oxides and soot were 25,990.39 tons, 50,875.08 tons and 3,264.55 tons respectively, with emission performance values of 0.07 g/kWh, 0.13 g/kWh and 0.01 g/kWh respectively.

Management Mechanism

The Company formulated the Regulations on Environmental Protection Management (《環境保護管理規定》), Measures for Evaluation and Accountability for Environmental Protection Work (《環境保護工作考核及責任追究辦法》), Operation Management Rules (《運行管理規定》), Overhaul Management Rules (《檢修管理辦法》), Technical Supervision Management Measures (《技術監督管理辦法》) and Management Measures for Capital Expenditure in Electricity Generation (《電力生產資本性支出項目管理辦法》) to ensure the progress on the work related to ecological environment protection and air pollution prevention and control projects.

The Company made full use of its internal information platform to grasp the situation of excessive emission, focused on the analysis of events with long duration, seriously excessive emissions and typical causes, and guided subsidiaries to learn from one another and take active measures to improve the Company's overall environmental protection management capability. In addition, giving consideration to the promotion of annual key tasks, major projects, air quality assurance tasks, etc., the Company launched environmental protection inspections irregularly to ensure active and effective rectification of related issues.

Management Measures

To enhance waste gas management, the Company has taken the following measures:

01 **Enhance the supervision and implementation of work tasks.** Enhance the review management of environmental protection renovation projects, optimise review procedures, secure renovation investment, strengthen supervision and management of key process such as bidding process and inspect and supervise key work tasks to carry forward the pollution prevention and control tasks.

02 **Ensure effective cleaning.** Continuously maintain the safe and reliable operation of environmental protection facilities, strengthen real-time monitoring of pollutants discharge, ensure discharge compliance, and effectively control pollutant discharge in accordance with requirements set out in the pollutant discharge permit to secure a leading position in terms of pollutant discharge in the industry.

03 **Successfully complete the air quality assurance and pollution control tasks.** Ensure good air quality during key hours and weathers with serious pollution, ensure effective pollution prevention and control in key regions such as Beijing-Tianjin-Hebei and neighbouring region, Yangtze River Delta and Fen-wei Plain, and fully adopt measures such as load reduction of diesel trucks, non-peak-hour transportation and control of fugitive emissions.

04 **Continuously innovate environmental protection technology.** Successfully demonstrate the desulphurisation wastewater bypass exhaust evaporation technology in Huangtai Power Plant and launch the R&D on the digital circulating water waste discharge reduction technology in Mianchi Power Plant to provide experience for the subsequent projects and promote the innovation of environmental protection technology.

05 **In accordance with the "Four Conservations and Environmental Protection" (energy conservation, land conservation, water conservation, material conservation and environmental protection) standard, the Company makes specific optimisation of the corresponding requirements of green construction in the design process.** Emission of hazardous gases from machinery and equipment and vehicles entering and leaving the site shall meet the requirements of national annual inspection, and the emission of welding fume shall comply with the Integrated Emission Standard of Air Pollutants (《大氣污染物綜合排放標準》). The project environment shall be assessed and a report shall be issued on a monthly basis. A continuous emission monitoring system (CEMS) was installed at the site to monitor the soot of flue gas pollutants, sulfur dioxide (SO_2) and nitrogen oxides (NO_X) in real time. During the construction period, there was no excessive emission of hazardous gases during the construction of each infrastructure project.

Work Achievements

In 2020, Huaneng International's ultra-low emission unit capacity reached 98%. The emission of three major pollutants, namely sulphur dioxide, nitrogen oxides and soot, remained at the same level compared with the same period last year, indicating a stable ultra-low emission level, which conforms or precedes the national emission standard. The Company's environmental index maintains to outperform industry peers.

Denitration System of Jinggangshan Power Plant

With the increasing requirements of environmental protection, the emission of nitrogen oxides (NOx) from the chimney was controlled below 50 mg/m³ according to the ultra-low emission standard. The original design and operation of the denitration system for No. 3 and No. 4 power units of Jinggangshan Power Plant could not meet the current environmental protection requirements of production. Therefore, the power plant has carried out related transformation of denitration equipment and further optimised its operation, and made corresponding adjustments to blend coal-fired to effectively reduce the problems caused by denitration.

Jinggangshan Power Plant

Future Plan

First, the Company will continue to drive its pollution prevention and control efforts, focus on environmental protection transformation projects in key regions, including close-down of coal field and ash field treatment for power plants, while expediting pollution prevention and control projects such as ultra-low emission renovation for units.

Second, the Company will continuously promote clean production practices, enhance permit-based waste discharge management, ensure effective management and control for air quality in key hours and weathers with serious pollution, strengthen the inspection management for environmental protection supervision at different level and improve the prevention and response for public opinion risk related to environmental protection.

Third, the Company will maintain a vigorous environmental protection supervision and management, strictly comply with the requirements set out in the Environmental Protection and Pollution Control Accountability Measures (《生態環境保護及污染防治攻堅工作責任追究辦法》), strengthen supervision and site inspection to ensure effective supervision and management of the implementation of air pollution prevention and control tasks.

Fourth, the Company will establish a sound environmental protection standard system, promote the research and development and application of technologies such as integrative removal of pollutants and comprehensive energy saving and environmental protection transformation, and summarise experiences from demonstrative projects to provide guidance to other projects.

5.3.4.2 Management of Greenhouse Gases

In 2020, China made a solemn commitment to reaching “peak carbon dioxide emissions” by 2030 and achieving “carbon neutrality” by 2060. The Company plans to accelerate increase in clean energy during the “14th Five-Year Plan” period, strengthen the transformation and operation of environmental protection equipment of coal-fired units, and achieve “peak carbon dioxide emissions” by the end of the “14th Five-Year Plan”. The Company will also closely follow relevant national policies regarding carbon emission and trade, actively participate in the implementation of the policies and play our role in “peak carbon dioxide emissions” and achieving “carbon neutrality”.

The Company has actively carried out management work related to greenhouse gas, and successively issued regulations and systems such as the Carbon Asset Management Measures, the Regulations on Statistics and Management of Greenhouse Gas Emission, the Regulations on Development and Management of Voluntary Emission Reduction Projects and the Regulations on Quota Compliance and Transaction Management, which, respectively, have provided detailed guidance and regulations for carbon asset management, greenhouse gas statistics management, development of voluntary emission reduction projects and carbon asset transaction. In terms of reducing carbon emissions, the Company currently embarks on its work in the two following aspects: 1) focusing on energy saving and consumption reduction through management, structural and technical adjustment, and reducing coal consumption rate for power units to decrease the carbon emission intensity; 2) improving the proportion of the installed power capacity using clean energy through adjustment of energy structure.

In 2020, the Company's project of "improvement and verification of key technology for carbon dioxide capture and utilisation" was set up with a carbon dioxide capture device of 1,000 tons per year built in Yangpu thermoelectric, to raise the Company's overall capability in carbon dioxide capture and utilisation of technology and help achieve the objectives of "peaking carbon dioxide emissions" and "carbon neutrality".

Carbon dioxide is the major greenhouse gas produced during the operation of the Company. It is mainly produced in the combustion process of coal, and a small amount is produced in the wet limestone-gypsum desulphurisation process. In 2020, the Company's total energy-related direct greenhouse gas emissions amounted to 33,328.88 ten thousand tons of carbon dioxide equivalent, of which the total amounts of coal, natural gas and fuel consumption were 32,107.79 ten thousand tons of carbon dioxide equivalent, 1,024.91 ten thousand tons of carbon dioxide equivalent, 9.53 ten thousand tons of carbon dioxide equivalent respectively and the total volume of greenhouse gas emissions generated by desulphurisation was 186.65 ten thousand tons of carbon dioxide equivalent. This transforms into a direct greenhouse gas emission intensity of 726.09 grams of carbon dioxide equivalent/kWh. The Company's energy related indirect greenhouse gas emissions amounted to 11.37 ten thousand tons of carbon dioxide equivalent, which translates into an indirect greenhouse gas emission intensity of 0.25 grams of carbon dioxide equivalent/kWh.

Carbon Asset Management

In terms of carbon asset management, the Company has entrusted Huaneng Carbon Asset Management Co., Ltd. (the "Carbon Asset Management") to formulate trading strategies, provide agency transaction and escalate compliance issues to higher authorities. After communicating with regional branches and grassroots enterprises and taking into consideration the actual circumstances and market trends, the Carbon Asset Management conducts carbon asset transaction and contracts performance reporting. According to national and local governments' carbon emission requirements, regional branches are mainly responsible for the implementation of carbon asset transaction and contract performance, greenhouse gas reporting and budget declaration. Under the leadership of regional branches, project units and enterprises have set up special organisations and designated special personnel to be responsible for the work such as carbon emission transactions, development of voluntary emission reduction projects, data monitoring and reporting, etc.

Performance in Carbon Trade Pilot Regions

Regarding carbon asset transaction and contract performance, the Company's grassroots units in pilot zones such as Beijing, Chongqing, Fujian, Guangdong, Hubei, Shanghai and Tianjin appointed Carbon Asset Management to conduct carbon audits and carbon emissions transactions. Most of the pilot zones successfully met the annual carbon transaction and contract performance targets in accordance with the pilot requirements of lead local agencies.

Participation in National Carbon Emission Trade Market

Continuously improve centralised and professional management of carbon asset. The Company has established a three-level carbon emission management system to specify the bodies and personnel responsible for carbon asset management, and has formed a mechanism for work handover among the various levels of management staff to establish the division of labour and implementation responsibility. All grassroots enterprises of the Company have appointed Carbon Asset Management to provide one-on-one training and assist them in completing carbon audits and carbon transactions.

Actively participate in the policy study for the national carbon trade market. The Company actively participated in the policy study and discussions related to management rules and quota allocation plan for the national carbon trade market organised by the Ministry of Ecological Environment and China Electricity Council. It also closely monitored the policy development related to the construction of the national carbon trade market, carbon trade in pilot regions and voluntary emission reduction development and offset rules so as to keep ahead of the latest trend and mitigate the impact from the launch of the national carbon trade market.

Actively participate in the construction of the national carbon trade market and performance of carbon trade in pilot regions. The Company participated in and provided trainings related to the national carbon trade market, organised subordinate companies to perform trials on allocation of carbon emission quota, completed carbon trades in the pilot regions as required, conducted online monitoring and research of carbon dioxide flue gas and fulfilled the milestones in building the national carbon trade market.

Actively make preparations. We also closely followed up the construction process of national carbon emission trade market, and made technical preparations.

Research and Development of Carbon Dioxide Capture Technology

The first phase-change carbon dioxide capture industrial device of 1,000 tons per year in China, independently developed by Huaneng Group Clean Energy Technology Research Institute Co., Ltd. ("Huaneng Clean Energy Research Institute"), successfully achieved continuous and stable operation for 72 hours at Changchun Thermal Power Plant. This technology can effectively solve the problem of high energy consumption of traditional capture methods and the main technical indicators are recognised by experts as internationally leading. The successful operation of the device is not only of great reference significance for the subsequent development and engineering scale-up of phase-change capture technology in China, but also provides new technical support for power plants to effectively cope with climate change, and achieve carbon dioxide emission reduction and the vision of "carbon neutrality".

The carbon dioxide capture rate in the flue gas can reach 90% through this technology, while the amount of regeneration solution decreases by 40%-50%, and the regeneration heat consumption is less than 2.3 GJ/ton of carbon dioxide, which is more than 45% lower than the traditional ethanolamine absorption method, bringing significant social and economic benefits.

Changchun Thermal Power Plant

Future Plan

The Company will closely monitor the development of the national carbon trade market system, including the quota allocation plan, continuously improve the carbon asset management system and mechanism, strengthen routine management of carbon emission data, prepare budget for carbon asset management and trade, ensure effective implementation of carbon asset management works, estimate the carbon emission limit threshold and prepare for trade system test and actively participate in preparations of the national carbon trade market.

5.3.4.3 Wastewater Management

The Company generates a certain amount of wastewater in the process of electricity production, including those from the concentration of steam turbine circulating cooling water, the wet desulphurisation facilities, the auxiliary production facilities of the generator set, the coal field flush as well as sanitary sewage.

In 2020, the total water discharge of the Company amounted to 17,282.60 million tons, the discharge of open cooling circulation water totalled 17,250.62 million tons, and the total discharge of sewage (including industrial and desulphurisation wastewater) was 31.98 million tons. Some of these waste water were allowed to be discharged when they reached a certain standard after treatment, e.g. waste water from circulating water; some were reused after treatment and cannot be discharged, e.g. those from desulphurisation facilities and coal field flush; and certain power plants did not allow any waste water to be discharged to achieve zero discharge. At present, the Company is actively promoting the implementation of wastewater treatment and transformation projects, especially for power plants in key areas and along the Yangtze River to meet environmental protection requirements.

The Company adopted the following measures in the management of wastewater treatment and discharge:

01 The Company rigorously implemented the applicable water pollution policies and sewage discharge licensing requirements. All thermal power plants of the Company obtained the corresponding sewage discharge licenses as scheduled.

02 Inspection and rectification were carried out against the sewage discharge licensing requirements. A company level comprehensive pollution prevention and control plan was formulated based on environmental protection requirements at various levels, and power plant water saving and wastewater treatment transformation projects were launched in an orderly manner in accordance with the requirements of local governments and environmental assessment.

03 The Company also performed on-site checks and inspections of environmental protection facilities, including wastewater treatment units.

04 The Company continuously improved its environmental protection system by formulating the Guiding Opinions on Water Saving and Wastewater Discharge Transformation to ensure the compliance with environmental protection requirements through research and optimisation.

05 The Company actively adopted the latest wastewater treatment technology and launched wastewater transformation demonstrative projects.

Future Plan

The Company will continue to strengthen water pollution control and promote the enhanced treatment and comprehensive utilisation of industrial wastewater and domestic sewage, as well as launch wastewater zero discharge transformation projects in an orderly manner in areas where specific environmental protection requirements apply.

With the gradual deepening of wastewater treatment work as well as the increased wastewater treatment technology research efforts by domestic tertiary institute, Xi'an Thermal Power Research Institute Co., Ltd. ("Xi'an Thermal") and Huaneng Clean Energy Research Institute, we will formulate a roadmap for developing practical, reliable and cost-effective wastewater treatment technology. We will gradually carry out thermal power plant water saving and wastewater comprehensive treatment transformation in key areas in order to eventually enable all thermal power plants to comply with the updated pollutant discharge licensing requirements, with some reaching even higher standards.

5.3.4.4 Waste Management

The Company's disposal of wastes strictly complies with laws and regulations such as the Law of the People's Republic of China on Prevention and Control of Solid Waste Pollution (《中華人民共和國固體廢棄物污染環境防治法》) as well as the Company's regulations including the Regulations on Environmental Protection Management, the Measures for Evaluation and Accountability for Environmental Protection Work, the Management Standards for Solid Waste, the Governance and Management Standards for Desulphurisation By-products, the Governance and Management Standards for Fly Ash, etc. The Company requires that the storage, discharge, and disposal of waste comply with national laws and local policies. It also cooperates with qualified third parties to deal with waste and strengthens waste recycling to minimise waste emissions.

Non-hazardous Waste

Huaneng International's production activities are mainly concentrated in the area of power production and the main solid waste generated during the Company's power generation process includes fly ash and cinder produced during the combustion process of the boiler, and gypsum produced during the limestone wet desulphurisation in power plants. The Company produced 4,133.50 ten thousand tons of solid waste, among them, 3,274.18 ten thousand tons of fly ash and cinder, and 859.32 ten thousand tons of desulphurised gypsum during the year of 2020. The comprehensive utilisation rate of fly ash and cinder stood was 89.08% and the desulphurisation gypsum disposal utilisation rate was 87.55%.

Fly ash and cinder, desulphurisation gypsum and other solid waste can be sold as raw materials in related industries, such as cement, concrete, aerated blocks and gypsum board. The Company has established an environmental protection supervision and management system in accordance with national and local environmental protection standards and policy requirements to effectively control the canning, stacking and marketing of cinder and desulphurisation gypsum.

When loading cinder and gypsum, the Company rigorously follows the operational norm for load control, separates the cinder and gypsum and controls the load capacity during transportation and conducts thorough check and cleaning before vehicle entry to prevent "escape, spill over, dripping and leakage" of solid wastes. Most of the cinder and gypsum collected from boilers will be directly transported to the processing plants for secondary use. The Company closely monitors where the by-products of power generation are being transported and how they are going to be used to prevent environmental pollution and public issues that have a negative impact on society.

The power plants will temporarily place some fly ash and cinder on ash storage sites and the Company has implemented a rigorous control system to ensure the safety of ash dams and prevent seepage by carrying out regular assessment and inspection. In accordance with the requirements of local environmental protection authorities, construction and retrofitting of wind-proof and dust control facilities have been carried out to ensure that the storage of ash and gypsum is in line with local environmental protection standards.

In the construction project, the generation of waste is effectively reduced at the project site through relevant measures such as permanent and temporary combination of roads and office locations. The project waste is collected by classification, stored in a centralised way and cleaned up regularly, and corresponding units are entrusted to clear and transport it regularly. The gravel and earthwork construction waste from the project is used as the on-site roadbed backfill material to realise harmless treatment.

Yueyang Power Plant to Build a "Terminator" of Urban Pollutants

Bearing in mind President Xi Jinping's advice to "protect a river of clear water" during his visit to Yueyang section of the Yangtze River, Yueyang Power Plant has actively seized the opportunities of energy revolution and supply-side structural reform, and developed the first mature pre-drying carbonization technology of various municipal wastes with independent intellectual property rights at home and abroad. The technology makes full use of the characteristics of large capacity and high temperature of existing power plant boilers and perfect environmental protection treatment equipment. The municipal sludge, household garbage and other wastes are treated by the integrated treatment device, and then incinerated and purified by the boiler at high temperature for comprehensive utilisation, so as to achieve the recycling, reduction and harmless disposal of municipal wastes.

Yueyang Power Plant Municipal Waste Pre-drying Carbonization Technology Demonstration Platform

At present, the model of Yueyang Power Plant construction's processing capacity of 100 tons per day sludge drying coking processing project has been put into commercial operation. During the 14th Five-Year Plan period, Yueyang Power Plant plans to use the existing site to expand 3 to 5 sets of integrated dry carbonisation treatment plants with a processing capacity of 200-500 tons per day. By the end of the 14th Five-Year Plan period, Yueyang Power Plant will have a disposal capacity of 60 ten thousand tons per year, and actively strive to obtain the right to dispose of urban wastes around Dongting Lake, so as to build a "terminator" of urban pollutants.

The First Sludge-coupled Power Generation Project in Southwest China Was Officially Put into Operation at Luohuang Power Plant

On 25 June 2020, Phase I of the first sludge-coupled power generation project in southwest China was officially put into operation at Luohuang Power Plant. The project is a national-level pilot project for technical transformation where the annual disposal amount of domestic sludge accounts for nearly one-third of the total amount of domestic sludge in Chongqing. Urban domestic sludge is put into boilers for combustion and power generation after thermal drying and pulverising, and the odour, waste water and other pollutants generated during the process are subject to whole-closed and harmless treatment, so as to achieve no pollution leakage in the whole process. The Phase I of the project that has been put into operation can dispose of nearly 20 ten thousand tons of domestic sludge annually with an increase of biomass power generation by 49 million kWh and an increase of external heat supply by 17.4 ten thousand tons, which brings comprehensive benefits of more than RMB10 million to the power plant. Meanwhile, the project has achieved remarkable results in energy saving and consumption reduction, which can save 1.48 ten thousand tons of standard coal and reduce 4.14 ten thousand tons of carbon dioxide emissions each year.

Sludge-coupled Power Generation Project

The sludge-coupled power generation project is an important practice of the Company in fulfilling its social responsibility. With utilisation of mature incineration power generation technology and ultra-low pollutant emission technology of thermal power plants, urban domestic sludge is disposed of in adherence to the principles of "harmlessness, reduction, recycling and large scale", which can provide strong support to the stable operation of urban sewage treatment plants, as well as contributing to Chongqing's fight against pollution control and protection of the Yangtze River.

Hazardous Waste

The main hazardous waste produced by the Company during the process of power generation includes such hazardous solid waste as used denitration catalysts and ion exchange resin deactivated in wastewater treatment, as well as hazardous liquid waste like waste oil produced during the operation of power plant units. The Company regenerates the denitration catalysts which have reached their life limit and continues to charge them into denitration devices for use. Inactivated ion-exchange resin from chemical water treatment can be restored to its original state for reuse after being rinsed with mineral acids or alkalis of a certain concentration. The Company will, based on laws and regulations and the

Company's requirements, hire qualified agencies to deal with denitration catalysts that could not be renewable anymore, ion exchange resins that cannot be reused and hazardous waste such as lubricant and other waste oil during operations. Besides, through managing the accounts, we detailed statistics on the amount of waste generated, the amount of disposal, and the audit of the qualifications of disposal units, etc., and strictly managed the generation and disposal of waste. In 2020, the Company, in the process of production and operation, generated 7,899.14 tons of denitration catalysts, 201.09 tons of ion exchange resin and other hazardous solid waste and 784.59 tons of waste oil and other hazardous liquid waste.

Future Plan

The Company will continue to strengthen waste recycling and strive to minimise waste emissions. In addition, the Company will well implement environmental protection transformation projects in key regions, including close-down of coal field and treatment of ash field for power plants.

5.3.5 Other Environmental Impacts

Huaneng International always handles its operations with great care to minimise their impact on the environment, and performs strict management of noise, dust and the environment of engineering projects in accordance with the Law of the People's Republic of China on Noise Prevention and Control (《中華人民共和國環境噪聲污染防治法》).

Noise Management

From the initial stage of the construction of power plants subordinated to the Company, relevant departments of environmental protection determined the sensitive points of noise within the boundaries of power plants and relevant noise control level, in accordance with environmental impact assessment approval requirements. Each construction site formulated noise reduction measures in strict accordance with the requirements of the state's Standards for Environmental Noise Emission at the Construction Sites (《建築施工場界環境噪聲排放標準》), and performed regular inspection and recording of noise at the construction sites. Noise control during the construction period was mainly to control the noise source. Low-noise construction machinery and transportation vehicles were used for each project, and the repair, maintenance and management of equipment, construction machinery and transportation vehicles were strengthened to avoid noise generated by abnormal operations. Noise reduction and sound insulation measures have been adopted for strong noise sources such as noise from construction machinery and equipment, pipe flushing, sandblasting, and spraying construction. The strong noise equipment at the construction site was installed on the side far away from the residential area. Noise reduction measures such as closing or setting up noise reduction walls are adopted for strong noise equipment and steam pipe blowing was notified of in advance. The noise control during the construction of each project met the requirements of national standards. In the environmental completion acceptance of the power units in all power plants, the monitoring authorities will monitor according to the environmental impact assessment approval requirements, and only when the monitoring results are qualified will the acceptance concerning noise control pass. During the operation of power units, the power plants entrusted relevant monitoring authorities to regularly monitor the noise control regularly in accordance with requirements of environmental protection authorities and published the monitoring reports in different ways. The power plants installed noise coverings on equipment such as fans which are the noise sources in the plant area and built noise walls in key areas such as the cooling water tower area. When the power units are undergoing transformation or equipment failure which causes excessive noise, the Company will conduct noise reduction transformations accordingly.

Dust Impact

Other environmental impact generated by power plants also includes coal field dust, ash field dust and unorganised emissions from non-road machinery. All power plants owned by the Company during their initial stage of construction are all required to pass the environmental impact assessment approval by the relevant environmental protection departments, in order to avoid serious impact on the surrounding environment and natural resources during operations. During operations, the power plants strictly abide by national environmental emission standards, and discharge wastes within the standards. Some of the power plants actively responded when the requirements of surrounding environment changed, to ensure that the surrounding environment and natural resources are protected. To enhance the management of unorganised emissions from coal yards, the Company has carried out coal field closure retrofits in key areas and introduced wind and dust suppression nets, covers and sprays to effectively control coal and dust pollution from coal fields and improve their surrounding environments. In terms of engineering construction, all participating units have carried out construction in strict accordance with the green construction plan and organisational measures, and suppressed the generation of dust by taking measures such as regular spraying and construction road hardening.

Environmental Impact of Engineering Projects

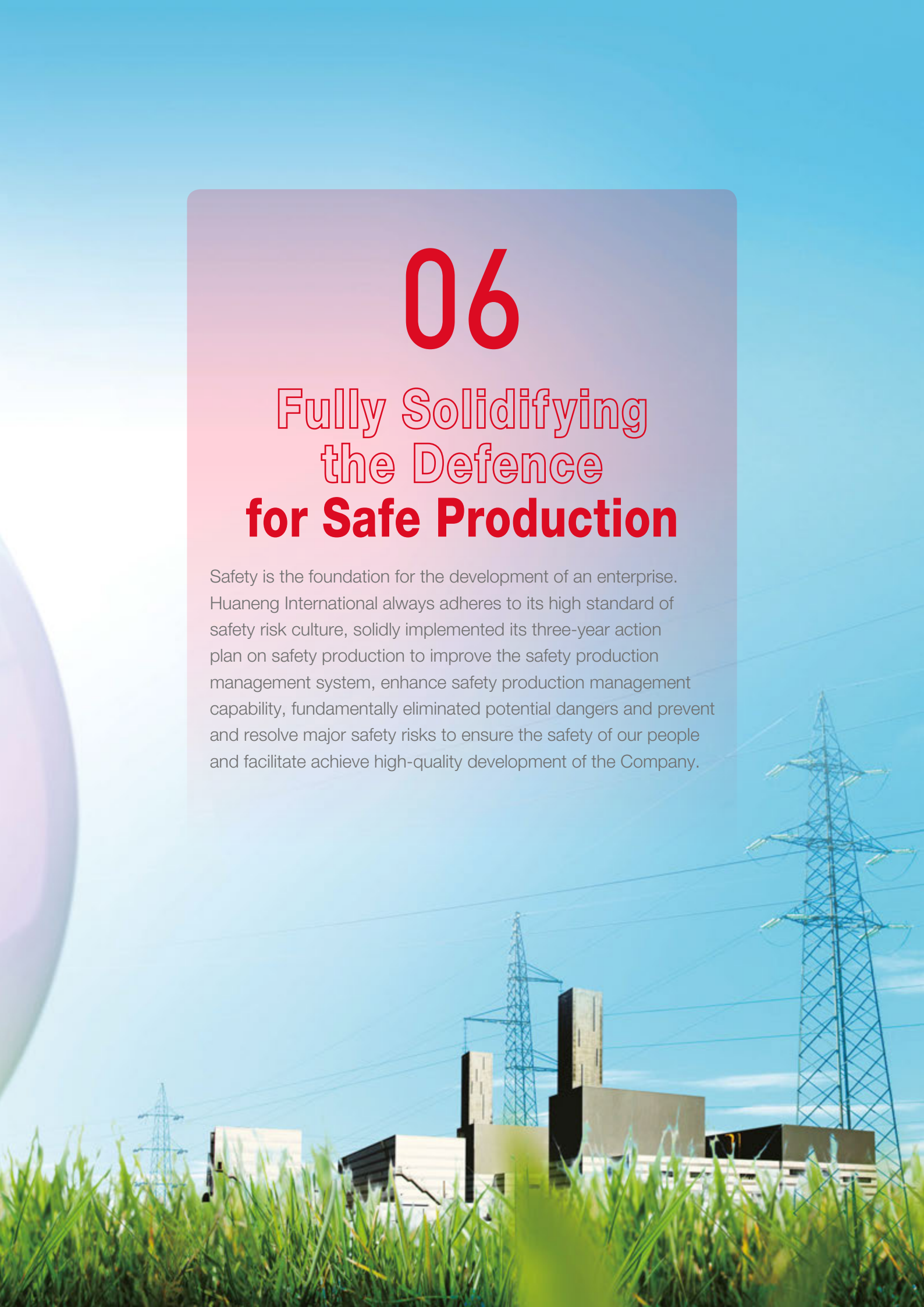
The environmental impact of the Company's projects is fully considered in the process of feasibility study before the projects enter the approval stage. In terms of land location, the Company, with strict reference to government land planning, avoids ecological red line areas, agricultural land, etc., so as to prevent the resultant ecological problems. After the location is determined, the Company conducts a systematic survey of the environment of the project's location at the feasibility study stage, and prepares a detailed environmental management and monitoring plan based on actual condition and relevant regulations. Before the construction begins, the Company fully considers the environmental protection measures of the project during stage of construction and operation, and ensures that the environment will be restored through land reclamation, vegetation restoration and other measures after the completion of the construction, and rigorous monitoring and treatment of pollutants, electromagnetism, noise, etc., are carried out based on the requirements of relevant laws and regulations on environmental protection. When economic benefits permit, we strive to integrate power generation projects with environmental protection, promote the preliminary investigation and implementation of ecological projects, and make positive contributions to local environmental governance and improvement.


反渗透浓水

06

Fully Solidifying the Defence for Safe Production

Safety is the foundation for the development of an enterprise. Huaneng International always adheres to its high standard of safety risk culture, solidly implemented its three-year action plan on safety production to improve the safety production management system, enhance safety production management capability, fundamentally eliminated potential dangers and prevent and resolve major safety risks to ensure the safety of our people and facilitate achieve high-quality development of the Company.



In accordance with the Production Safety Law of the People's Republic of China (《中華人民共和國安全生產法》) and other production safety laws and regulations, Huaneng International regards safety as its top priority, builds a solid foundation for safe production, pays attention to the inspection and remedial of safety hazards, has a zero-tolerance policy for safety incidents, permanently adheres to the production safety principles of "people-oriented, safety first, prevention first, comprehensive management", upholds the safety conception of "safety is credibility, efficiency, competitiveness; responsibility of safety is of the greatest significance". The Company aims to prevent personal death, mishandling of operations with malicious intent, major equipment damage, major equipment incidents, fire outbreaks, traffic accidents for which someone is held responsible, environment pollution and other incidents that may adversely affect the Company's reputation. The Company places safety in the first place and attaches great importance to the personal safety and occupational health of employees. We strengthened the red line awareness and effectively implemented safe production.

According to the Company's Safety Production goal within the "13th Five-Year Plan" period, by 2020, the Company and the units regulates the operation of the intrinsic safety system, incorporates outsourcing into the scope of the Company's management and further enhances training on production safety for comprehensive control of on-site risk management, effective implementation of the accountability system and prevention of safety accidents and occupational diseases. The target is to achieve zero injuries (minor or more severe injuries), zero (environmental) pollution, and zero (equipment) incident in the grassroots business unit. Major production safety tasks during the "13th Five-Year Plan" period include strengthening outsourcing management, deepening the operation of the intrinsic safety system, deepening risk control, deepening potential safety hazards management, strengthening emergency response management, advancing production safety education, strengthening on-site monitoring, promoting the development of safety management IT system and creating a corporate safety culture.

In 2020, there had been no significant violation identified in the Company related to providing a safe working environment and protecting the employees from occupational hazards.

6.1 Consolidating the Intrinsic Safety

According to laws and regulations on production safety stipulated by the state, the Company, taking into consideration actualities of its subsidiaries, has established its own fourfold Intrinsic Safety System ("ISS"), which comprises intrinsic safety of personnel, process equipment, environment and management. Four aspects of the ISS include:

Ensuring Intrinsic Safety of Personnel

Intrinsic Safety of personnel includes management staff and all employees' safety awareness, safety conception and safety management knowledge and skills. Management staff were required to have safety management knowledge and skills and lead by example, while employees were required to ensure safe operation by carrying out adequate controls. We urged employees to take proactive steps and act in accordance with rules and regulations.

Ensuring Intrinsic Safety of Equipment

Intrinsic safety of equipment refers to the fact that equipment, facilities, or process technologies contain inherent functions that prevent accidents from an occurrence. We adhered to high design and manufacturing standards and conducted a systemic safety risk analysis of process, equipment, inspection and maintenance. We also put forward and implemented risk control measures to ensure the safe, stable and regular operation of equipment and systems within the prescribed operating and maintain effective control.

Ensuring Intrinsic Safety of Environment

Environment includes space environment, physical and chemical environment, the natural environment, etc. Environment safety thus means meeting all kinds of requirements. For the intrinsic safety of the spatial environment, we made sure that the production space, layout, various safety and sanitation facilities and passages complied with the state's relevant regulations and national standards. For the intrinsic safety of the physical and chemical environment, effective measures were taken to manage and control lighting, ventilation, temperature and humidity, noise, dust and toxic and harmful substances in compliance with national standards to ensure workers' health and safety. As for the intrinsic safety of the natural environment, we enhanced the disaster resistance and prevention capabilities of process and equipment and implemented emergency response and precautionary measures.

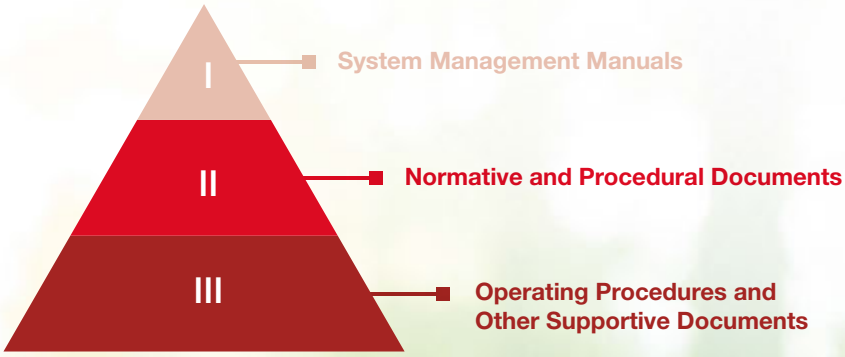
Ensuring Intrinsic Safety of Management

Intrinsic safety of management requires, under the condition of fulfilling national laws and regulations, companies' formulation and implementation of higher standards on safety, norms, and regulations, as well as their development of a comprehensive management system. In respect of safety management, we were transitioning from post-incident-based to identification-based in addressing safety issues, and we are placing more emphasis on process controls rather than remedial efforts in responding to safety incidents. We also sought to apply safety system engineering principles and conduct scientific analysis in formulating pre-emptive measures.

The PDCA Management Model of Intrinsic Safety System

The Company's intrinsic safety system follows the PDCA management model, i.e. PLAN, DO, CHECK and ACTION, establishing circulation and improves continuously. The management model consists of six key elements: leaders' commitments, safety policies, health and environment, planning, implementation and operation, inspection and corrective measure, and management review.

The Company's Intrinsic Safety System's (ISS) documents consist of system management manuals, standards and procedural documents, as well as operating procedures and other supportive documents, mainly including the Administrative Measures for Production Safety Supervision (《安全生產監督工作管理辦法》), the Regulations on Production Safety (《安全生產工作規定》), the Implementation Rules for Safety Performance Assessment (《安全績效考核實施細則》), and the Emergency Management Measures for Major Incidents (Accidents) (《重大突發事件(事故)應急管理辦法》), etc.



In 2020, the Company continued to develop its ISS:

01 The Company was fully prepared for epidemic prevention and control under the standard production safety work, through issuing the Highlights on the Priorities for Safety Management During the Epidemic Prevention and Control (《疫情防控期間安全管理重點工作提示》), the Safety Production Priorities in 2020 (《2020年安全工作要點》), and the Selected Production Safety Accident Cases (《生產安全事故案例選編》), to guide grassroots units in developing resumption plans, delivering risk alert or warning education on accident cases and strictly practising epidemic prevention and control and safety production.

02 In order to enhance risk control and prevent safety risks, the Company issued and implement the Guidance on Classified Control and Management of Safety Production Risk (《安全生產風險分級管控導則》), comprehensively promoted the construction of the "dual" prevention mechanism of graded risk control and hidden danger detection and management and implement the essential safety management system for infrastructure construction. In addition, the Company developed a constraint system for contractors and introduced detailed rules to launch a "blacklist" to manage contractors. Meanwhile, the Company conducted special inspections on hazardous chemicals, network-related safety, restricted space, and power supply during special event periods.

03 The Company strengthened emergency management and scientific innovation, explored the construction of scenario-based emergencies and carried out more emergency exercises to enhance its emergency response capability. Besides, the Company promoted its achievements in safety technologies, of which 22 projects were recommended for the National Award for Safety Technology Progress.

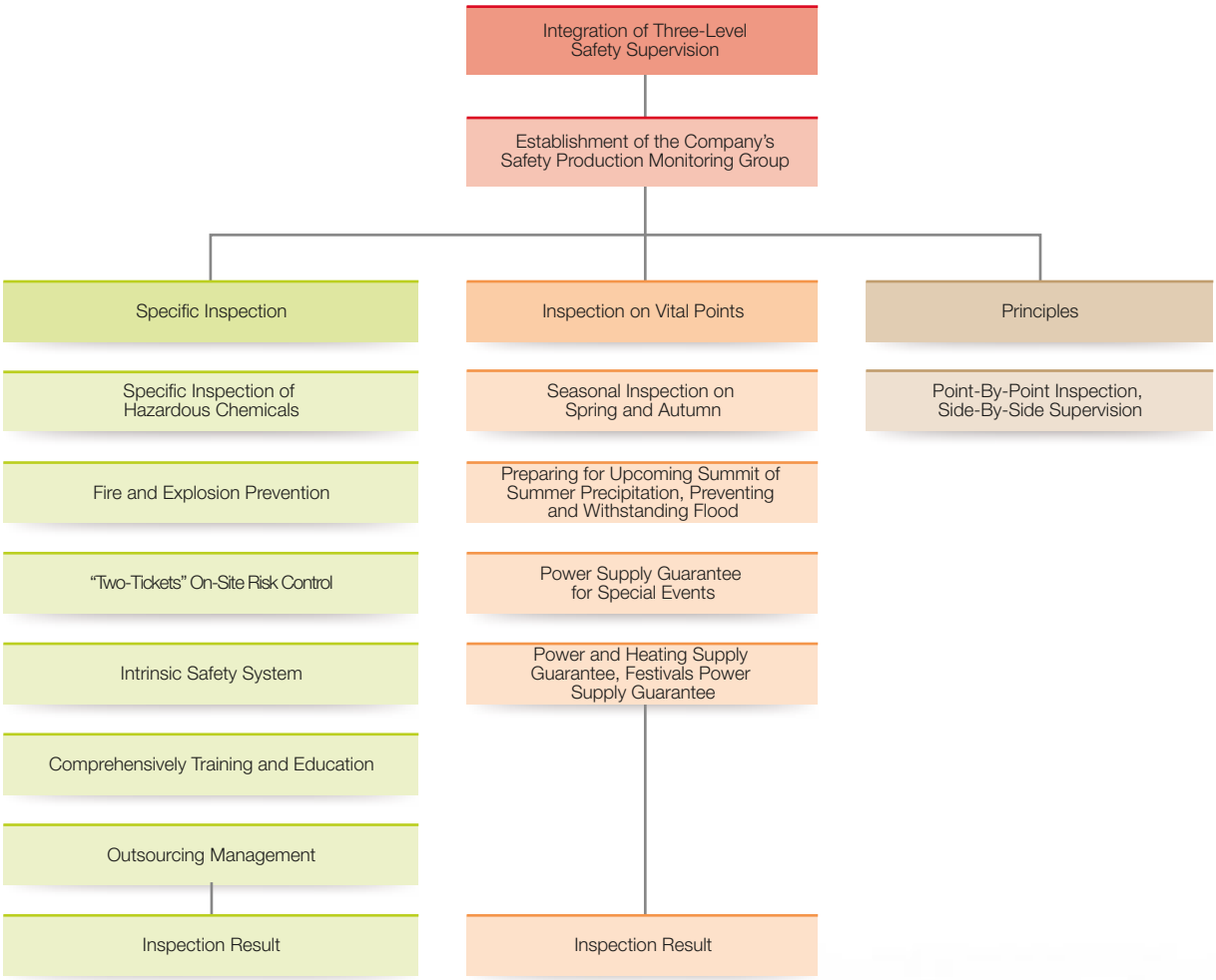
6.2 Improving an Efficient Mechanism

The Company and all its affiliated units have established a robust safety management structure and a complete set of safety supervision mechanisms to fulfil safety supervision responsibility. As the management, construction and operation maintenance team and other business functions incorporate the safety production principle with their business line to better form a safety production protection system. The interaction of safety supervision and protection ensures the accomplishment of safety production targets.

Establishing a Three-Tier Safety Supervision System

Huaneng International has set up a Committee of Safety, Occupational Health and Environmental Protection, which mainly aims to adhere to the policy of "safety first, prevention first, comprehensive management", implement the national, industrial, and Huaneng Group's guidance and arrangements on safety production, organise and guide the Company's work of production safety, analyse and propose essential decisions and measures concerning production safety, and coordinate and solve critical problems therein.

Under the leadership of the Committee of Safety, Occupational Health and Environmental Protection, the Company has built a three-level safety supervision system made up of "headquarters – regional branches – grassroots business units" to ensure intrinsic safety in production and operation. The Company takes charge of system design, business strategy, on-site supervision and work assessment. In contrast, regional branches are responsible for implementing the Company's various safety management requirements, work plans and deployment decisions, giving full play to the role of organisation and coordination as well as specifying the major responsibilities of their affiliated grassroots units. Grassroots business units are tasked with implementing the Standard on the Fulfilment of Production Safety Responsibilities (《各級人員安全生產責任到位標準》), ensuring all personnel's fulfilment of their respective safe production responsibilities and enhancing their consciousness of responsibility.



Safety Production Target Responsibility System

According to the target responsibility system concerning production safety, the Company carries out monthly pre-assessment and yearly final assessment to guarantee responsibilities are fulfilled at every level. The Company's target of safety production abides by "one vote veto", which refers to a quantitative evaluation of production safety performance of each unit with a starting score of 100 points. If there is any injury or death accident of employees, injury or death accident of contracted personnel for which the Company is responsible, serious equipment accidents for which the Company is responsible, fire disasters, environmental pollution and damage accidents, 100 points will be deducted.

6.3 Implementing Safety Measures

Huaneng International sees safe production as paramount. The Company has taken comprehensive and effective measures to ensure safety production through system improvement, duties fulfilment, risk control reinforcement and emergency management, contributing to the continuous enhancement of safety production.

Overall Production Safety

Facing the breakout of COVID-19, the Company made concerted efforts for epidemic prevention and control, ensuring power supply in critical regions such as Wuhan during the epidemic. In line with the deployment in the State Council Work Safety Committee's Three-year Action Plan for Special Rectifications for Safety Production throughout the country, the Company implemented special rectifications, ensuring power supply during important events and periods. The Company also carried out flood prevention and control to defend against natural disasters and extreme weather. In 2020, there was no severe safety injury, or accidents that occurred at the Company.

Yueyang Power Plant Resolutely Fulfil the Social Responsibility of Flood Control and Disaster Relief

Yueyang Power Plant is located on the south bank of the downstream of the conjuncture of Dongting Lake and the Yangtze River, facing Bajiao Lake to the east. Not only undertaking the task of flood control and flood control for the 600-meter section of the Yangtze River dyke, but it also adjusts the water level of Bajiao Lake, which is a heavy flood control task. In July 2020, the Yueyang section of the Yangtze River received multiple rounds of flood peak transit brought by the most substantial precipitation since 1952. On July 11, the water level of Bajiao Lake was 29.55 meters, which was 0.17 meters higher than the historical high-water level. On July 28, the peak water level of the flood in Chenglingji was 34.74 meters, and the second-highest flood since the beginning of this century. The flood control situation was brutal.

Yueyang Power Plant thoroughly implements the essential instructions of Chairman Xi Jinping on flood control and disaster relief, promptly executes the instructions and requirements of the company and local government on flood control and disaster relief, and actively performs corporate social responsibility. All the staff and cadres of the Plant are ready to stand by, strictly continuously fight and carry out inspection of the responsible dike section, emergency disposal and other work. The Plant starts the circulating water pump to discharge the water of plana, actively assists the local government to prepare for flood control materials, helps the local government win a comprehensive victory in flood control and disaster relief, and ensures the safety of people's lives and property.

Yueyang Power Plant

Implement Safety Responsibility Assessment, Strengthen the Responsibility

In line with the State Council Work Safety Committee's deployment, the Company put ongoing efforts in safety responsibility assessments, developed position responsibilities, performance indicators and accountability mechanisms, and summarised and reported safety issues for rectification. The Company formulated the Three-year Action Plan for Special Rectifications for Safety Production (《公司安全生產專項整治三年行動方案》). The Company vigorously managed the "Two Lists" (potential risks and countermeasures) and carried out responsibility assessments. Meanwhile, the Company carried out unannounced or uninformed inspections following the principle of "Site Visit subject to Four Noes"[12], timely reported issues and fulfilled responsibilities for the purpose of rectification and improvement on safety production management.

[12] "Site Visit subject to Four Noes" refers to site inspection or visit by going straight to grassroots units or sites with no announcement issued, no notice given, no report accepted and no accompanying person required

Strengthen On-site Management and Control, and Improve Safety Risk Management and Control Ability

01 We urged each business unit to conduct on-site risk investigation and analysis to "identify potential dangers and quantify risks" from the perspectives of personal safety, equipment safety and environment safety based on the "Two Tickets" policy, as well as putting together a risk identification database and standardising the "Two Tickets" management process.

We continued to promote the construction of the "dual prevention" mechanism combining classified risk control and potential risk inspection and clearance, systematising and standardising potential risk inspection and classified risk control. In addition, the abilities of grassroots business units in risk identification, analysis and control were further improved.

02 Based on the construction of the dual prevention mechanism, the Company strengthened potential risk inspection and clearance and on-site supervision while standardising the "two-ticket, three-policy" management process for grassroots units. We took a zero-tolerance attitude towards non-compliance and imposed stringent controls on key areas, key procedures, key event periods, key positions and key persons to strengthen safeguards and prevent casualties. We focused on the investigation of fire risks in power supply, coal transportation, boiler fuel oil, lubricating oil, desulphurisation, hydrogen and other systems, as well as the management of liquid ammonia tanks to prevent accidents such as explosions of the four major pipelines and pressure vessels to minimise the risk of major accidents.

03 The Company continued a series of special treatment projects and special inspections, covering dangerous chemicals and major hazards, fuel systems, outsourcing standardised acceptance, metal supervision, flood prevention and control, fire safety and fall prevention to prevent the occurrence of accidents.

In addition, the Company promoted the construction of the safety production risk monitoring and warning system for hazardous chemicals, urged business units to sort out and classify their existing risk sources and connect to the government's safety production risk monitoring and warning system for hazardous chemicals in accordance with local governments' requirements and time limits.

04 The Company enhanced the safety management for natural gas pipelines and issued the Notice on Enhancing the Safety Management of Natural Gas Pipelines (《關於加強天然氣管道安全管理的通知》), strengthened the tour inspection on equipment pipelines, vigorously controlled the third party construction risk, established accountability for the safety management of natural gas pipelines, enhanced pipeline corrosion control and management and facilitated the implementation of internal and external inspection to ensure effective risk control for gas pipelines. At the same time, the Company organised experts to conduct special safety inspections in Suzhou Thermal Power Plant and Guilin Gas Turbine Power Plant.

Haimen Power Plant – Ensuing Safety Habits

Haimen Power Plant, as always, regards production safety as its "top priority". Adhering to the principle of "Clean Governance, Dual Responsibilities, Joint Management and Accountability for Dereliction" and intrinsic safety, the Plant advocated delicacy management to promote operational excellence. Haimen Power Plant continued to improve its safety policies, revising 225 management policies related to ISS. For better outsourcing management, the Plant organised an integrated safety management team composed of experts thereof and outsourcing personnel to conduct comprehensive risk control and safety supervision at all time through a three-level network of "cloud office + on-site supervision team + training experience platform". Concerning cultivating a safety culture, Haimen Power Plant carried out unique cultural practices such as "Safety Production Month", safety knowledge contests, typhoon and flood prevention exercises.

In recent years, the Plant, through collaborative innovation of "Industry-University-Research-Practice" between 12 subordinate "innovation studios" and the Chinese Academy of Sciences, Xi'an Thermal Power Research Institute Co., Ltd., Shantou University and other institutions, has been committing to resolving core technical difficulties in safety production and operation. Among 27 scientific projects established, the collaboration and coordination of a robot cluster composed of booster station patrol robots, central control room manipulation robots, and intelligent supervision robots have significantly contributed to production safety. During the epidemic, intelligent robots stuck to the frontline to fight the power supply epidemic, considerably reducing labour intensity and cross-infection risks. In addition, Haimen Power Plant has established a "5G Smart Power Plant Joint Innovation Lab" for in-depth application of 5G network in intelligent safety production, fulfilling the strategy of technology-driven safety with practical actions.

Haimen Power Plant

Enhancing Safety Risk Awareness, Improving Staff's Emergency Response

The Company revised the Emergency Management Rules (《應急管理辦法》), the General Contingency Plan (《總體應急預案》) and six unique contingency plans in accordance with the Management Rules on Contingency Plans for Production Accidents (Order No. 2) (《生產安全事故應急預案管理辦法》(2號令)) and the Rules on Response for Production Accidents (Order of the State Council No. 708) (《生產安全事故應急條例》(國務院令第708號)) issued by the Ministry of Emergency Management of China to further improve the compliance and feasibility of the policy and contingency plans. The Company acknowledged that theory and practice should be united. Therefore, it established related management rules and conducted a series of emergency exercises to improve emergency response capability.

The Company continued to promote scenario-based emergency exercises expanding from traditional accident scene emergency simulation to enterprise-local government cooperation in disaster relief, crisis response, and aftermath recovery. Based on such comprehensive scenario-based exercises, the Company identified issues, refining emergency response processes and enhancing the emergency response capacity and efficiency. The Company organised emergency exercises regarding black-start and liquid ammonia leakage in Laiwu Power Plant and Changchun Thermal Power Plant. In 2020, the research and application of construction technology for major emergency scenarios by Changchun Thermal Power Plant and Chongqing Liangjiang Gas Turbine won the first prize in technical innovation sponsored by the China Electricity Council.

6.4 Safeguarding Occupational Health

The occupational health of our employees has always remained Huaneng International's top concern. Based on compliance with the Labour Law of the People's Republic of China (《中華人民共和國勞動法》), the Production Safety Law of the People's Republic of China (《中華人民共和國安全生產法》), the Prevention and Control Law of Occupational Diseases of the People's Republic of China (《中華人民共和國職業病防治法》) and other laws and regulations, Huaneng International's affiliated units formulated the "occupational disease and hazard management standards" and the "occupational health supervision and management standards" in accordance with the requirements of the Company's intrinsic safety management system. We always put our employees' health and safety first by raising awareness of work safety and preventing hazards. The Company strictly implemented regular safety hazard inspection, hazard notification, prevention and control and offered regular health checks for positions with occupational disease and established a health monitoring file management system for positions at different levels to ensure that the occupational health and safety were under control.

All grassroots business units have set up occupational disease prevention organisations to implement occupational disease prevention responsibilities as well as identify and evaluate workplaces with occupational hazards against relevant standards to rate the hazards. Employees are provided with training on occupational disease prevention, while clear warnings are put up in workplaces with potential occupational hazards where regular inspection is carried out. Regular occupational health examinations, i.e., chest X-ray and hearing test, were conducted for employees in relevant production positions such as fuel supply, boiler operation and overhaul, and an established occupational health management database. The Company provided climbers or elevators in all new projects to reduce the possibility of specific occupational diseases (such as lumbar disc herniation) from the wind power industry. Projects already put into production were also required to have the equipment to reduce the staff's climbing exercise intensity and reduce the inducing factor for diseases.

Yangluo Power Plant – Epidemic Prevention and Control

Yangluo Power Plant regards epidemic prevention and control and power supply as its top priority. In strict accordance with relevant requirements, the Plant vigorously fulfilled special supervision responsibilities, designed and implemented feasible and effective supervision measures. The Plant required temperature measurement at the entry, conducted disinfection in key areas while maintaining adequate materials for epidemic prevention and control. Sticking to the policy of "Six Inspections", that is to conduct inspections from the following six aspects: temperature measurement at the entry, disinfection in key areas, material reserves for epidemic prevention and control, canteen dining inspection, epidemic controls at franchised units and effective implementation at all business units. The Company adopted the principle of "No Omissions in Temperature Measurement, Full Coverage of Disinfection, Sufficient Material Reserves, Distanced Dining and Normalised Measures" in its supervision. Yangluo Power Plant was awarded the honorary titles of "Model Unit of Central Enterprises in Combating COVID-19 Epidemic" and "Model Grassroots Party Organization of Central Enterprises". Comrade Jiageng Luo was awarded the title of "National Individual Role Model in Combating COVID-19 Epidemic".

Strengthening Epidemic Prevention and Control in Yangluo Power Plant

6.5 Improving Safety Awareness

Raising employees' safety awareness is key to the Company's safety management. Developing and encouraging employees to participate in the Company's all kinds of security activities to establish appropriate security behaviours is the key guarantee to create an intrinsic safety enterprise.

Safety Training Management Mechanism

Huaneng International's management team has incorporated safety education and training into the Company's annual and middle- and long-term plans, established double-level and triple-level educational and training mechanisms, and ensured the supply of required coaches, funds and training materials. The Company is responsible for preparing training plans according to the safety education outline, organisation of safety education and training, and recording and archiving of safety training. All business units of the Company ensure that employees receive adequate training. They adjust safety education plans and organise training for power plants, departments, and teams according to departments' and teams' production characteristics.

Provision of Safety Training

In 2020, given safety work priorities and difficulties, the Company carried out the following work: Firstly, the Company held numerous forums, activities and video training to exchange good practical experience and achievements regarding the "Implementation Guidance on Classified Control and Management of Safety Production Risk", "ISS for Infrastructure Construction", and "Emergency Scenarios Construction". Secondly, the Company revised the Measures for the Administration of Safety Training for Employees of Power Generation Enterprises (《發電企業從業人員安全培訓管理辦法》) to enhance and regulate safety training in power generation enterprises. Thirdly, the Company analysed the Selected Production Safety Accident Cases, timely published various accidental cases in the Intranet. They organised employees to learn from these accidents, thereby enhancing their safety awareness and skills and reducing the recurrence of the same kind of accidents. Fourthly, the Company organised two sessions of continuing education for certified safety engineers and qualification training for safety management, with a total of 286 participants, improving the ability of safety management personnel.

6.6 Enhancing Outsourcing Management

The Company is devoted to infrastructure safety management and promoted an intrinsic safety management system in this regard. In addition, the Company focused on the weaknesses in outsourcing safety management and system implementation to enhance outsourcing safety management. The Company strictly controlled the selection of outsourcing personnel and enhanced rectification measures for violations to ensure construction safety. The Company formulated the Regulations for the Safety Management of Power Engineering Construction for Huaneng Power International, Inc. (《華能國際電力股份有限公司電力工程建設安全管理規定》), specifying rules on how contractors fulfil safety management in contracting power engineering construction and regulating the accomplishment of the safety management target.

Strictly Manage Contractors' Qualifications

The Company ensures that only qualified contractors can participate in any project construction. Bidding is only open to contractors with qualifications, proven performance and adequate capabilities for the project. Those with a history of major safety accidents are prohibited from bidding for the Company's projects.

Strictly Manage Subcontracting

Any form of illegal subcontracting is strictly prohibited. Contractors assume overall responsibilities for on-site production safety. They shall strengthen on-site management and control by incorporating their subcontractors into its safety management system and implementing similar safety measures.

Strictly Manage Safety Training and Education

The Company requires contractors to launch safety production training and education and establish a safety training system and employee safety training filing records to continuously improve employees' awareness of safety and self-protection.

Deepen the Implementation of the Responsibility Subject

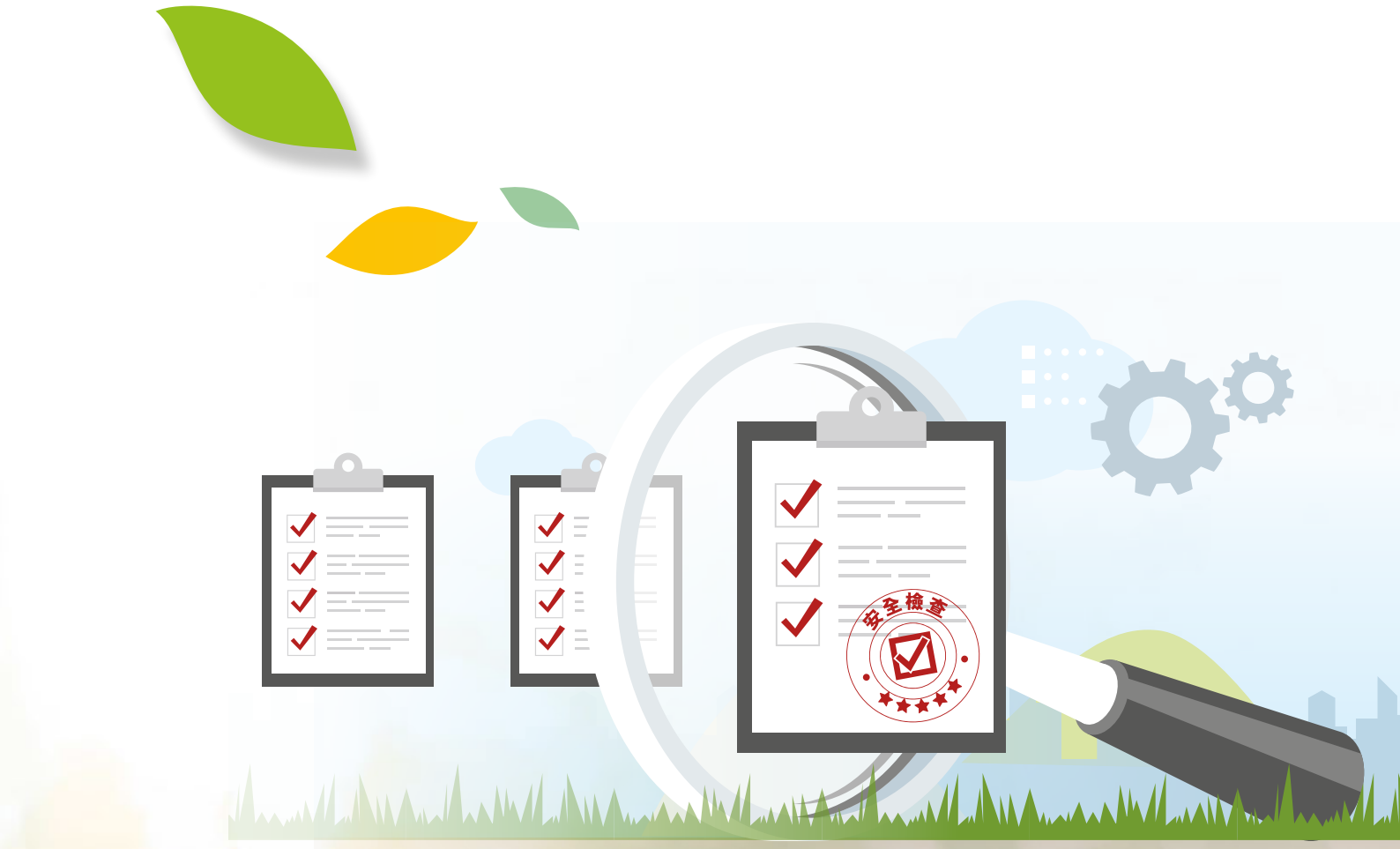
Contractors are required to establish a sound safety production responsibility system, specify safety management responsibilities for construction at all levels, and strengthen safety supervision and management, ensuring the effective operation of the safety supervision and assurance system.

Enhance On-site Safety Control

The Company implements closed management of construction sites by installing an access control system with face recognition to prohibit unauthorised personnel from entering the areas. The Company also prepares and approves a technical scheme for operation safety and fulfils technical disclosure for construction safety and on-site safety supervision to control safety risks of contractors effectively.

Enhance Potential Risk Inspection and Mitigation

The Company organises contractors to carry out a large-scale on-site safety inspection at regular intervals to assess timely, record and file the potential safety risks identified. The Company is responsible for supervising contractors to formulate and implement rigorous mitigating safeguards and actions plans to manage potential risks for closed-loop management of preventing potential risk.



07

Elaborately Building a Platform for Growth

Human resource is our first primary resource. The sustainable development of talents is the driving force to the Company's sustainable development. Human resource is essential to the success of the Company. Regarding employees as the foundation for the Company's long-lasting prosperity, Huaneng International is dedicated to building professional teams, prioritising employees' rights and interests, recognising employees' value and building a development platform to promote joint development of the Company and its employees.

7.1 Protecting Employees' Rights and Interests

We are devoted to the goal of "maintaining long-term, stable and good relationships with its employees" and the principle of "lawful employment and equal employment opportunity". We create an environment where everyone has a chance to contribute and achieve career development and self-worth. We are dedicated to improving employees' sense of fulfilment and happiness while continuously enhancing unity within the Company.

Lawful Employment Equity

The Company adheres to two major principles, namely lawful employment and equal employment opportunity, strictly abides by the Labour Law of the People's Republic of China (《中華人民共和國勞動法》), the Labour Contract Law of the People's Republic of China (《中華人民共和國勞動合同法》) and the Provisions on the Prohibition of Use of Child Labour (《禁止使用童工規定》), as well as the Administrative Measures for the Recruitment of College Graduates (Trial) (《高校畢業生招聘管理辦法(試行)》), signs employment contracts with all staff and prohibits the employment of any minor under the age of 16. The Company has consistently strictly implemented national laws and regulations on the minimum age limit and clarified the rights and obligations of both parties regarding labour and employment to avoid the risks of violation such as the use of child labour and forced employment at the institutional and operational levels. The Company provides equal opportunity and protection to staff with different nationalities, races, genders, religious beliefs and cultural backgrounds. We offer equal terms to male and female employees, oppose forced labour and job discrimination and adopt an equal employment policy through the entire employment period of each employee.

As of the end of 2020, the Company had a total of 57,874 employees, of whom 80% had received college qualifications or above. In 2020, no labour dispute arising from breaches of laws and regulations occurred.

Protection of Employee Rights and Interests

Upholding our "people-oriented" principle, the Company regards employees as the primary resource and has established a comprehensive and robust system to protect employees' fundamental rights and interests. We strive to be a caring employer and improve employees' loyalty, and we take employees' concerns to heart.

Basic Protection: In strict accordance with the requirements of the Labour Law of the People's Republic of China (《中華人民共和國勞動法》) and the Social Insurance Law of the People's Republic of China (《中華人民共和國社會保險法》) concerning employees' rights and obligations, the Company has set up several social insurances including basic pension, basic medical insurance, work-related injury insurance, unemployment insurance and childbirth insurance as well as housing provident funds, annuities and supplementary medical insurances to ensure that employees' rights are protected in the event of retirement, medical treatment, work-related injuries, unemployment or childbirth. In 2020, the Company did not have any social insurance violations or defaults.

Compensation System: In accordance with the Administrative Measures on the Total Salary (Trial) (《工資總額管理辦法(試行)》) and Administrative Measures on the Remuneration of Corporate Management (Trial) (《企業負責人薪酬管理辦法(試行)》), the Company, based on the employee's "position, performance, work efficiency and the principle of equality", has established an effective incentive mechanism under which employee's compensation is linked to the Company's operating result and the employee's individual performance. An employee's total compensation includes basic salary, bonus, and allowance paid on time and in full amount by the Company.

Right for Leave and Vacation: The Company and its subsidiaries have established sound leave systems in accordance with the state policy and local policy, including the Labour Discipline and Leave Management Measures for Headquarters Employees (《本部員工勞動紀律與休假管理辦法》) established by headquarters of the Company, to safeguard the employee's rights for leave and vacation. The standard working hour system or flexible and aggregated working hour system is adopted based on the Company's production condition and the employee's position to protect the employee's right to take leave. The leave system specifies that leaves shall include official holiday, paid annual leave, home leave, marriage leave, funeral leave, maternity leave, sick leave and personal leave, thereby protecting staff's right to take a vacation.

Democratic Management and Openness of Factory Affairs

The Company continues to deepen democratic management to promote a more open and transparent business. In 2020, the Company successfully held the 2020 annual employee representatives' conference. The Company's proposals were solicited from the employee representatives with a response and handling rate of 100% by the Company, fully activating employees' proactiveness and enthusiasm in participating in the Company's management. Huaneng International sets up a notice board on our website to provide business updates, thus protecting employees' rights to know, participate, express and supervise to promote joint development of the Company and its employees.

7.2 Promoting Talent Development

In the spirit of "human resource as the primary resource of the Company", Huaneng International vigorously promotes its talent-driven development strategy. With talent capacity building as the core and optimisation of talent structure as the main task, we develop talent resources, optimise talent allocation, improve talent ability quality, create an environment for talent growth by seising the three links of attracting, training and making good use of talents. In doing so, we can build a team of talents with excellent quality, which is well structured, professionally equipped, devoted to careers in Huaneng and in line with the Company's developmental and strategic needs.

Training and Development

To strengthen the construction of a training organisation system and further improve the three-level training system consisting of "headquarters – regional branches – grassroots business units", the Company has established eight group-level training bases (training classrooms) and three regional-branch-level training bases. All grassroots business units have training centres to actively carry out training related to technology, skills and management.

The Company strictly follows the Regulations on Team Leader Training (《班組長培訓規定》) and the Regulations on Production Worker Training (《生產人員培訓規定》) to facilitate a training that meets the needs of the Company and employees at the regional branches and grassroots business units based on the actual situation. Focusing on the critical tasks of the year, the Company has developed the 2020 training plan, actively and steadily promoting training related to professions, skills and management. Based on the actual situation, each regional branch has formulated its training plan, comprehensively summarising the training work of this year, studying and proposing training plans and ideas for the next year, to improve the training work further.

In 2020, the Company, regional branches and grassroots business units conscientiously fulfilled the annual training plan, coordinated and organised on-board training for recruits, business management training and production skill training. They also carried out various skill contests, technical competitions and on-the-job exercises where 1 employee was awarded the "National Technical Expert" title, 10 were awarded the "Power Industry Technical Expert" title, 21 were awarded the "Huaneng Group Technical Expert" title, 22 were awarded the "Huaneng Group Outstanding Operator" title, and 5 were awarded the secondary and third prize in the "ARC Cup" International Welding Competition. They also organised occupational skill appraisals where 228 employees received technician certification and 976 received senior technician certification. These activities have effectively improved staff's management capability, standards of business and production skills.

Career Development

The Company focuses on employees' career development. The Company continues to optimise the talent allocation and growth environment, provides diversified career development paths and further promotes the dual hierarchical promotion mechanism whereby employees can move up the corporate ladder either by post or job function. The system is aimed at stimulating employees to work hard and injecting vitality into the Company.

The Company makes more efforts to refine its talent system and mechanism and optimise the recruitment procedure and evaluation mechanism for professional and technical positions. The Company promotes employees with outstanding skill sets and performance or those whom their peers well recognise. Through this approach, the Company has built an excellent platform for talents to showcase their potential.

The Company continues to strengthen its core management team. Upholding Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and implementing CPC's roadmap in the New Era, we adhere to the basic principles of "evaluating candidates by their moral integrity and professional competence with priority given to the former and appointing those with good merits" to select and appoint management staff. Moreover, we persist in the correct orientation for the selection and appointment of people and concentrate on developing both the Company and Huaneng's business to select the management staff with the right political ideology, strong sense of duty and great performance. In addition, through grassroots practices and training, we continuously improve management's performance to manage complex situations to build a team of high-quality and professional management meeting the standards of qualified management in the new era who are loyal, honest and responsible.

In 2020, the Company strengthened talent development, selection and training of young management staff, enhanced the construction of management, deepened the cultivation of international talents, actively and steadily carried out training work, proactively carried out title management and talent evaluation work, and optimised employee recruitment to improve core management and professional teams' comprehensive skills and management capability, thereby facilitating talent flow and optimising human resource structure.

In the future, the Company will deepen the reform of the three-tier system (labour, personal and distribution systems), further improve talent cultivation mechanism, optimise talent development environment, strengthen talent resource development and encourage staff to continuously improve themselves in their positions to achieve self-realisation and joint development of the Company and staff.

7.3 Caring Physical and Mental Health

Employees are fundamental to the development of the Company. Huaneng International can continuously and steadily supply energy for economic and social development based on the hard work and dedication of all employees. The Company always adheres to the people-oriented development concept and vigorously implements the talent-driven development strategy to achieve staff and enterprises grow together, sharing the fruits of reform and development, which fills employees' work and life with happiness.

In 2020, the Company carried out the second national civilised family recommendation work, organised employees to participate in cultural and sports activities such as brisk walking in spring and autumn, and the collection of outstanding calligraphy and painting works to celebrate the 100th anniversary of the founding of the Party hosted by the Energy and Chemistry Trade Union. At the time of Women's Day, the Company actively organised female employees to participate in the "Shu Xiang Women's Day" reading activity with the theme of "Quality Improvement through Reading, New Achievements through Striving". Through these activities, the Company continuously improves the cohesion and centripetal force of employees and makes positive contributions to the high-quality development of the Company.

Abundant Staff Activities

The Company puts efforts in serving the employees by actively conducting employee visit and providing assistance to employees in difficulties on festivals, to boost the harmonious development of employees and the Company and the social harmony. The Company regards the life safety and health of employees as the priority. In 2020, we actively implemented the prevention and control work of COVID-19, timely purchased and distributed preventive supplies to employees, focused on the physical and mental health of overseas employees, and supported personnel stationed in Singapore to reserve pandemic prevention and living supplies.

08

Value Creation through Joint Efforts

As a responsible corporate citizen, Huaneng International has always adhered to the harmonious development concept of "serving the nation, benefiting the society, seeking multiple wins and growing together". We fully consider and effectively respond to the demands of stakeholders and actively devote ourselves to serving or operating areas. Furthermore, we cooperate with stakeholders to push forward economic and social development, share development fruits to give an impetus to build a harmonious and win-win society.

8.1 Deepening Supply Cooperation

Building trusted and cooperative relationships with suppliers are crucial to realising the Company's strategy. Our policy is to remain open, fair and just in working with suppliers, and we emphasise effective communication to strive for suppliers' understanding and recognition of the Company's corporate values and culture. We hope to maintain long-term and mutually beneficial relationships with suppliers and jointly promote the stable and sustainable development of the industry.

The Company's supplier management of materials, service and engineering required in production, infrastructure and business activities emphasises the importance of "classification, rigorous acceptance control, quantitative assessment and dynamic maintenance". In 2020, the Company broke through barriers between the grassroots business units of the regional branches. By abolishing the grassroots business units' supplier database system, which made regional branches solely responsible for establishing the supplier database, and to promote the sharing of suppliers on a regional basis comprehensively.

Supplier Development

The Company solicits eligible suppliers through various channels, such as procurement guides, mass media, product launches, product showcase (sales) events, industry associations, employee recommendations, public tenders and supplier liaison. We conduct supplier stocktakes and analysis each year to try to identify more high-quality suppliers.

Supplier Acceptance

The Company's business units at all level impose stringent controls on supplier acceptance. Only suppliers with a good reputation, advanced technologies, excellent product performance and strong ability to perform are accepted, and accepted suppliers are scrutinised for the legality of their business operations and the authenticity of their qualifications, among other things.

Supplier Selection

We select suppliers in an open, fair and just manner, considering their environmental and social impact. Procurement activities are classified into two categories, namely tendering procurement and non-tendering procurement. Tendering procurement includes open tender and invitation to tender, while non-tendering procurement includes competitive negotiation, quotation and single-source procurement.

Tender projects shall be conducted openly according to the law, related work procedures shall be carried out in strict accordance with national laws and management systems of the Company, management and operation shall be rigorously separated for restriction and balance, and all procurement activities shall be implemented publicly through the procurement management platform and e-commerce platform to achieve the goal of "every effort shall be made for tender and all activities shall be carried out publicly".

The Company requires all suppliers taking part in a tender to have the ISO 14001 environmental management systems certification and the ISO 9001 quality management systems certification. Suppliers included in the List of Enterprises with Serious Illegal and Dishonest Acts by the industry and commerce administration authorities in the National Enterprise Credit Information Publicity System, or the List of Dishonest Persons Subject to Enforcement by the Supreme People's Court on the website of "Credit China" or credit information sharing platforms at all levels are prohibited from participating in procurement activities. And the tendering documents or response documents of those who have participated in procurement activities are invalid. Suppliers whose related relationships are prohibited by law and agents and suppliers sub-authorised are prohibited from participating in the procurement activities of the same project. And the tendering documents or response documents of those who have participated in procurement activities are invalid.

Supplier Assessment

Supplier assessment is based on the "user assesses" principle. Based on Huaneng's procurement management platform, the Company's various business units conduct comprehensive and annual assessments on the project implementation of suppliers who have contractual relationships with each unit. Suppliers will receive assessment feedback through the e-commerce platform, which serves as an essential reference for future procurement.

Supplier Monitoring

The Company conducts assessment and supervision on issues relating to supplier integrity, quality, deliverables and services. In any malicious behaviour, the Company will impose corresponding penalties depending on the severity of those issues, and suppliers will receive assessment feedback through the e-commerce platform.

Coal Procurement

As a large power generating company, Huaneng International places much emphasis on fuel supplier management. The Company formulated the Fuel Supplier Management Measures (《燃料供應商管理辦法》), which specify the classifications of suppliers and their corresponding management measures and regulate the supply channels and procurement activities for fuel purchase. Suppliers are generally divided into four categories: A: strategic suppliers, B: general long-term suppliers, C: key market suppliers, and D: general market suppliers. The Fuel Supplier Management Measures (《供應商管理辦法》) also stipulates responsibilities for the development and review of suppliers at all levels, selection criteria, supplier approval and decision-making institutions and procedures, supplier assessment, supplier upgrading and downgrading, exit mechanism, etc.

Based on the actual situation of the electricity-coal market, Huaneng International implements the procurement mode of "long-term agreement + spot" in fuel procurement. Aiming at large coal mine operators, the Company negotiates directly with the suppliers to sign long-term agreements. And procurement is carried out in spot trading through open tender, tender follow-up and tender negotiation. To avoid causing substantial disturbance to the market during the process of fuel tender, Huaneng International controls the procurement scale of each batch, selects representative coal types and flow directions each time, and creates a competitive procurement environment. In doing so, Huaneng International finds out a low market price and reduces central procurement price. At the same time, Huaneng International performs tender follow-up and tender negotiation with competent suppliers at the tender price to keep the source of goods in batch and meet the demand. Through the procurement mode of open tender, tender follow-up and tender negotiation, Huaneng International not only finds out the lowest market price but also expands the procurement volume at such price, yielding an ideal procurement fruit. Therefore, our tendering price is the market signpost of price.

The Company selects suppliers with great care and carries out the authorised approval procedures for shortlisted suppliers. Priority is given to state-owned large mine operators and large coal mine operators, and a "plant-mine direct supply" model is adopted. In our view, state-owned large mine operators are more able to fulfil contracts, have more stringent product quality controls, are more compliant with laws and regulations and are more likely to take social and environmental responsibilities. On the other hand, large coal mine operators are subject to stringent environmental protection requirements imposed by the state concerning their planning, design, infrastructure, exploitation and goaf management. There is also a specific set of requirements for the recruitment of miners in large coal mines. Only those coal mine operators that meet these requirements are allowed to operate and construct. After phasing out unproductive coal mine operations in recent years and releasing advanced production capability, coal production work has further improved in terms of quality, environmental protection standards, safety and labour protection. By selecting state-owned large mine operators and large coal mine operators, we ensure that suppliers fulfil their social, environmental, and labour protection responsibilities and obligations.

Regarding the monitoring and management of suppliers, the Company's subsidiaries assess suppliers each year in terms of coal supply stability, contract performance, contract fulfilment, production volume, procurement pricing and dispute resolution. The Company's fuel supplier assessment principles include: (1) Classified management; (2) User takes responsibility; (3) Regular assessment; (4) Dynamic management with an exit mechanism. The Company's various business units perform fuel supplier management inspections from time to time, examining: (1) Whether the relevant supplier management system is sound, whether the decision-making institutions at all levels of supplier management are established, and whether the institutions operate normally; (2) Whether an implementation of such system is in place and whether the access work is standardised; (3) Whether fuel supplier assessments are objective and accurate; (4) Whether dynamic management of suppliers is carried out based on assessment results; and (5) Whether the exit mechanism is put in place.

Always taking the green development concept of "energy saving, emission reduction, clean and environmental protection" as the guide, Huaneng International regards environmental protection as a prerequisite for the survival and development of the Company with the basis on national conditions and energy reform trends. Correspondingly, the coal-fired structure is optimised ceaselessly during the development process to improve resource utilisation efficiency. In the process of fuel procurement, strictly abiding by the Interim Measures for the Quality Management of Commodity Coal (《商品煤質量管理暫行辦法》), Huaneng International prohibits the purchase of low-quality coal that fails to meet the national control standards while encouraging the use of high-quality resources of high-calorie, low-sulfur and low-ash.

8.2 Providing Quality Service

Huaneng International is devoted to providing power grid companies and other downstream enterprise consumers with high-quality power products and services in sharing the Company's achievements with clients whilst ensuring a safe and stable power supply.

The Company adopted the following approaches to improve customer service quality and customer satisfaction and gain greater access to the end customer market.

1. The Company enhanced strategic cooperation with major corporate clients to expand sales channels and customer resources.
2. The Company strengthened the maintenance of customer relationship by an in-depth understanding of customers' electricity demand whilst focusing on maintaining our financial creditability in electricity transactions to build trusts with customers.
3. The Company enhanced customer satisfaction and strived to satisfy the service experience of different customers by providing more professional value-added services. Up to now, we have established 19 provincial-level electricity distribution companies and 16 regional-level electricity distribution companies.

8.3 Fulfilling Social Responsibilities

As a responsible citizen enterprise, Huaneng International upholds its commitment to "serving the nation, benefiting the society, seeking multiple wins and growing together" by actively responding to the national call, making concerted efforts for pandemic prevention and control and poverty alleviation assistance, fulfilling our social responsibilities and fostering social harmony. In November 2020, the Third Beijing Responsibility Exhibition, guided by the Corporate Social Responsibility Research Centre of the Chinese Academy of Social Sciences and hosted by the China Social Responsibility 100 Forum, were held in Beijing. Huaneng International won the "2020 Responsibility Jinniu Award – Social Responsibility Report Leadership Award".

Pandemic Prevention and Control

The CPC Central Committee and the State Council are highly concerned with the precarious situation of the rapid spread of COVID-19, and containment of this pandemic is an urgent priority. In such a period of national crisis, the Company quickly responded to the State-owned Assets Supervision and Administration Commission of the State Council donated RMB5 million to the Hubei Charity Federation. Hubei Branch, Chongqing Branch, and Singapore Tuas Power Ltd. also made generous donations, both in monetary and goods, to the front line of the epidemic. We actively participated together to overcome difficulties by providing solid economic support for pandemic prevention and control.

Poverty Alleviation Assistance

In accordance with the relevant poverty alleviation work documents of the Group Company and the State-Owned Assets Supervision and Administration Commission as well as the Company's actual condition and local government requirements, and based on the actual circumstances, Huaneng International formulated the Implementation Plan for the Decisive Victory over Poverty Alleviation (《决戰決勝脱貧攻堅工作實施方案》), clarifying the objectives and tasks and refining the measures to promote the implementation of the poverty alleviation work. In 2020, the payment for donation made in the name of the Company within China for poverty alleviation amounted to RMB2,731.90 ten thousand.

Reject "Food Waste"

In 2020, in order to thoroughly implement General Secretary Xi Jinping's important instructions to stop food waste, the Company held a commitment signing activity to reject "food waste", advocating employees to save food and reduce waste.

Commitment Signing Activity to Reject "Food Waste"

The New Model of poverty alleviation in Jiangxi Branch

The assistance team of the Jiangxi subsidiary in each Village actively involved providing assistance and care to the scattered and poor sales of agrarian products in poverty-stricken areas. While actively advocating all subsidiary cadres and employees to purchase agricultural products in poverty-stricken areas, the Jiangxi subsidiary jointly promoted the "Canteen Entry" and "E-Commerce + Poverty Relief" Model with external companies to open up multiple channels for villagers to increase their income. Scattered household agricultural products were gathered by local villages, packaged by the county's agricultural product e-commerce enterprises named "Yinongshe" and "Qiantianbaiyuan" to form a brand, which was promoted and sold through the e-commerce platform. The Jiangxi subsidiary's staff canteen also made procurement of locally produced rice, dried fish and other food for daily consumption to help villagers increase their income. In 2020, the Jiangxi subsidiary helped the villagers to generate an accumulative fund of RMB183.09 ten thousand through this poverty alleviation event.

Working Teams Stationed in Villages Purchasing Agricultural Products from Households in Poverty

Zhejiang Branch Poverty Alleviation Project in Shan'ao Village

Shan'ao Village, which in Shangtian Town, Fenghua District, Ningbo City, Zhejiang Province, has a long history of green tea planting with high-quality. The scale of tea planting in the village is about 800 mu, but Shan'ao Village's collective economic income is almost zero. Zhejiang Branch implemented the Shan'ao Village Tea Deep Processing and Learning Education Base Project at the beginning of 2020 and invested a total of RMB55 ten thousand in repairing a tea processing base and purchasing a batch of tea processing equipment to help realise the goal of making profits for the collective economy of the village and benefiting the poor households in the village. In the first half of 2020, the poverty alleviating tea factory project processed and sold more than 850 kilograms of tea in total, with a sales volume of nearly RMB50 ten thousand and a profit of RMB9.1 ten thousand. This project has led more than 100 households in the village to benefit from the tea cultivation, picking and processing industry chain and significantly increased the economic income of about RMB60 ten thousand per year. Meanwhile, Zhejiang Branch also helped more than 10 low-income farmers in Shan 'ao Village learn to master fresh tea picking, tea picking, tea packaging, and other technologies to replace the relief with work increase their income by about RMB5 ten thousand.

Shan'ao Villagers Sending a Banner to Zhejiang Branch

Anhui Subsidiary Expressing Sympathy and Solicitude for the Poor Villagers in Flood and Providing Care to Their Children

Huangchong Village in Anhui Province, a targeted village of assistance of Anhui subsidiary, suffered from the flood in 2020, which resulted in road interruption, house submergence, acres of crop failure and severe ravage of infrastructure. Party members, cadres and staff of the Anhui subsidiary actively made donations for the disaster-stricken people to share weal and woe, demonstrating the responsibility of the enterprise with love and kindness. Cadres and employees raised a total of RMB11.82 ten thousand to help people in the flood-stricken areas overcome difficulties, build their home anew, and resume production and life. In September 2020, the Anhui subsidiary organised Party members and employees to visit Huangchong Village. They visited 2 students with difficulties from the poor families due to the flood and donated study desks and chairs, desk lamps, clothes for autumn and winter, and other learning and living necessities to help them to over the difficulties.

Anhui Branch Donating Money to Huangchong Village

09

Dedicating in Building an International Brand

Huaneng International successfully acquired 100% equity in Singapore Tuas Power Ltd. (“Tuas Power”) in 2008. Tuas Power is one of the three major power generating companies in Singapore and one of Singapore’s major public utility and environmental service providers.

About Tuas Power

Tuas Power owns Tuas Power Station and Tembusu Multi-Utilities Complex (TMUC). In 2020, the total market share of Tuas Power in the power generation market was 21.4%.

Tuas Power Station has been providing safe, reliable and efficient electricity supply to Singapore since 1999. The Station currently has five units of gas-fired Combined Cycle Plants (CCP) in operation that contribute to the country's electricity demand at a high reliability performance of over 99%.

The Tembusu Multi-Utilities Complex commenced operation in 2013, and it serves the petrochemical industries in the Tembusu area of Jurong Island. TMUC comprises a Biomass Clean-Coal (BMCC) cogeneration plant, water treatment plant and wastewater treatment plant, which provides different types of utilities – electricity, steam, high-quality industrial water and demineralised water for industrial customers. In respect of the provision of steam, TMUC provides steam at different pressure ratings to meet customers' demand. This is achieved by using steam turbine generator to step down the high pressure steam to a lower pressure steam. At the same time, power is being produced by the generator. This co-generation process helps TMUC to attain a high plant efficiency.

Going beyond energy, Tuas Power enlarged its operations to cover multi-utility, environmental, oil terminals and storage and oil tank lease services – all of which harness cutting-edge technologies and world-class practices to power today's industries.

Tuas Power emphasises efficient and environmentally responsible energy solutions for modern business and industrial needs. Tuas Power insists on conducting operations in an environmentally responsible manner through maximising plant efficiency, resource conservation, reducing waste and controlling emissions. The systems of both Tuas Power Station and TMUC for the management and planning of its environment, occupational health and safety have been certified by OHSAS 18001 (Occupational Health and Safety Assessment Series) certification and ISO 14001 (Environmental Management System) certification. While ensuring that laws and regulations are complied with, these certifications help to identify key procedures and HSE issues that need to be improved in order to mitigate the health and safety risks and prevent safety incidents in a sustainable manner.

In 2020, Tuas Power has had no reportable environment-related incidents. Tuas Power will continue to enhance environmental protection and safeguard measures.

Energy Conservation

Energy Conservation Efforts at Tuas Power Station

Tuas Power Station had initially developed two units of fuel-oil fired steam generating units in 1999. These were the most efficient oil-fired units during that time. Each had a unit efficiency of 34%. With the availability of natural gas and development of combined cycle power plants, the Station adopted a strategic transformation to more energy-efficient and cleaner power generation. Since 2000, the Station started developing combined cycle power plants, and by 2013 owned five most advanced F-class CCP generation units with an average efficiency of 48.5%. With the development of the efficient combined cycle power plant, the two units of less efficient oil-fired units were relegated to standby units and were deregistered and decommissioned. Tuas Power Station also uses well tested and calibrated thermodynamic models to perform off-line heat balance calculations to monitor the efficiency performance for each of the CCPs. Tuas Power Plant was able to develop a software named "Load Optimiser", to automatically calculate the load of each generator unit based on the overall load required during a specific trading period to minimise fuel consumption and maximise the overall. The Trading Department has been using the load optimiser to calculate the generator units' actual loads for price quotation since March 2019. After the use of load optimiser, the overall efficiency of the power plant improved by about 0.1%. Tuas Power Plant also plans to have exchange and experience sharing sessions with Huaneng Group's domestic power plants to improve its staff's capabilities in power plant performance monitoring and analysis.

In November 2019, Tuas Power Plant has been certified to attain the ISO 50001 energy management system.

Tuas Power Station

Energy Conservation Efforts at TMUC

"Located on Jurong Island, Tembusu Multi-Utilities Complex is the first biomass and coal-fired power plant in Singapore built by Huaneng International whose surrounding environment remains free of pollution."
– Tembusu Multi-Utilities Complex

"By bringing its world-leading technology and industry experience in biomass and coal-fired power generation to the Tembusu Multi-Utilities Complex, Huaneng International has made history and transformed Singapore's power development."
– Comments made by Zijian Liang, the Former Director of Energy and Chemical Industry Department of the Economic Development Board of Singapore

In 2019, TMUC launched the Phase-2 digitalisation project to improve efficiency and reduce heat loss. The project completed in 2020 includes:

1. Apply the online performance monitoring and production optimisation system to improve the power plant's performance and heat efficiency.

2. Monitor the performance of steam trap in the steam pipe network so that O&M is able to take prompt actions to rectify faulty steam traps to reduce steam/heat loss.

Other energy conservation initiatives completed in 2020 includes installation of a bypass line between the backup boiler (BUB)'s main steam header and LP steam header to allow a minimum stable steam flow while the BUBs are on standby and reduce the discharge loss of condensate. In addition, the drainpipe of the steam trap between the main steam header and BUB steam header was modified and shortened to minimise heat loss and discharge loss.

The above initiatives demonstrate TMUC's continuous effort in improving its plant efficiency and reduce heat losses.

In November 2018, TMUC has obtained ISO 50001 energy management system certification, which fully reflects the enterprise's unremitting efforts and achievements in implementing energy saving and compliance.

Tembusu Multi-Utilities Complex

Emission Management

Greenhouse Gas Management

With the installation of five efficient gas fired CCP generating units in operation and decommission of the two oil-fired units, Tuas Power Station's carbon emission factor has decreased and is now lower than that of the national average of all power plants in Singapore.

The usage of 20% carbon-neutral biomass (Palm Shell & Woodchips) is a mandatory requirement by the local authority to lower the carbon footprint of TMUC. By co-firing 80% coal with 20% carbon-neutral biomass, TMUC has lowered the carbon emission and thus lowered the carbon tax. To remain competitive, TMUC gradually increased the proportion of wood chips in its fuel mix. An increase usage of wood chips provided greater flexibility for fuel mix ratio to maintain a higher percentage of carbon-neutral types of biomass fuel and reduce fuel costs.

In accordance with the measurement and reporting requirements for greenhouse gas emissions of Singapore's National Environment Agency, Tuas Power and TMUC submitted their plans and supporting documents for the measurement of greenhouse gas emissions to the Singapore authorities and got approvals in December 2018. Starting from 2019, Tuas Power and TMUC will submit their annual emissions reports based on these approved documents and pay the relevant carbon taxes accordingly.

Other Exhaust Gas Management

In 2020, Tuas Power Plant only operated five units of natural gas fired CCP generators and decommissioned all oil-fired generator units to achieve negligible emission of sulfur dioxide. TMUC reduces NOx and SO_2 emissions by using advanced Circulating Fluidized Bed (CFB) boiler, and purchasing of low-sulfur low-ash coal. The low furnace temperature of CFB boilers and the use of low-sulfur low-ash coal have ensured a low NOx and low SO_2 emission. Utilisation of high efficiency bag filter at the CFB boilers have ensured the emission is within the compliance limit. TMUC is able to meet the stringent air emission limits set by "the Air Impurities Regulation of the Singapore Environmental Protection and Management Act" (《環境保護和管理法案》).

Ash Recycling and Utilisation

In Singapore, the landfill of the ash generated in industrial process is prohibited. TMUC has achieved 100% comprehensive utilisation of ash (fly ash and bed ash) by working together with local building materials company.

Tuas Power had initially conducted the clean coal-biomass combustion pilot trials in 2008 to gather fly ash samples for companies to explore feasibility of use. In 2014, the fly ash application (in collaboration with an established local cement/concrete company) in blended cement finally got approval from local authorities, the Building and Construction Authority (BCA) and the National Environmental Agency (NEA).

In 2016, TMUC collaborated with an established local cement/concrete company to use the bed ash in a sustainable concrete application that was approved by the authorities such as BCA and NEA. The bed ash from TMUC are used as an alternative to fine aggregates or sand in concrete production, complied with EN12620:2008 Specifications of Aggregate for Concrete standard. In parallel, the plant has also put in effort to re-cycle the bed ash progressively in order to reduce bed ash generation. The BA generated has reduced from 300 ton/month to 100 ton/month till date.

Wastewater Management

In the case of water treatment, the TMUC project has established wastewater treatment facilities to treat the wastewater produced internally and the wastewater generated by the petrochemical industry in compliance with relevant regulations.

To leverage on the well-designed water cycle and demonstrate TMUC's effort in water conservation, customers are incentivised to return clean condensate for TMUC's steam production. High temperature return condensate from customers is used to pre-heat deaerator feed water to improve efficiency. Boiler blow down water is recycled back to the Water Treatment Plant as an alternative source of raw water. Partial treated water from the Wastewater Treatment Plant is being reused for plant washing in TMUC Site 2.

Customer Service

Since 2003, Tuas Power has been serving many groups of customers from residential customers, individual businesses, to developers, landlords and tenants of commercial buildings. In a recent customer satisfaction survey by Singapore's Energy Market Authority, (in November 2020) Tuas Power has been rated 4.5 stars (5 stars in total) for two consecutive years from 2019.

The Tuas Power Green Programme

The Singaporean government earlier announced that starting from 2019 onwards, a carbon tax of SGD 5 per ton of carbon dioxide equivalent would be imposed on greenhouse gas emissions. In response to Singapore government's attention to greenhouse gas emission, Tuas Power has stepped up energy saving and emission reduction efforts. The Tuas Power Green Programme is developed to provide customers with a wide range of various energy solutions, including green consultancy service and lighting solution.

The green consultancy service is customer focused, and encourages companies to undergo energy audits to maximise energy efficiency. It also helps them identify the basic design of their buildings and suggesting the functional improvement, and bring incremental value to customers. The lighting solution aims to help customers achieve more than 30% of energy-saving effectively through changing simple details, such as using energy-saving lighting and intelligent lighting system instead of current traditional lighting systems, so as to reduce energy consumption and lower costs for the customers.

Integrated Energy Management System (IEMS)

Tuas Power introduced a comprehensive energy management system in January 2016, with the implementation of automated metering infrastructure for commercial buildings. The meter is able to record electricity consumption on a half hourly basis in real time, for customer to review through a mobile application, enabling changes in energy usage to be activated as part of energy efficiency. The integrated energy management system, with the automated metering infrastructure provides enhanced service to customers since human input for meter reading is not required, efficiency, and billing accuracy is also improved. After research and studies from visiting Europe to understand best practices, Tuas Power employees reviewed and developed the system integrating the current operational requirements and customers request into the IEMS to better meet the needs of local customers.

Customer Information Protection

In handling customer information, Tuas Power enters into an agreement with the contractor to protect customer information. Its own employees are subject to the same requirements as the contractor, and comply with the Company's governance policies that protect customer information.

Community Building

Tuas Power is closely linked to the community and provides financial support charity and non-profit organisations. Some of the beneficiaries include the Singapore Children's Association, Metta Preschool @Punggol and other educational institutions. Tuas Power also cooperates with government statutory boards like the Singapore Energy Market Authority (EMA) to provide student sponsorships for local universities and polytechnics, and supports the horticultural research and conservation through the Garden City Fund in order to protect Singapore's green environment.

International Communication

There is frequent interactions and mutual assistance between Tuas Power and the Company.

Pre-COVID in 2019, several groups of technical and engineering employees from Tuas Power underwent training on the Company's operational processes, and will continue to communicate digitally on such matters in 2020. Tuas Power has also consulted with technical experts from the Company to further improve and strengthen operational efficiency of the Tuas Power Station and TMUC.

According to its own experience with navigating the gradually deregulated power market in Singapore, Tuas Power has given many in-depth talks to various departments within the Huaneng Group. Tuas Power shared the experience of Singapore's power market reform with relevant Chinese government agencies and the Company's business partners. Topics such as Singapore electricity market structure and operation, electricity retail market competition and differentiated competition with competitors were presented and discussed.

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Sound Development for a Far-reaching Success and Promising Future

We look forward to the future, and continuously accumulate experience for long-term sustainable development. We forge ahead and make sound development for a far-reaching success. The electric power industry is closely related to national development and people's lives. Although it has existed for more than decades, it is still vibrant. As a responsible enterprise, we will continuously explore our potentials and improve quality and efficiency. Facing the current co-existing situations of both risks and opportunities, Huaneng International, through our continuous hard work, has achieved positive performance and gained valuable experience in 2020 from implementing our practical objectives and strategic plan whilst adhering to steady progress, promoting transformation and upgrading, actively carrying out reforms and innovations.

Sound Development for a Far-reaching Success and Promising Future

In 2020, in terms of size and performance, the Company's controlling generation capacity reached 113 million kW, with operating revenue of RMB169.446 billion, operating expenses of RMB155.734 billion, and net profit of RMB2.611 billion, which has a year-on-year growth of 135.6%. The total assets exceeded RMB430 billion, the installed capacity of low-carbon clean energy accounted for 20.6%.

In terms of operations, the Company's power generation business has achieved operational excellence across the equipment availability factor increased by 1.52 percentage points year-on-year, the number of unplanned power outages of thermal power units decreased by 13% year-on-year, maintains industry-leading benchmarking of leading energy consumption indicators; Our international business operating level achieved continuous enhancement, and Tuas Power ranked first in both the power generation market and the electricity retail market in Singapore.

In terms of corporate governance and talent management, the Company forms a scientific and complete modern management system and mechanism. The contemporary enterprise system with Chinese characteristics has been improved; corporate governance is standardised and transparent to enhance performance management, financial management, risk management and other overall management. The Company adheres to high-end leading, general development and makes constant efforts in the construction of three talent teams of management, professionalism and skills by intensifying the selection and training of young cadres, and build a talented team that is loyal to the cause of Huaneng, in line with the strategic needs, reasonable structure, professional supporting, quality, and rich in creative vitality.

In terms of brand prestige, the Company's brand communication and promotion ability has been significantly enhanced, and brand awareness and reputation have been continuously improved. In addition, the company has comprehensively fulfilled its social responsibilities, showing its corporate responsibility in poverty alleviation assistance, voluntary public welfare and fighting against epidemic diseases.

The "14th Five-Year Plan" is an essential period of strategic opportunity for the company to accelerate the pace of transformation and upgrading and promote high-quality development to a new level. The Company will bear firmly shouldering the mission to reach peak carbon, carbon-neutral for target lead, in-depth planning the development of the Company during the "14th Five-Year Plan", vigorously implement the strategy of innovation and development, green development strategy, security strategy of development strategy and operational excellence, further enhance strategic confidence, to strengthen the strategic management, adhere to the strategy of the bottom line, to nurture new machine in the crisis, the change in the new bureau, with greater confidence and determination to create a new situation development with high quality.

11 Appendix

11.1 About this Report

This report is the fifth "Environmental, Social and Governance Report" released by Huaneng International. This report focuses on the Company's efforts and contributions to the environment, society and governance, as well as our outlook for the future. We hope that through the publication of this report, we can strengthen communication and liaison with our stakeholders.

The Board of Directors and all the Directors hereby warrant that the contents of this report do not contain any false representations, misleading statements or material omissions and take joint and several liabilities for the authenticity, accuracy and completeness of the contents.

The Scope of the Subject of this Report

Huaneng International and its domestic and overseas affiliated branches and its wholly owned and controlled companies. Unless otherwise stated, the data disclosed in this report are about Huaneng International and its affiliated domestic subsidiaries and its wholly-owned and controlled companies.

Reporting Period

The Company's "Environmental, Social and Governance Report" is an annual report for the period from 1 January 2020 to 31 December 2020, and some of the statements and data are traced back to the previous year.

Reference Remarks

In order to facilitate the presentation and be easy to read, "Huaneng Power International, Inc." in this report is referred to as "Huaneng International", "the Company" or "we". "China Huaneng Group Co., Ltd." in this report is referred to as "Huaneng Group".

Content Compiling

The contents of this report are prepared in the light of the HKEx's "Environmental, Social and Governance Reporting Guide", the Global Reporting Initiative (GRI) Sustainability Reporting Standards (GRI Standards) and its supplementary guidelines for power generation industry. Currency used in this report is expressed in RMB unless otherwise specified.

Access to this Report

You can download the Chinese and English version of this report on Huaneng International's website at http://www.hpi.com.cn. This report is published in both Chinese and English. In case of any discrepancies among the different versions, the Chinese version shall prevail. If you have any questions or suggestions, please call 010-63226582.

11.2 Contents Index of the Environmental, Social and Governance (ESG) Reporting Guide by the Hong Kong Stock Exchange

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A1.2	Greenhouse gas emissions in total (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	44	5.3.4 Emissions Management
A1.3	Total hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	49	5.3.4 Emissions Management
A1.4	Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	47	5.3.4 Emissions Management
A1.5	Description of measures to mitigate emissions and results achieved.	41-49 81-82	5.3.4 Emissions Management 9 Dedicating in Building an International Brand
A1.6	Description of how hazardous and non-hazardous wastes are handled, reduction initiatives and results achieved.	47-49 81	5.3.4 Emissions Management 9 Dedicating in Building an International Brand
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A2	General Disclosure	37-39 40-41	5.3.2 Energy Consumption Management 5.3.3 Water Resources Management
A2.1	Direct and/or indirect energy consumption by type (e.g. electricity, gas or oil) in total (kWh in '000s) and intensity (e.g. per unit of production volume, per facility).	37	5.3.2 Energy Consumption Management
A2.2	Water consumption in total and intensity (e.g. per unit of production volume, per facility).	40	5.3.3 Water Resources Management
A2.3	Description of energy use efficiency initiatives and results achieved.	37-39 78-80	5.3.2 Energy Consumption Management 9 Dedicating in Building an International Brand
A2.4	Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency initiatives and results achieved.	40-41	5.3.3 Water Resources Management
A2.5	Total packaging material used for finished products (in tonnes) and, if applicable, with reference to per unit produced.	–	N/A

Environmental, Social and Governance Reporting Guide		Page Number	Report Content	
Aspect A3: The Environment and Natural Resources				
A3	General Disclosure	34-49	5	Green Development Driven by Innovation
A3.1	Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	34-49	5	Green Development Driven by Innovation
Subject Area B: Social				
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B1	General Disclosure	64-65	7.1	Protecting Employees' Rights and Interests
Aspect B2: Health and Safety				
B2	General Disclosure	52-61	6	Fully Solidifying the Defence for Safe Production
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B2.3	Description of occupational health and safety measures adopted, how they are implemented and monitored.	56-58 59 66-67	6.3 6.4 7.3	Implementing Safety Measures Safeguarding Occupational Health Caring Physical and Mental Health
Aspect B3: Development and Training				
B3	General Disclosure	60 65-66	6.5 7.2	Improving Safety Awareness Promoting Talent Development
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B4	General Disclosure	64-65	7.1	Protecting Employees' Rights and Interests
Operating Practices				
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B5	General Disclosure	70-72	8.1	Deepening Supply Cooperation
B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored.	70-72	8.1	Deepening Supply Cooperation

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Environmental, Social and Governance Reporting Guide		Page Number	Report Content	
Aspect B6: Product Responsibility				
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B6.2	Number of products and service-related complaints received and how they are dealt with.	72	8.2	Providing Quality Service
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B6.4	Description of quality assurance process and recall procedures.	–	N/A	
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B7.2	Description of preventive measures and whistle-blowing procedures, how they are implemented and monitored.	28-30	4.2.2	Anti-corruption
Community				
Aspect B8: Community Investment				
B8	General Disclosure	72-75 83	8.3 9	Fulfilling Social Responsibilities Dedicating in Building an International Brand
B8.1	Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport).	72-75 83	8.3 9	Fulfilling Social Responsibilities Dedicating in Building an International Brand
B8.2	Resources contributed (e.g. money or time) to the focus area.	72-75	8.3	Fulfilling Social Responsibilities

11.3 Contents Index of GRI Sustainability Reporting Standards (GRI Standards) of Global Reporting Initiative

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GRI 102: General Disclosures 2016			
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GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
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102-43	Approach to stakeholder engagement	13	2.7.1 Information about and Communication with Stakeholder
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102-46	Defining report content and topic boundaries	87	11.1 About this Report
102-47	List of material topics	14-15	2.7.2 Process of Identification of Material Issues
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102-49	Changes in reporting	–	No major changes
102-50	Reporting period	87	11.1 About this Report
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102-52	Reporting cycle	87	11.1 About this Report
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103-1	Explanation of the material topic and its boundary	14-15 34-49	2.7.2 Process of Identification of Material Issues 5 Green Development Driven by Innovation
103-2	The management approach and its component	34-35 35-37	5.1 Developing Clean Energy 5.2 Enhancing Innovation Capability
103-3	Evaluation of the management approach	34-35 35-37	5.1 Developing Clean Energy 5.2 Enhancing Innovation Capability
GRI 302: Energy 2016			
302-1	Energy consumption within the organisation	37-39	5.3.2 Energy Consumption Management
302-3	Energy intensity	37-39 24-27	5.3.2 Energy Consumption Management 4.1 Ensuring Power Supply
Water Resources and Sewage			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	14-15 40-41	2.7.2 Process of Identification of Material Issues 5.3.3 Water Resources Management
103-2	The management approach and its component	40-41	5.3.3 Water Resources Management
103-3	Evaluation of the management approach	40-41	5.3.3 Water Resources Management
GRI 303: Water Resources and Sewage 2018			
303-2	Management of impacts related to discharge	46	5.3.4.3 Wastewater Management
303-3	Water withdrawal by source	40-41	5.3.3 Water Resources Management
303-4	Water withdrawal by destination	46	5.3.4.3 Wastewater Management

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
Emissions (Material Issues: Reduction of Carbon Dioxide Emission and Emission of Control Components)			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	14-15 41-49	2.7.2 Process of Identification of Material Issues 5.3.4 Emissions Management
103-2	The management approach and its component	41-49	5.3.4 Emissions Management
103-3	Evaluation of the management approach	41-49	5.3.4 Emissions Management
GRI 305: Emissions 2016			
305-1	Direct (Scope 1) Green house gas (GHG) emissions	43-45	5.3.4.2 Management of Greenhouse Gases
305-2	Energy indirect (Scope 2) GHG emissions	43-45	5.3.4.2 Management of Greenhouse Gases
305-4	GHG emissions intensity	43-45	5.3.4.2 Management of Greenhouse Gases
305-7	Nitrogen oxides (NOx), sulphur oxides (SOx), and other significant air emissions	41-43	5.3.4.1 Exhaust Gas Management
Effluents and Waste			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	14-15 46 47-49	2.7.2 Process of Identification of Material Issues 5.3.4.3 Wastewater Management 5.3.4.4 Waste Management
103-2	The management approach and its component	46 47-49	5.3.4.3 Wastewater Management 5.3.4.4 Waste Management
103-3	Evaluation of the management approach	46 47-49	5.3.4.3 Wastewater Management 5.3.4.4 Waste Management

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
GRI 306: Effluents and Waste 2016			
306-1	Water discharge by quality and destination	46	5.3.4.3 Wastewater Management
306-2	Waste by type and disposal method	47-49	5.3.4.4 Waste Management
Environmental Compliance (Material Issues: Energy Use, Emission of Control Components and Reduction of Carbon Dioxide Emission)			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	14-15 37-49	2.7.2 Process of Identification of Material Issues 5.3 Promoting energy saving and emission reduction
103-2	The management approach and its component	37-49	5.3 Promoting energy saving and emission reduction
103-3	Evaluation of the management approach	37-49	5.3 Promoting energy saving and emission reduction
GRI 307: Environmental Compliance 2016			
307-1	Non-compliance with environmental laws and regulations	37-49	5.3 Promoting energy saving and emission reduction
Supplier Environmental Assessment			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	14-15 70-72	2.7.2 Process of Identification of Material Issues 8.1 Deepening Supply Cooperation
103-2	The management approach and its component	70-72	8.1 Deepening Supply Cooperation
103-3	Evaluation of the management approach	70-72	8.1 Deepening Supply Cooperation
GRI 308: Supplier Environmental Assessment 2016			
308-2	Negative environmental impacts in the supply chain and actions taken	70-72	8.1 Deepening Supply Cooperation
GRI 400 Social			

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks	
Occupational Health and Safety (Material Issue: Safe Production and Occupational Health)				
GRI 103: Management Approach 2016				
103-1	Explanation of the material topic and its boundary	14-15	2.7.2	Process of Identification of Material Issues
		59	6.4	Safeguarding Occupational Health
		60	6.5	Improving Safety Awareness
		60-61	6.6	Enhancing Outsourcing Management
103-2	The management approach and its component	59	6.4	Safeguarding Occupational Health
		60	6.5	Improving Safety Awareness
		60-61	6.6	Enhancing Outsourcing Management
103-3	Evaluation of the management approach	59	6.4	Safeguarding Occupational Health
		60	6.5	Improving Safety Awareness
		60-61	6.6	Enhancing Outsourcing Management
GRI 403: Occupational Health and Safety 2018				
403-2	Hazard identification, risk assessment and incident investigation	59	6.4	Safeguarding Occupational Health
403-7	Prevention and mitigation of occupational health and safety impacts directly related to business relationship	59	6.4	Safeguarding Occupational Health
403-9	Occupational injury	10-12	2.6	Table of Key Performance Indicators in 2020
Training and Education (Material Issue: Staff Training and Development)				
GRI 103: Management Approach 2016				
103-1	Explanation of the material topic and its boundary	14-15	2.7.2	Process of Identification of Material Issues
		65-66	7.2	Promoting Talent Development
103-2	The management approach and its component	65-66	7.2	Promoting Talent Development
103-3	Evaluation of the management approach	65-66	7.2	Promoting Talent Development
GRI 404: Training and Education 2016				
404-2	Programs for upgrading employee skills and transition assistance programs	65-66	7.2	Promoting Talent Development

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks	
Child Labour				
GRI 103: Management Approach 2016				
103-1	Explanation of the material topic and its boundary	14-15	2.7.2	Process of Identification of Material Issues
		64-65	7.1	Protecting Employees' Rights and Interests
103-2	The management approach and its component	64-65	7.1	Protecting Employees' Rights and Interests
103-3	Evaluation of the management approach	64-65	7.1	Protecting Employees' Rights and Interests
GRI 408: Child Labour 2016				
408-1	Operations and suppliers at significant risk for incidents of child labour	64-65	7.1	Protecting Employees' Rights and Interests
Forced or Compulsory Labour				
GRI 103: Management Approach 2016				
103-1	Explanation of the material topic and its boundary	64-65	7.1	Protecting Employees' Rights and Interests
103-2	The management approach and its component	64-65	7.1	Protecting Employees' Rights and Interests
103-3	Evaluation of the management approach	64-65	7.1	Protecting Employees' Rights and Interests
GRI 409: Forced or Compulsory Labour 2016				
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labour	64-65	7.1	Protecting Employees' Rights and Interests
		70-72	8.1	Deepening Supply Cooperation
Supplier Social Assessment				
GRI 103: Management Approach 2016				
103-1	Explanation of the material topic and its boundary	14-15	2.7.2	Process of Identification of Material Issues
		70-72	8.1	Deepening Supply Cooperation
103-2	The management approach and its component	70-72	8.1	Deepening Supply Cooperation
103-3	Evaluation of the management approach	70-72	8.1	Deepening Supply Cooperation
GRI 414: Supplier Environmental Assessment 2016				
414-2	Negative social impacts in the supply chain and actions taken	70-72	8.1	Deepening Supply Cooperation

11.4 Readers' Feedback

Dear readers:

Hello! Thank you for reading this report. We particularly wish to listen to your comments and suggestions, and your comments and suggestions are the driving force behind our continuous improvement of our report.

Please help to complete the relevant questions raised in the feedback form and mail it to the headquarters of the Company (headquarters address: Huaneng Building, Fuxingmennei Street 6, Xicheng District, Beijing).

1. Your overall assessment of the Company's "Environmental, Social and Governance Report" is:
   ○ good ○ fair ○ poor

2. Do you think this report reflects the Company's significant impacts on the environmental, social and governance?
   ○ good ○ fair ○ poor

3. What do you think of the information, and the accuracy and completeness of the indicator data disclosed in this report?
   ○ good ○ fair ○ poor

4. What do you think of the Company in serving its customers and protecting the interests of its stakeholders?
   ○ good ○ fair ○ poor

5. Which part of the report do you concern the most?

   _____

6. Is there any content that you are looking for but not found in this report? If yes, please write down what you are concerned about.

   _____

If you wish, you are welcome to provide personal information to facilitate further communication with you:

Name	Occupation:
Organisation:	Contact Address:
Postal Code:	Tel:
Fax:	E-mail:


華能國際電力股份有限公司
Huaneng Power International, Inc.