POWERING A BRIGHTER TOMORROW

ANNUAL REPORT 2021

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

STOCK CODE : 902

INNOVATION

FOR A BRIGHTER FUTURE







Guided by the "carbon peak and carbon neutral" targets,
Intensify the transformation and upgrading of coal power,
Accelerate the pace of development of new energy projects,
Optimize the green development path.

As a power company, devoted to providing sufficient, reliable and eco-friendly energy to the community; as a listed company, devoted to creating long-term, stable and increasing returns for shareholders; and as a first class power producer, devoted to having excellency in operation, becoming a leading power enterprise in China and an advanced enterprise internationally.





CONTENTS

4 Company Profile

8 Major Corporate Events in 2021

10 Financial Highlights

12 Letter to Shareholders

16 Management's Discussion and Analysis

39 Corporate Governance Report

54 Social Responsibility Report

61 Investor Relations
65 Report of the Board of Directors
89 Report of the Supervisory Committee
93 Profiles of Directors, Supervisors and Senior Management
102 Corporate Information
104 Glossary
105 Independent Auditor's Report
112 Consolidated Statement of Comprehensive Income
115 Consolidated Statement of Financial Position
118 Consolidated Statement of Changes in Equity
122 Consolidated Statement of Cash Flows
125 Notes to the Financial Statements
310 Reconciliation of Financial Statements between PRC GAAP and IFRS

COMPANY PROFILE

Huaneng Power International, Inc. (the "Company" or "Huaneng Power") and its subsidiaries are mainly engaged in developing, constructing, operating and managing large-scale power plants throughout China. The Company is one of the China's largest listed power generation comanies, and is the first power generation company in China to list in New York, Hong Kong and Shanghai simultaneously. As at 31 December 2021, the Company has controlled installed capacity of 118,695 MW, equity-based installed capacity of 103,875 MW and the proportion of low carbon, clean energy installation reaching 22.39%. 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 was incorporated on 30 June 1994. It completed its initial global public offering of 1,250,000,000 overseas listed foreign shares ("foreign shares") in October 1994, which were listed on the New York Stock Exchange (Stock Code: HNP) in the United States by issuing 31,250,000 American Depository Shares ("ADS"). In January 1998, the foreign shares of the Company were listed on The Stock Exchange of Hong Kong Limited (the "Hong Kong Stock Exchange") by way of introduction (Stock Code: 902). Subsequently, in March 1998, the Company successfully completed a global placing of 250,000,000 foreign shares along with a private placing of 400,000,000 domestic shares. In November 2001, the Company successfully completed the issue of 350,000,000 A Shares (Stock Code: 600011) in the People's Republic of China ("China", "PRC"), of which 250,000,000 domestic public shares were listed on the Shanghai Stock Exchange. In December 2010, the Company completed the non-public issuance of 1,500,000,000 A Shares and 500,000,000 H Shares. In November 2014, the Company completed the non-public issuance of 365,000,000 H Shares. In November 2015, the Company completed the non-public issuance of 780,000,000 H Shares. In October 2018, the Company completed the non- public issuance of 498 million A shares. Currently, the total share capital of the Company amounts to approximately 15.7 billion shares.

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. As a power generation enterprise, the Company has been insisting on innovations in technologies, structure, and management since its incorporation. 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. The Company was the first to introduce a 600 MW supercritical generating unit into China and we also started operating the first domestically built single 1,000 MW ultra-supercritical coal-fired generating unit, and the first digitalized 1,000 MW ultra-supercritical coal-fired generating unit in China. The Company completed the construction of the first 1,000 MW generating unit in the world using sea water desulphurization

facilities and the construction of the first double reheat ultra-supercritical coal-fired generating unit, and developed the technology for synergistic treatment of flue gas of coal-fired power plants, which was widely applied in environmental protection renovation and newly-constructed projects. The Company's self-developed safe and intelligent DCS/DEH integrated distributed control system, the first set of major technical equipment completely produced in China, was put into operation in a 1,000 MW ultra-supercritical high-efficiency double reheat generating unit, and widely applied in coal-fired generating units and gas turbine. The Company was the first to realise mass production of wind turbine of 5 MW in China, and invested and operated the most advanced gas turbine with the largest generation capacity and heat supplying capacity in China. The Company also completed the first major energy project in the China-Pakistan Economic Corridor, creating China's best overseas power construction project in terms of safety, quality and speed. The technical and economic indicators as well as the overall manpower efficiency of the Company have been remaining at the forefront in China's power industry. The Company constantly optimizes the power structure and regional distribution, and accelerates development of new energy while consolidating its leading position in conventional energy, aiming to enhance industrial synergy effect. Furthermore, it has expanded the service range for power distribution and sales to achieve an overall improvement in operation, quality and corporate vigour.



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 positive transformation to low carbon, clean energy, advantages in scientific and technological innovation and environmental protection, 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 well as strong support from major shareholders.

The objectives of the Company are: as a power company, devoted to providing sufficient, reliable and eco-friendly energy to the community; as a listed company, devoted to creating long-term, stable and increasing returns for shareholders; and as a first-class power producer, devoted to having excellency in operation, becoming a leading power enterprise in China and an advanced enterprise in the international market.

The Company's parent company and ultimate controlling shareholder is Huaneng International Power Development Corporation ("HIPDC") and China Huaneng Group Co., Ltd. ("Huaneng Group"), respectively.

DISTRIBUTION OF POWER PLANTS OF THE COMPANY

The controlled installed capacity of the Company as at 31 December 2021 was 118,695 MW, distributed in areas as depicted in the chart (Unit: MW)

CHINA NETWORK

Heilongjiang 3,896	Jilin 3,150	Liaoning 5,138	Inner Mongolia 273	Hebei 3,027	Gansu 3,897
Ningxia 20	Beijing 2,766	Tianjin 1,675	Shanxi 3,732	Shandong 21,670	Henan 8,080
Jiangsu 11,448	Shanghai 5,012	Chongqing 3,735	Zhejiang 6,251	Hubei 3,973	Hunan 2,954





Jiangxi
6,748

Anhui
1,614

Fujian
4,053

Guangdong
6,306

Guangxi
321

Yunnan
3,800

Guizhou
745

Hainan
2,403

OVERSEAS NETWORK

Singapore
2,009

Total
118,695

LEGENDS

Wind-power | PV Power | Coal-fired | Combined Cycle | Hydro-power | Biomass power

MAJOR CORPORATE EVENTS IN 2021

JAN – MAR



- The Company announced that power generation within China for the whole year of 2020 recorded an increase of 3.78% year-on-year.

- The Company announced that electricity sold within China for the first quarter of 2021 recorded a year-on-year increase of 30.20%.
- The Company announced its results for the first quarter of 2021. According to the PRC GAAPs, the net profit attributable to shareholders of the Company was RMB3,127 million, representing a year-on-year increase of 51.75%.
- The Company held global investor telephone conferences for its results for the first quarter in 2021.
- The Operation Department of Huaneng Fujian Luoyuan Power Generation Co., Ltd., a subsidiary of the Company, was awarded the honorary title of "Pioneer of National Workers" by the All-China Federation of Trade Unions.



- Huaneng Heilongjiang Luobei 200MW wind power project, a large wind power project of the Company located the northernmost in China, achieved fully on-grid connection.
- The Company issued the 2021 Corporate Bonds (first tranche) to qualified investors by public offering with principal amount of RMB2 billion, which was divided into two categories with the term of 3 years and 10 years.
- The first sludge coupling power generation project in the Southwest China was built and put into operation in Huaneng Chongqing Luohuang Power Plant. The project is a national pilot project of technological improvement in China, and it can dispose of nearly one-third of domestic sludge in Chongqing every year.
- Huaneng Shandong Jiyang biomass heat and power co-generation project, the first independent biomass project constructed by the Company, was successfully completed and put into operation.
- The Company was awarded as the "Excellent Issuer of Corporate Bonds" by the Shanghai Stock Exchange.
- The Company successfully issued the first batch of carbon neutral bonds in the interbank market in China, with issuing amount of RMB1 billion for a term of 3 year, and the issuing interest rate was 3.45%.

APR – JUN



- The Company announced its annual operating results for 2020. According to the PRC GAAPs, the net profit attributable to shareholders of the Company was RMB4,565 million, representing a year-on-year increase of 191.51%.
- The Company held global investor telephone conferences for its annual results for 2020.
- The Company announced the implementation of the profit distribution plan for the year of 2020 and distributed the cash dividends of RMB0.18 (including tax) for each ordinary share to all shareholders.
- The Company issued the 2021 Corporate Bonds (second tranche) to qualified investors by public offering with principal amount of RMB4 billion, which was divided into two categories with the term of 3 years and 10 years.
- The Company issued the 2021 Corporate Bonds (third tranche) to qualified investors by public offering with principal amount of RMB1.8 billion with the term of 10 years.
- The Company won the "TOP 50 Outstanding Listed Company for the Year" at the 2021 Value List Awards Ceremony organized by Interface News of Shanghai United Media Group.
- The Company held the 2020 Annual General Meeting, and considered and approved nine proposals, including the profit distribution plan of the Company for the year of 2020.

- The Company announced that electricity sold within China for the first half year of 2021 record a year-on-year increase of 20.80%.
- The Company announced its interim results for 2021. According to the PRC GAAPs, the net profit attributable to shareholders of the Company was RMB4,282 million, representing a year-on-year decrease of 25.30%.





- The Company held global investor telephone conferences for its interim results for the year of 2021.

- The key technology of "new type of high alkali coal liquid slag boiler", a national key R&D project undertaken by the Company, successfully passed the 168-hour trial operation at Unit 5 of Tianjin Huaneng Yangliuqing Thermal Power Plant.



JUL – SEP



- The Company announced that electricity sold within China for the first three quarters of 2021 recorded an increase of 17.11% year-on-year.
- The Company announced its results for the first three quarters of 2021. According to the PRC GAAPs, the net profit attributable to shareholders of the Company was RMB783 million, representing a year-on-year decrease of 91.42%.
- The Company held global investor telephone conferences for its results for the third quarter of 2021.
- The Company successfully issued the first batch of energy supply bonds in the national interbank market in China, with an issue size of RMB5 billion and a term of 99 days, and the final issue interest rate of 2.38%, which is the largest size and the most favorable interest rate of the same term among the same batch.



- The Company held the 2021 First Extraordinary General Meeting and considered and passed the Proposal on the Company's new added connected transactions with Huaneng Group in 2021.
- The controlled installed capacity of the Company's newly commissioned thermal power units, wind turbine generating units, solar power units and biomass units was 2,000 MW, 2,403.45 MW, 799 MW, and 30 MW respectively in 2021, and the proportion of low carbon, clean energy installation reached 22.39%.
- Huaneng Fujian Luoyuan Power Plant Phase I Project – a green construction demonstration project integrating electricity storage and transmission at Luoyuan Port won the Gold Award of National Quality Engineering.
- The first offshore wind power project in Shandong Province – Huaneng Shandong Peninsula South No. 4 Offshore Wind Power Project, invested and constructed by the Company, was connected to the grid with all 58 wind turbines.

OCT – DEC

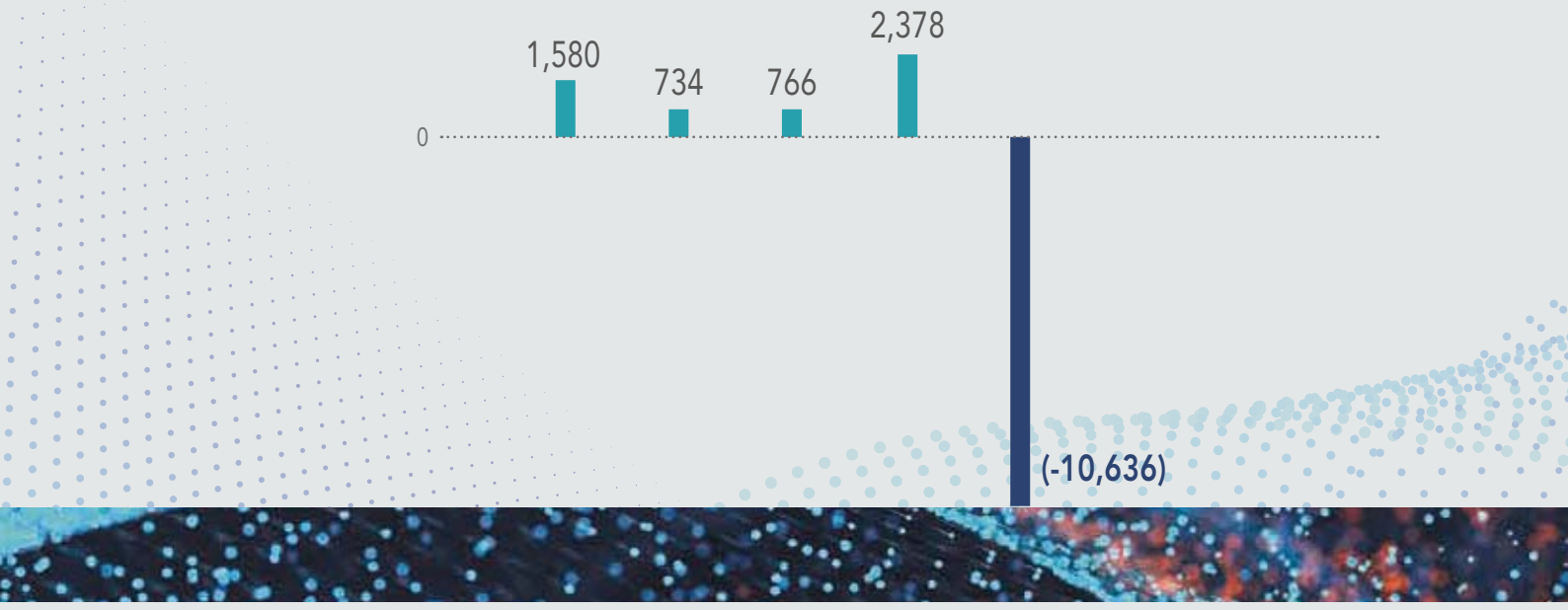
- Huaneng Jiangxi Ruijin Power Plant Phase II Project was fully completed and put into operation. This project is the first large-scale smart power plant in China that adopts national production control and information system (DCS/DEH+SIS).
- Huaneng Zhejiang Qinggang PV Power Station, China's first full intertidal fishery and light complementary ecological photovoltaic power station invested and constructed by the Company, was connected to the grid at full capacity.
- The "key technology of new type of high alkali coal liquid slag boiler", a national key R&D project led and undertaken by the Company, successfully passed the acceptance of the Ministry of Science and Technology.
- Huaneng Dalian Zhuanghe Offshore Wind Power Project, the largest single offshore wind power project in northern China with the highest latitude invested and constructed by the Company, was connected to the grid and generated electricity at full capacity.
- The world's largest floating PV power station with the largest single capacity invested and constructed by the Company – Huaneng Shandong Dezhou Dingzhuang 320MW water PV power station, was connected to the grid.
- The Company won the 11th China Securities Golden Bauhinia Award for the "Best Listed Company" organized by Hong Kong Ta Kung Wen Wei Media Group.
- The Company held the second extraordinary general meeting in 2021 and considered and approved four proposals, including the Proposal of Daily Connected Transactions between the Company and Huaneng Group in 2022.

FINANCIAL HIGHLIGHTS

(Amounts expressed in thousands of RMB, except per share data)

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Note 4)

	Year ended 31 December				
	2017	2018	2019	2020	**2021**
OPERATING REVENUE	152,459,444	169,550,624	174,009,401	169,446,338	**204,605,083**
Profit/(Loss) Before Income Tax Expense	2,801,733	1,973,147	3,119,460	4,773,736	**(15,120,644)**
Income Tax Expense	(1,217,526)	(643,173)	(2,011,255)	(2,163,173)	**1,929,755**
Profit/(Loss) After Income Tax Expense	1,584,207	1,329,974	1,108,205	2,610,563	**(13,190,889)**
Attributable To:					
– Equity Holders of the Company	1,579,836	734,435	766,345	2,377,851	**(10,636,194)**
– Non-Controlling Interests	4,371	595,539	341,860	232,712	**(2,554,695)**
Basic Earnings/(Losses) Per Share (RMB/Share)	0.10	0.03	0.01	0.04	**(0.81)**
Diluted Earnings/(Losses) Per Share (RMB/Share)	0.10	0.03	0.01	0.04	**(0.81)**



PROFIT/(LOSS) ATTRIBUTABLE TO EQUITY HOLDERS OF THE COMPANY UNDER IFRS (RMB Million)

For the years ended 31 December

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION (Note 5)

	As at 31 December				
	2017	2018	2019	2020	**2021**
Total assets	396,589,511	419,903,311	428,250,063	449,904,658	**500,771,223**
Total liabilities	288,974,907	303,781,641	297,871,017	298,288,460	**367,213,210**
Net assets	107,614,604	116,121,670	130,379,046	151,616,198	**133,558,013**
Equity holders of the Company	87,641,566	94,435,418	108,803,735	129,845,923	**113,047,814**
Non-controlling interests	19,973,038	21,686,252	21,575,311	21,770,275	**20,510,199**

Notes:

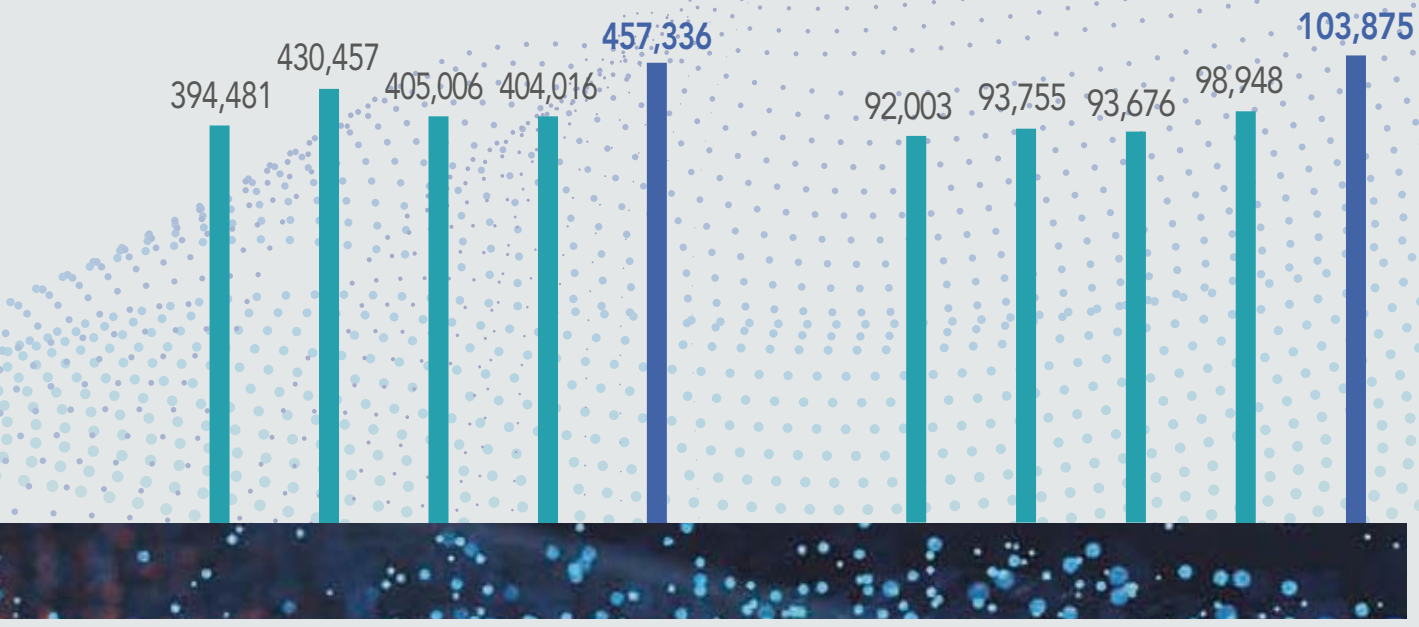
1. As a result of the adoption of IFRS 15, Revenue from contracts with customers, with effect from 1 January 2018, the Company and its subsidiaries have changed its accounting policies in respect of revenue recognition. In accordance with the transitional provisions of the standard, the changes in accounting policies were adopted by way of opening balance adjustments to equity as at 1 January 2018. Figures in years earlier than 2018 are stated in accordance with the policies applicable in those years.

2. The Company and its subsidiaries adopted IFRS 9, Financial instruments, from 1 January 2018. As a result, the Company and its subsidiaries have changed its accounting policies in relation to financial instruments. Differences in the carrying amounts of the financial assets resulting from the adoption of IFRS 9 were recognised in opening reserves at 1 January 2018. There was no difference in the carrying amounts of the financial liabilities. Prior to 2018, figures were stated in accordance with the policies applicable in those years.

3. The Company and its subsidiaries have adopted IFRS 16 Leases with the date of initial application of 1 January 2019. The standard is applied retrospectively with the cumulative effect of initial adoption as an adjustment to the opening balance of retained earnings at 1 January 2019, and the comparative information for prior years was not restated.

4. The results for the years ended 31 December 2017, 2018 and 2019 are derived from the historical financial statements of the Company. The results for the years ended 31 December 2020 and 2021 are set out on pages 112 to 114. All such information is extracted from the financial statements prepared under International Financial Reporting Standards ("IFRS").

5. The consolidated statements of financial position as at 31 December 2017, 2018 and 2019 are derived from the historical financial statements of the Company. The consolidated statements of financial position as at 31 December 2020 and 2021 are set out on pages 115 to 117. All such information is extracted from the financial statements prepared under IFRS.



DOMESTIC POWER GENERATION (Million KWH)

For the years ended 31 December

AN EQUITY-BASED INSTALLED CAPACITY (MW)

As at 31 December

LETTER TO SHAREHOLDERS



ZHAO KEYU
Chairman

ENERGY FOR BRIGHTER TOMORROW

The development objectives of Huaneng Power are:

as a power company, devoted to providing sufficient, reliable and eco-friendly energy to the community; as a listed company, devoted to creating long-term, stable and increasing returns for shareholders; and as a first- class power producer, devoted to having excellency in operation, becoming a leading power enterprise in China and an advanced enterprise in the international market.



DEAR SHAREHOLDERS,

In 2021, in the face of the risk of the COVID-19 epidemic and the market environment of significant price increase in the coal market, the Company made all-out efforts to coordinate the work of epidemic prevention and control, production and operation, and transformation and development, thus the safety production and supply of electric power and thermal power maintained stable, the pace of transformation and upgrading accelerated, and innovation made a new progress. We completed the major objectives of the year and continued to fulfill the responsibility of providing sufficient, reliable and eco-friendly energy to the community. In 2021, the Company achieved consolidated operating revenue of RMB204,605 million, representing a year-on-year increase of 20.75%, and net loss attributable to the equity holders of the Company of RMB10,636 million, representing a year-on-year decrease of 547.27%.

In 2021, the Company was awarded "Excellent Issuer of Corporate Bonds", "A" grade rating for annual information disclosure granted by the Shanghai Stock Exchange, the Golden Bauhinia Award for the "Best Listed Company" by China Securities, and "Top 50 Outstanding Listed Company for the Year" by Interface News. The Company was also selected as one of the "Top 500 Chinese Enterprises in Philanthropy in 2021".

The Company has been paying dividends to shareholders every year since 1998. The declared dividend accumulated to RMB62.687

LETTER TO SHAREHOLDERS

billion. According to the Articles of Association, the net profit attributable to shareholders of the Company in 2021 was negative, the Board recommended not to declare dividend for 2021 after taking into account the investment requirement for the transformation development of the Company, the rise of the gearing ratio of the Company in 2021 and other factors. Such proposal which has been considered and passed by the Board meeting and the Supervisory Committee will be submitted to the annual general meeting of the Company for consideration.

In 2021, in the face of the difficult situation of sharp increase in coal market price, tight supply and demand of coal and shortage of electricity supply in some regions, the Company actively fulfilled its social responsibility to ensure the safety of supply and effectively guaranteed the safety of energy consumption in the areas under its jurisdiction.

The Company made every effort to improve the quality and performance of its operations. Facing the unfavorable situation of high coal price, the Company tracked the trend of coal market in real time, made full use of policy support, actively seized market opportunities, and optimized procurement strategy and regional supply structure, striving to control coal procurement cost. At the same time, the Company took advantage of the policy opportunity of expanding the floating range of tariff to optimize the marketing strategy in time, and achieved a double increase in the quantity and price of electricity and heat supply.

The Company scientifically planned and formulated the "14th Five-Year" Development Strategy, actively implemented the carbon peak action plan, adhered to the path of green, low-carbon, clean and efficient development, seized the development of new





energy resources, accelerated the optimization and adjustment of coal power structure, and further accelerated the pace of low-carbon transformation and upgrading. By the end of 2021, the proportion of installed low-carbon and clean energy capacity of the Company increased to 22.39%.

The Company insisted on science and technology innovation as the first driving force and made breakthroughs in major science and technology projects. China's first fully domestic DCS/DEH + SIS integrated 1,000 MW ultra-supercritical high-efficiency double reheat project was completed and put into operation at Huaneng Jiangxi Ruijin Power Plant, a subsidiary of the Company, and the National Key Research and Development Program project "high alkali coal liquid slag boiler technology" passed the acceptance of the Ministry of Science and Technology.

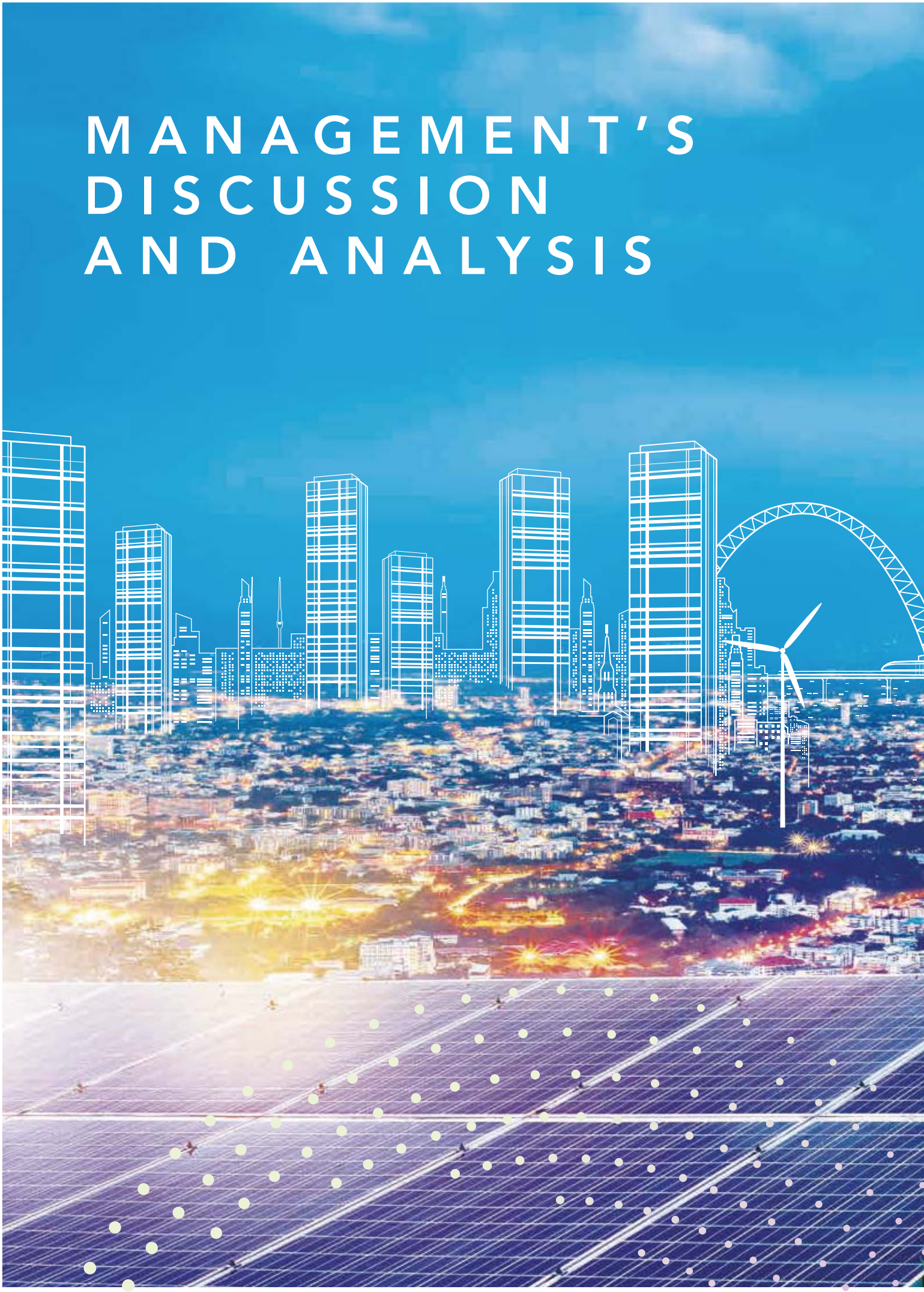
Looking ahead to 2022, the Company will continue to implement the four strategies of green development, innovation development, safety development and excellent operation, focus on improving the "five capabilities" of transformation and development, independent innovation, operation and management, risk prevention and international management, firmly resolve to green and low-carbon development, accelerate the construction of a new pattern of high-quality development, and make greater strides in the journey of creating an international first-class listed power generation company.

Being a responsible enterprise, the Company insists on supporting the continued enhancement of our corporate competitive edges through a responsible approach; insists on duly performing our operational responsibilities to provide our shareholders with long-term, stable and increasing returns; continues to perform our safety responsibilities, to be people-oriented and be focused on safety development for the sake of developing itself into an enterprise with the highest safety standard; continues to perform our environmental responsibilities by paying heed to people's livelihood and concerning clean development to ensure utilization of resources in an efficient and energy-saving manner, thus turning the Company into a "green corporation"; continues to perform our social responsibilities by creating mutual benefits and win-win scenarios that are conducive to the harmonious development of the Company and its stakeholders, so that the Company may serve as an excellent corporate citizen.

ZHAO KEYU
Chairman

Beijing, the PRC
22 March 2022

MANAGEMENT'S DISCUSSION AND ANALYSIS



The principal activities of the Company are construction, operation and management of large power plants within China. As of 31 December 2021, the Company had a controlled installed capacity of 118,695 MW and an equity-based installed capacity of 103,875 MW, of which approximately 22.39% was from clean energy sources (gas turbine, hydro, wind and photovoltaic power generation).



OPERATING AND FINANCIAL REVIEWS AND PROSPECTS

MANAGEMENT'S DISCUSSION AND ANALYSIS

(Prepared under International Financial Reporting Standards ("IFRS"))

GENERAL

The principal activities of the Company are construction, operation and management of large power plants within China. As of 31 December 2021, the Company had a controlled installed capacity of 118,695 MW and an equity-based installed capacity of 103,875 MW, of which approximately 22.39% was from clean energy sources (gas turbine, hydro, wind and photovoltaic power generation). The Company located its power plants in 26 provinces, autonomous region and municipalities within China; the Company also owns a wholly owned power enterprise located in Singapore and invests in a power enterprise located in Pakistan. The Company is among the biggest listed power companies in China.

For the year ended 31 December 2021, the operating revenue of the Company amounted to RMB204,605 million, representing an increase of 20.75% over the same period of last year. The net loss attributable to equity holders of the Company was RMB10.636 billion, representing a decrease of 547.27% over the same period of last year; the losses per share was RMB0.81.

A. OPERATING RESULTS

1. 2021 operating results

The electricity sold by the Company's domestic power plants for the year ended 31 December 2021 is as listed below (in billion kWh):

Region	Electricity Sold			
	2021 10-12	Change	2021 1-12	Change
Coal-fired	**93.873**	0.93%	**378.528**	10.81%
Combined Cycle	**6.493**	3.68%	**26.867**	26.24%
Wind-Power	**5.501**	41.99%	**19.867**	46.78%
PV	**0.863**	44.72%	**3.408**	46.90%
Heilongjiang Province	**2.800**	-20.75%	**12.846**	-2.96%
Coal-fired	**2.301**	-26.82%	**11.389**	-5.00%
Wind-power	**0.468**	30.87%	**1.327**	18.83%
PV	**0.032**	0.26%	**0.130**	-2.15%
Jilin Province	**2.258**	-9.03%	**8.805**	-15.21%
Coal-fired	**1.776**	-12.41%	**7.013**	-21.03%
Wind-power	**0.320**	-5.03%	**1.145**	5.66%
Hydro-power	**0.016**	-17.21%	**0.070**	-6.60%
PV	**0.059**	11.08%	**0.246**	72.08%
Biomass power	**0.087**	92.53%	**0.331**	63.89%

Region	Electricity Sold			
	2021 10-12	Change	2021 1-12	Change
Liaoning Province	**3.644**	-25.24%	**18.370**	5.24%
Coal-fired	**3.486**	-85.10%	**17.777**	5.30%
Wind-power	**0.116**	21.54%	**0.415**	11.38%
Hydro-power	**0.008**	235.49%	**0.029**	-28.41%
PV	**0.034**	-9.80%	**0.148**	-6.80%
Inner Mongolia	**0.198**	221.45%	**0.553**	165.66%
Wind-power	**0.198**	221.45%	**0.553**	165.66%
Hebei Province	**2.584**	-20.42%	**10.608**	-6.64%
Coal-fired	**2.322**	-25.20%	**9.976**	-8.16%
Wind-power	**0.189**	43.28%	**0.511**	14.58%
PV	**0.074**	520.40%	**0.122**	120.78%
Gansu Province	**3.858**	13.23%	**14.382**	15.09%
Coal-fired	**3.238**	10.11%	**11.912**	16.79%
Wind-power	**0.620**	32.91%	**2.470**	7.53%
Ningxia	**0.003**	-0.36%	**0.022**	-4.02%
PV	**0.003**	-0.36%	**0.022**	-4.02%
Beijing	**2.018**	-14.18%	**8.484**	3.25%
Coal-fired	**0.647**	163.70%	**1.294**	48.71%
Combined Cycle	**1.371**	-34.90%	**7.190**	-2.14%
Tianjin	**1.793**	-9.15%	**6.509**	2.70%
Coal-fired	**1.242**	-13.04%	**4.941**	4.23%
Combined Cycle	**0.549**	1.21%	**1.554**	-1.78%
PV	**0.002**	-28.17%	**0.013**	-8.14%
Shanxi Province	**2.538**	-18.11%	**9.491**	-6.33%
Coal-fired	**1.381**	-31.77%	**6.319**	-15.31%
Combined Cycle	**0.810**	-11.57%	**1.997**	-5.70%
Wind-power	**0.148**	2,392.69%	**0.340**	5,630.21%
PV	**0.199**	29.78%	**0.836**	52.53%
Shandong Province	**22.031**	-1.03%	**81.879**	7.41%
Coal-fired	**21.406**	-2.24%	**79.687**	6.30%
Wind-power	**0.419**	58.15%	**1.393**	83.29%
PV	**0.120**	18.27%	**0.520**	3.29%
Biomass power	**0.087**	N/A	**0.278**	N/A
Henan Province	**4.985**	-4.30%	**21.704**	8.79%
Coal-fired	**4.131**	-13.54%	**18.039**	-1.36%
Combined Cycle	**0.008**	-75.53%	**0.218**	-63.30%
Wind-power	**0.841**	113.48%	**3.423**	227.37%
PV	**0.006**	31.92%	**0.024**	5.78%
Jiangsu Province	**10.936**	20.60%	**42.717**	19.96%
Coal-fired	**8.313**	13.44%	**32.335**	11.33%
Combined Cycle	**1.503**	64.50%	**6.109**	55.94%
Wind-power	**1.059**	36.43%	**4.010**	61.84%
PV	**0.062**	21.42%	**0.264**	56.05%

MANAGEMENT'S DISCUSSION AND ANALYSIS

Region	Electricity Sold			
	2021 10-12	Change	2021 1-12	Change
Shanghai	**5.135**	10.90%	**20.190**	22.45%
Coal-fired	**4.874**	12.69%	**18.874**	25.53%
Combined Cycle	**0.254**	-14.99%	**1.286**	-10.71%
PV	**0.007**	8.38%	**0.030**	142.29%
Chongqing	**3.531**	41.33%	**13.064**	49.96%
Coal-fired	**2.739**	27.02%	**10.274**	44.20%
Combined Cycle	**0.738**	148.04%	**2.525**	86.96%
Wind-power	**0.054**	21.17%	**0.264**	11.94%
Zhejiang Province	**7.360**	25.40%	**31.649**	31.21%
Coal-fired	**7.160**	26.64%	**30.526**	30.72%
Combined Cycle	**0.159**	-22.87%	**1.039**	45.34%
Wind-power	**0.028**	N/A	**0.028**	N/A
PV	**0.013**	38.69%	**0.055**	4.20%
Hubei Province	**4.428**	7.05%	**16.574**	14.73%
Coal-fired	**4.227**	7.04%	**15.632**	15.19%
Wind-power	**0.177**	36.58%	**0.656**	20.99%
Hydro-power	**0.019**	-64.10%	**0.264**	-15.17%
PV	**0.005**	20.33%	**0.022**	1.81%
Hunan Province	**3.163**	16.37%	**11.717**	22.14%
Coal-fired	**2.946**	15.63%	**10.775**	24.36%
Wind-power	**0.139**	12.10%	**0.620**	7.07%
Hydro-power	**0.068**	76.37%	**0.275**	-10.51%
PV	**0.010**	25.37%	**0.047**	9.50%
Jiangxi Province	**6.022**	-0.52%	**22.313**	7.97%
Coal-fired	**5.689**	-1.80%	**21.025**	7.01%
Wind-power	**0.222**	19.09%	**0.857**	6.38%
PV	**0.111**	49.19%	**0.430**	102.29%
Anhui Province	**1.896**	3.24%	**6.135**	13.14%
Coal-fired	**1.682**	3.35%	**5.196**	6.34%
Wind-power	**0.204**	9.85%	**0.807**	90.08%
Hydro-power	**0.010**	-57.35%	**0.132**	18.05%
Fujian Province	**4.586**	11.63%	**20.116**	22.79%
Coal-fired	**4.583**	11.64%	**20.104**	22.81%
PV	**0.002**	-9.20%	**0.012**	3.51%
Guangdong Province	**6.748**	7.91%	**31.197**	34.84%
Coal-fired	**5.853**	5.86%	**27.128**	25.35%
Combined Cycle	**0.889**	23.82%	**4.044**	174.92%
PV	**0.006**	-1.11%	**0.025**	6.26%
Guangxi Province	**0.203**	-8.28%	**0.747**	9.82%
Combined Cycle	**0.109**	-9.00%	**0.435**	2.06%
Wind-power	**0.093**	-7.44%	**0.313**	22.82%

Region	Electricity Sold			
	2021 10-12	Change	2021 1-12	Change
Yunnan Province	**2.016**	-2.81%	**8.239**	13.60%
Coal-fired	**1.896**	-2.59%	**7.756**	16.32%
Wind-power	**0.116**	-1.06%	**0.455**	-17.19%
Hydro-power	**0.004**	-63.71%	**0.028**	-20.01%
Guizhou Province	**0.143**	145.73%	**0.541**	86.74%
Wind-power	**0.046**	11.71%	**0.185**	-15.18%
PV	**0.098**	460.04%	**0.355**	399.97%
Hainan Province	**2.172**	11.43%	**11.312**	2.26%
Coal-fired	**1.982**	14.98%	**10.554**	0.87%
Combined Cycle	**0.102**	-7.58%	**0.470**	47.11%
Wind-power	**0.046**	-16.16%	**0.094**	-14.89%
Hydro-power	**0.021**	-51.00%	**0.088**	29.71%
PV	**0.020**	18.26%	**0.106**	5.28%
Total	**107.050**	2.95%	**430.165**	13.23%

The increase in the Company's electricity sold was mainly attributable to the following factors: (1) the electricity consumption of the whole society in the year 2021 stayed at a high level, which led to a sharp increase in the power generation on the supply side, among which the power generation by our plants in Chongqing, Guangdong, Zhejiang, Shanghai, Fujian, Hunan, Jiangsu, Gansu and Hubei experienced a significant increase, (2) given the hydro-power generation was lower than expected, coal-fired power generation, which accounted for a substantial portion of the Company's power generation capacity, maintained a high rate increase; meanwhile, the Company's coal-fired power plants operated at high load during the winter peak hours, which further led to the increase of our power generation, and (3) the Company has been making further efforts on promoting green and low carbon operation, and the Company's new energy power generation increased significantly.

For the year ended 31 December 2021, the accumulated power generation of Tuas Power Ltd., the Company's wholly owned subsidiary in Singapore, accounted for a market share of 19.2%, representing a decrease of 2.2 percentage points from the same period last year.

In respect of tariff, the Company's domestic average tariff (inclusive of taxes) for the year ended 31 December 2021 was RMB431.88 per MWh, increased by 4.41% from last year (while average tariff (exclusive of taxes) for the same period increased by 4.41% to RMB382.19 per MWh). Sinosing Power Pte Ltd ("**Sinosing Power**")'s average tariff for 2021 was RMB594.46 per MWh, representing an increase by 12.03% from last year.

In respect of fuel costs, due to the sharp increase in thermal coal prices, the Company's fuel cost per unit of power sold by domestic coal-fired power plants increased by 51.32% to RMB316.36 per MWh from last year.

Influenced by the forgoing factors, for the year ended 31 December 2021, the Company recorded an operating revenue of RMB204.605 billion, representing an increase of 20.75% from RMB169.446 billion of last year, and the operating costs and expenses of RMB210.286 billion, representing an increase of 35.03% from RMB155.734 billion of last year, and the net loss before income tax expense was RMB15.121 billion, representing a decrease of 416.74% from the net profit before income tax of RMB4.774 billion of last year.

MANAGEMENT'S DISCUSSION AND ANALYSIS

2. Comparative Analysis of Operating results

2.1 Operating revenue and tax and levies on operations

Operating revenue mainly consists of revenue from electricity sold. For the year ended 31 December 2021, the consolidated operating revenue of the Company and its subsidiaries amounted to RMB204.605 billion, representing an increase of 20.75% from RMB169.446 billion for the year ended 31 December 2020. The operating revenue from domestic operations of the Company increased by RMB28.679 billion over the same period of last year, while the operating revenue generated from newly acquired entities and newly operated generating units was RMB7.7 billion. The increase of operating revenue from the domestic operations of our existing generating units of RMB20.979 billion was mainly due to the simultaneous increase of our electricity sold within China and domestic average tariff.

The operating revenue from the operations of the Company in Singapore increased by RMB5.368 billion over the same period of last year, representing a 48.94% increase, which was mainly attributed to the increase in the tariff. The operating revenue from the operations of the Company in Pakistan increase by RMB1.112 billion, representing an increase of 26.93% compared to the same period last year, mainly due to the increase in the power generation by 24.92% led by the increase in the domestic electricity demand in Pakistan.

Region/type of power generation	Average tariff rate (VAT inclusive) (RMB/MWh)		
	2021	2020	Change
Heilongjiang Province			
Coal-fired	**381.50**	379.26	0.59%
Wind-power	**453.07**	526.17	-13.89%
PV	**693.91**	710.02	-2.27%
Jilin Province			
Coal-fired	**383.48**	371.86	3.12%
Wind-power	**484.74**	490.30	-1.13%
Hydro-power	**413.29**	412.18	0.27%
PV	**446.55**	587.14	-23.95%
Biomass power	**746.82**	749.99	-0.42%
Liaoning Province			
Coal-fired	**404.26**	391.23	3.33%
Wind-power	**549.54**	539.05	1.95%
Hydro-power	**362.04**	362.04	0.00%
PV	**841.78**	874.25	-3.71%
Inner Mongolia			
Wind-power	**465.05**	454.91	2.23%
Hebei Province			
Coal-fired	**366.77**	361.80	1.37%
Wind-power	**495.71**	495.03	0.14%
PV	**488.52**	723.65	-32.49%
Gansu Province			
Coal-fired	**318.85**	312.40	2.06%
Wind-power	**362.06**	343.69	5.35%

Region/type of power generation	Average tariff rate (VAT inclusive) (RMB/MWh)		
	2021	2020	Change
Ningxia			
PV	**800.00**	800.00	0.00%
Beijing			
Coal-fired	**550.97**	478.58	15.13%
Combined Cycle	**624.87**	620.27	0.74%
Tianjin			
Coal-fired	**370.40**	365.79	1.26%
Combined Cycle	**604.19**	597.85	1.06%
PV	**645.51**	634.61	1.72%
Shanxi Province			
Coal-fired	**344.43**	314.39	9.56%
Combined Cycle	**558.72**	612.51	-8.78%
Wind-power	**521.25**	600.00	-13.12%
PV	**538.39**	628.78	-14.38%
Shandong Province			
Coal-fired	**414.22**	408.18	1.48%
Wind-power	**599.15**	598.67	0.08%
PV	**827.67**	850.98	-2.74%
Biomass power	**700.14**	N/A	N/A
Henan Province			
Coal-fired	**389.03**	360.81	7.82%
Combined Cycle	**1,909.57**	960.30	98.85%
Wind-power	**578.98**	585.94	-1.19%
PV	**357.90**	361.70	-1.05%
Jiangsu Province			
Coal-fired	**423.84**	395.57	7.15%
Combined Cycle	**636.93**	632.45	0.71%
Wind-power	**792.78**	757.19	4.70%
PV	**620.08**	734.74	-15.61%
Shanghai			
Coal-fired	**425.80**	406.49	4.75%
Combined Cycle	**897.46**	871.34	3.00%
PV	**819.95**	521.50	57.23%
Chongqing			
Coal-fired	**417.92**	406.68	2.76%
Combined Cycle	**587.99**	724.30	-18.82%
Wind-power	**607.68**	607.05	0.10%
Zhejiang Province			
Coal-fired	**420.71**	406.53	3.49%
Combined Cycle	**679.45**	828.89	-18.03%
Wind-power	**850.00**	N/A	N/A
PV	**1,061.46**	1,121.06	-5.32%

MANAGEMENT'S DISCUSSION AND ANALYSIS

Region/type of power generation	Average tariff rate (VAT inclusive) (RMB/MWh)		
	2021	2020	Change
Hubei Province			
Coal-fired	**420.49**	408.17	3.02%
Wind-power	**605.75**	610.02	-0.70%
Hydro-power	**378.66**	375.18	0.93%
PV	**880.18**	880.00	0.02%
Hunan Province			
Coal-fired	**463.82**	447.29	3.70%
Wind-power	**561.27**	558.50	0.50%
Hydro-power	**327.67**	332.02	-1.31%
PV	**800.46**	837.84	-4.46%
Jiangxi Province			
Coal-fired	**429.88**	410.66	4.68%
Wind-power	**597.15**	604.41	-1.20%
PV	**667.39**	736.44	-9.38%
Anhui Province			
Coal-fired	**384.63**	361.38	6.43%
Wind-power	**590.88**	602.33	-1.90%
Hydro-power	**421.59**	421.63	-0.01%
Fujian Province			
Coal-fired	**401.48**	395.20	1.59%
PV	**978.64**	980.00	-0.14%
Guangdong Province			
Coal-fired	**426.68**	408.00	4.58%
Combined Cycle	**600.62**	568.04	5.74%
PV	**980.00**	980.00	0.00%
Guangxi Province			
Combined Cycle	**721.49**	718.25	0.45%
Wind-power	**562.11**	591.98	-5.05%
Yunnan Province			
Coal-fired	**364.97**	350.97	3.99%
Wind-power	**481.82**	472.26	2.02%
Hydro-power	**246.00**	246.00	0.00%
Guizhou Province			
Wind-power	**598.33**	586.98	1.93%
PV	**454.26**	512.54	-11.37%
Hainan Province			
Coal-fired	**445.89**	441.75	0.94%
Combined Cycle	**523.57**	580.13	-9.75%
Wind-power	**603.00**	604.58	-0.26%
Hydro-power	**387.86**	382.76	1.33%
PV	**897.93**	908.98	-1.22%
Domestic total	**431.88**	413.63	4.41%
SinoSing Power	**594.46**	530.61	12.03%

Tax and levies on operations mainly consist of surcharges of value-added tax. According to relevant administrative regulations, these surcharges include City Construction Tax and Education Surcharges calculated at prescribed percentages on the amounts of the value-added tax paid. For the year ended 31 December 2021, the tax and levies on operations of the Company and its subsidiaries were RMB1.686 billion, representing a decrease of RMB108 million from RMB1.794 billion for the same period of last year, of which the tax and levies on operations attributable to newly acquired entities and new generating units accounted for RMB18 million.

2.2 Operating expenses

For the year ended 31 December 2021, the total operating expenses of the Company and its subsidiaries was RMB210.286 billion, representing an increase of 35.03% from the same period last year. The operating expenses in domestic operations of the Company increased by RMB47.988 billion, or 33.72%, from the same period last year, of which the newly acquired entities and the new generating units accounted for RMB4.407 billion; the costs attributable to the existing entities increased by RMB43.581 billion, which was primarily attributable to the increase in the fuel cost led by the sharp increase in thermal coal purchase price.

The operating expenses from the operations in Singapore increased by RMB5.215 billion, or 48.66%, from the same period last year, which was mainly due to the increase in the tariff in Singapore, which in turn increase the operating cost of purchasing electricity. The operating expenses from the operations in Pakistan increased by RMB1.349 billion, which was mainly due to increase in fuel costs led by the increase in coal purchase price.

2.2.1 Fuel costs

Fuel costs account for the majority of the operating expenses for the Company and its subsidiaries. For the year ended 31 December 2021, fuel costs of the Company and its subsidiaries increased by 64.71% to RMB146.539 billion from RMB88.966 billion for the year ended 31 December 2020. The fuel costs from domestic operations of the Company and its subsidiaries increased by RMB57.197 billion, which was primarily attributable to the sharp increase in thermal coal purchase price. The fuel costs of the newly acquired entities and new generating units were RMB2.740 billion and the fuel costs of the existing generating units increased by RMB54.457 billion from same period last year. Fuel costs in Singapore increased by RMB0.376 billion from the same period last year, mainly due to increased fuel costs as a result of increased natural gas price. The fuel cost per unit of power sold by the Company's domestic power plants increased by 51.32% to RMB316.36/MWh from RMB209.07/MWh in 2020.

2.2.2 Maintenance

For the year ended 31 December 2021, the maintenance expenses of the Company and its subsidiaries amounted to RMB4.504 billion, representing a decrease of RMB498 million from RMB5.002 billion for the year ended 31 December 2020. The maintenance expenses of the Company's domestic operations decreased by RMB481 million compared to the same period last year. The maintenance expenses of operations in Singapore decreased by RMB17 million compared to the same period last year.

2.2.3 Depreciation

For the year ended 31 December 2021, depreciation expenses of the Company and its subsidiaries stayed stably at RMB22.270 billion, compared to RMB22.146 billion in the year ended 31 December 2020. The depreciation expenses of domestic operations increased by RMB283 million compared to the same period last year, of which the depreciation costs incurred by the newly acquired entities and new generating units was RMB1.326 billion. The depreciation expenses of the operations in Singapore decreased by RMB159 million compared to the same time last year, mainly due to the maturity of certain assets in the year of 2021.

2.2.4 Labor

Labor costs consist of salaries to employees and contributions payable for employees' housing funds, medical insurance, pension and unemployment insurance, as well as training costs. For the year ended 31 December 2021, the labor costs of the Company and its subsidiaries amounted to RMB16.107 billion, representing an increase of RMB1.604 billion from RMB14.503 billion for the year ended 31 December 2020. This is mainly attributable to the

MANAGEMENT'S DISCUSSION AND ANALYSIS

implementation of social security fee reduction in various regions in 2020 due to the COVID-19, and the increase of average social wage and social security contribution base in 2021, which resulted in a year-on-year increase in social security related expenses in 2021. Labor costs for Singapore operations increased by RMB14 million compared to the same time last year.

2.2.5 Other operating expenses (including electricity power purchase costs and service fees paid to HIPDC)

Other operating expenses include environmental protection expenses, insurance premiums, office expenses, amortization, Tuas Power's electricity power purchase costs, impairment losses, government subsidies and net losses on disposal of properties, plant and equipment. For the year ended 31 December 2021, other operating expenses of the Company and its subsidiaries was RMB20.866 billion, representing a decrease of RMB4.251 billion from RMB25.117 billion for the year ended 31 December 2020. The other operating expenses from the Company's domestic operations decreased by RMB10.601 billion mainly due to the decreased impairment recorded for the period, detailed information for which can be found in Note 6, 7 and 14 to the financial statements prepared in accordance with IFRS. Other operating expenses of the operations in Singapore increased by RMB5.001 billion compared to the same period last year. Other operating expenses of the operations in Pakistan increased by RMB1.349 billion compared to the same period last year, mainly due to the increased fuel costs led by the increase in coal price.

2.3 Financial expenses

Financial expenses consist of interest expense, bank charges and net exchange differences.

2.3.1 Interest expenses

For the year ended 31 December 2021, the interest expenses of the Company and its subsidiaries were RMB8.798 billion, representing a decrease of 4.37% from RMB9.201 billion for the year ended 31 December 2020. The interest expenses from the Company's domestic operations decreased by RMB186 million. The interest expenses from the newly acquired entities and new generating units were RMB836 million and those incurred by the existing entities in China decreased by RMB1,022 million, which is largely attributable to lower funding costs and decrease in debts.

The interest expenses of Singapore operations decreased by RMB88 million compared to the same period last year.

2.3.2 Net exchange differences and bank charges

For the year ended 31 December 2021, the Company and its subsidiaries recorded a net loss of RMB40 million from net exchange difference and bank charges, representing an increase of RMB141 million in loss compared with the net gain of RMB101 million for the year ended 31 December 2020. The operations in Singapore recorded net loss of RMB88 million in exchange changes and bank charges, representing an increase of RMB277 million in loss from the net gain of RMB189 million for the year ended 31 December 2020, mainly due to increase in US dollar-to-Singapore dollar exchange rates. The operations in Pakistan recorded net gain of RMB51 million in exchange losses and bank charges in 2021, representing an increase in net gain of RMB140 million as compared to a net loss of RMB89 million in 2020.

2.4 Share of profits less losses of associates and joint ventures

For the year ended 31 December 2021, the share of profits less losses of associates and joint ventures was RMB0.804 billion, representing a decrease of RMB970 million from RMB1.774 billion of last year, mainly due to the decreased profits of one of our associates, Shenzhen Energy Group Co., Ltd.

2.5 Income tax expenses

For the year ended 31 December 2021, the Company and its subsidiaries recognized income tax expenses of minus RMB1.930 billion, representing a decrease of RMB4,093 million from RMB2.163 billion for the year ended 31 December 2020. Our income tax expenses for our domestic operation decreased by RMB4.133 billion due to the loss incurred for our domestic operations. The income tax expenses for the operations in Singapore increased by RMB43 million.

2.6 Net profit, net profit attributable to equity holders of the Company and non-controlling interests

For the year ended 31 December 2021, the Company and its subsidiaries achieved a net loss of RMB13.191 billion, representing a decrease of RMB15.802 billion, or 605.21%, from a net profit of RMB2.611 billion for the year ended 31 December 2020; the net loss attributable to equity holders of the Company was RMB10.636 billion, representing a decrease of RMB13.014 billion from the net profit attributable to equity holders of the Company of RMB2.378 billion for the year ended 31 December 2020.

The profit attributable to equity holders of the Company from its domestic operations decreased by RMB13,016 million, mainly due to the sharp increase in the thermal coal purchase price. The net profit attributable to equity holders of the Company from its operations in Singapore was RMB123 million, representing a decrease of RMB15 million as compared to the same period last year. The net profit attributable to equity holders of the Company from its operations in Pakistan was RMB305 million, representing an increase of RMB17 million.

The Company's recorded profit from its non-controlling interests decreased to a loss of RMB2,555 million for the year ended 31 December 2021 as compared to the profit of RMB233 million for the year ended 31 December 2020, mainly attributable to the decline in net profit and increase in net loss of the Company's non-wholly owned subsidiaries.

2.7 Comparison of financial positions

2.7.1 Comparison of asset items

As of 31 December 2021, consolidated total assets of the Company and its subsidiaries was RMB500.771 billion, increased by 11.31% from RMB449.905 billion as of 31 December 2020; total assets of the domestic operations increased by RMB50.498 billion to RMB460.280 billion, including a net increase of RMB20.952 billion in non-current assets, which is mainly attributable to new construction outweighing the depreciation and leading to an increase in assets, a net increase in inventory of RMB9.993 billion, which is mainly attributable to the increased coal price and the increased replenished coal inventory of some power plants controlled by the Company, aiming to guarantee coal supply during seasons and to meet the demand of stable energy supply as instructed by NDRC policy, and a net increase in accounts and notes receivable of RMB4.721 billion, which was mainly attributable to increases in revenues and receivables of renewable energy subsidies.

As of 31 December 2021 total assets of the operations in Singapore were RMB27.088 billion, representing an increase of RMB222 million from the same period last year. Non-current assets decreased by RMB1.239 billion to RMB22.567 billion.

As of 31 December 2021, total assets of the operations in Pakistan were RMB13.403 billion, representing an increase of RMB146 million from the same period last year. Non-current assets decreased by RMB755 million from last year to RMB8.298 billion.

2.7.2 Comparison of liability items

As of 31 December 2021, consolidated total liabilities of the Company and its subsidiaries were RMB367.213 billion, representing an increase of 23.11% from RMB298.288 billion as of 31 December 2020.

As of 31 December 2021, interest-bearing debts of the Company and its subsidiaries totaled RMB297.703 billion. The interest-bearing debts consist of long-term loans (including those maturing within a year), long-term bonds (including those maturing within a year), short-term loans, short-term bonds and lease liabilities (including those maturing within a year).

As of 31 December 2021, the total liabilities of the operations in Singapore were RMB15.200 billion, representing an increase of 0.72% from RMB15.092 billion as of 31 December 2020. As of 31 December 2021, the total liabilities of the operations in Pakistan were RMB9.596 billion, representing a decrease of 1.40% from RMB9.732 billion as of 31 December 2020.

2.7.3 Comparison of equity items

Total equity attributable to the equity holders of the Company

MANAGEMENT'S DISCUSSION AND ANALYSIS

decreased by RMB16.798 billion as of 31 December 2021 as compared to 1 January 2021, resulting from a decrease of RMB10.934 billion arising from comprehensive net loss, a decrease of RMB2.826 billion arising from dividends, a decrease of RMB2.139 billion arising from the payments of interests for other equity instruments and a decrease of RMB899 million due to other reasons. Non-controlling interests decreased by RMB1,260 million in 2021.

2.7.4 Major financial position ratios

	2021	2020
Current ratio	**0.50**	0.43
Quick ratio	**0.41**	0.39
Ratio of liability to equity holders' equity	**3.25**	2.30
Multiples of interest earned	**-0.63**	1.38

Formula of the financial ratios:

$$\text{Current ratio} = \frac{\text{balance of current assets as of the year end}}{\text{balance of current liabilities as of the year end}}$$

$$\text{Quick ratio} = \frac{\text{(balance of current assets as of the year end – net inventories as of the year end)}}{\text{balance of current liabilities as of the year end}}$$

$$\text{Ratio of liabilities to shareholders' equity} = \frac{\text{balance of liabilities as of the year end}}{\text{balance of shareholders' equity (excluding non-controlling interests) as of the year end}}$$

$$\text{Multiples of interest earned} = \frac{\text{(profit before tax + interest expense)}}{\text{interest expenditure (inclusive of capitalized interest)}}$$

The current ratio and quick ration as of 31 December 2021 increased due to the increase of current assets as of the year end outweighing the increase of current liabilities, and the increase of current assets resulted from the increase in the operating revenue and accounts receivable led by the increase in the receivables of new energy subsidies, as well as the increased coal price and the increased replenished coal inventory of some power plants controlled by the Company, aiming to guarantee coal supply during seasons and to meet the demand of stable energy supply as instructed by NDRC policy. The ratio of liabilities to shareholder's equity as of 31 December 2021 increased due to the substantial decrease of net cashflow provided by operating activities and increase in debts for the purpose of our operation and construction activities in the ordinary course of our business. The multiples of interest earned was negative mainly attributable to the increased coal price, thus leading to the operating loss of domestic market.

B. LIQUIDITY AND CASH RESOURCES

1. Liquidity

	2021 RMB billion	2020 RMB billion	Change %
Net cash provided by operating activities	**6.033**	41.987	-85.63
Net cash used in investing activities	**-42.276**	-42.237	0.09
Net cash provided by financing activities	**39.386**	1.804	2,083.26
Currency exchange impact	**-0.846**	-0.739	14.48
Net increase in cash and cash equivalents	**2.297**	0.815	181.84
Cash and cash equivalents as at the beginning of the year	**13.258**	12.443	6.55
Cash and cash equivalents as at the end of the year	**15.555**	13.258	17.33

For the year ended 31 December 2021, net cash provided by operating activities of the Company and its subsidiaries was RMB6.033 billion, representing a decrease of 85.63% from last year, mainly attributable to the increased coal price, thus leading to the operating loss of domestic market, which in turn led to a substantial decrease in cash inflow provided by operation activities. The net cash provided by operating activities in Singapore was RMB1,751 million. The net cash provided by operating activities in Pakistan was RMB605 million. The net cash used in investing activities was RMB42.276 billion for the year ended 31 December 2021, representing an increase of 0.09% from last year, mainly due to the increase in the construction investments, including purchase of non-current assets, construction expenditure and construction material procurement. The net cash provided by financing activities was RMB39.386 billion for the year ended 31 December 2021, representing an increase of RMB2,083.26% billion from the last year, which was mainly due to the increase of net financing amounts of the Company for the year. As of 31 December 2021, the cash and cash equivalents of the Company and its subsidiaries denominated in RMB, Singapore dollar, U.S. dollar and other currencies were RMB13.879 billion, RMB699 million, RMB822 million, and RMB155 million, respectively.

As of 31 December 2021, net current liabilities of the Company and its subsidiaries were approximately RMB93.927 billion. Based on the Company's proven financing record, readily available banking facilities and sound credibility, the Company believes it is able to duly repay outstanding debts, obtain long-term financing and secure funding necessary for its operations. The Company has also capitalized on its good credit record to make short-term loans at relatively lower interest rates, thus reducing its interest expenses.

MANAGEMENT'S DISCUSSION AND ANALYSIS

2. Capital expenditure and cash resources

2.1 Capital expenditure on infrastructure construction and renovation projects

The actual capital expenditure of the Company in 2021 was RMB43.874 billion, which was mainly used for capital construction and renovation expenditures, including RMB3.788 billion for Zhuanghe Wind-power, RMB3.363 billion for Yantai New Energy, RMB3.288 billion for Clean Energy Tongyu, RMB2.018 billion for Pinghu Offshore, RMB1.651 billion for Ruijin Power, RMB1.402 billion for Jiutai Power, RMB1.284 billion for Shidongkou I, RMB1.233 billion for Qingdao Co-generation, RMB1.165 billion for Daqing Ranghulu, RMB1.078 billion for Dalian Co-generation, RMB1.070 billion for Da'an Clean Energy, RMB921 million for Zhejiang Cangnan Offshore, RMB851 million for Yangpu Co-generation, RMB821 million for Jiuquan Wind-power, RMB791 million for Poyang Luohong, RMB761 million for Shengdong Rudong Offshore, RMB644 million for Dalian Chuanbo, RMB572 million for Anhui Mengcheng Wind-power, RMB569 million for Yuhuan Power, RMB498 million for Fengcheng New Energy, RMB467 million for Diandong Kuangye, RMB462 million for Dezhou New Energy, RMB451 million for Diandong Energy, RMB446 million for Luobei Wind-power, and RMB435 million for Jiangxi Clean Energy. Capital construction and renovation expenditures for other projects were RMB13.845 billion.

The above capital expenditures are sourced mainly from internal capital, cash flows provided by operating activities, and debt and equity financing. In the next few years, the Company will further accelerate development and construction of renewable energy infrastructure and promote structural adjustment, and therefore expects to have significant capital expenditures. The Company expects to finance the above capital expenditures through internal capital, cash flows provided by operating activities, and debt and equity financing.

The cash requirements, usage plans and cash resources of the Company are as following:

(Unit: RMB100 million)

Capital Expenditure Project	Capital Expenditure Plan for 2022	Cash resources arrangements	Financing costs and note on use
Thermal power projects	60.46	Including internal cash resources and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Hydropower projects	0	Including internal cash resources and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Wind power projects	126.49	Including internal cash resources and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Coal mining projects	10.62	Including internal cash resources and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Photovoltaic power projects	186.09	Including internal cash resources and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Ports	0.2	Including internal cash resources and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Technology renovation etc.	74.39	Including internal cash resources and bank loans	Within the floating range of benchmark lending interest rates of PBOC

2.2 Cash resources and anticipated financing costs

Good operating results and sound credit status provide the Company with strong financing capabilities. As of 31 December 2021, the undrawn banking facilities available to the Company and its subsidiaries amount more than RMB300.0 billion, which are granted by commercial banks such as Bank of China, China Construction Bank and Industrial and Commercial Bank of China.

The Company completed issuances of unsecured super short-term bonds in 18 installments on January 20, January 25, February 25, April 26, April 29, July 9, July 16, July 22, August 6, August 30, September 3, September 10, October 15, October 22, October 27, November 4, December 13, and December 29, at principal amount of RMB2 billion, 3 billion, 3 billion, 2 billion, 3 billion, 2 billion, 3 billion, 2.5 billion, 1.5 billion, 2 billion, 3 billion, 1.5 billion, 1.5 billion, 3 billion, 2 billion, 5 billion, 3 billion and 200 million, with nominal annual interest rates of 2.2%, 2.3%, 2.4%, 2.1%, 2.1%, 2.1%, 2.1%, 2.0%, 2.0%, 2.1%, 2.1%, 2.0%, 2.1%, 2.2%, 2.1%, 2.4%, 2.2% and 2.6%, respectively. Each installment of the notes was denominated in RMB, issued at par value, and would successively mature in 37 days, 30 days, 41 days, 37 days, 36 days, 29 days, 29 days, 36 days, 54 days, 54 days, 54 days, 54 days, 29 days, 29 days, 36 days, 98 days, 29 days and 270 days from the value date.

The Company, through its subsidiary SinoSing Power, issued two tranches of secured corporate bonds of USD300 million and USD300 million on February 20, 2020 with coupon rate of 2.25% and 2.63%. The instrument was denominated in US dollars and issued at 99.653% and 99.277% of the par value with maturity of five years and ten years from the value date, respectively. The bonds are guaranteed by Huaneng Group.

As of 31 December 2021, short-term loans of the Company and its subsidiaries were RMB91.897 billion (2020: RMB66.311 billion). Loans from banks were charged at interest rates ranging from 2.00% to 11.35% per annum (2020: 2.15% to 4.90%).

As of 31 December 2021, short-term bonds payable by the Company and its subsidiaries were RMB8.223 billion (2020: RMB5.003 billion).

As of 31 December 2021, the Company and its subsidiaries' long-term loans (including long-term loans due within one year) totaled RMB154.072 billion (2020: RMB131.886 billion), including RMB loans of RMB138.436 billion (2020: RMB114.350 billion), USD loans of USD1.376 billion (2020: USD1.480 billion), EUR loans of EUR7 million (2020: EUR11 million), SGD loans of SGD1.456 billion (2020: SGD1.551 billion), JPY loans of 2.151 billion yen (2020: 2.266 billion yen). Among them, US dollar loans and Singapore dollar loans are floating rate loans, and other foreign currency loans are fixed rate loans. For the fiscal year ended 31 December 2021, the annual interest rate of long-term loans is 0.75% to 4.98% (2020: 0.75% to 6.55%).

The Company and its subsidiaries will closely monitor any change in the exchange rate and interest rate markets and cautiously assess the currency rate and interest rate risks.

Combining the current development of the power generation industry and the growth of the Company, the Company will make continuous efforts to not only meet cash requirements of daily operations, constructions and acquisitions, but also establish an optimal capital structure to minimize the cost of capital and manage financial risks through effective financial management activities, thus maintaining sustainable and stable returns to the shareholders.

2.3 Other financing requirements

Pursuant to the memorandum and articles of the Company, given the negative realized net profit attributable to the equity holders of the Company and considering the need for future investments in accordance with the Company's transformational development plans and the increased debt-asset ratio of the Company's in year 2021, the board of directors proposed that the Company pay no dividends in year 2021. The proposal has been reviewed and approved by the board of directors and the board of supervisors of the Company, subject to the approval at annual general meeting for year 2021.

MANAGEMENT'S DISCUSSION AND ANALYSIS

2.4 Maturity profile of loans and bonds

Maturity Profile (RMB100 million)	2022	2023	2024	2025	2026
Principal amount planned for repayment	**1,234.45**	256.49	446.69	153.28	139.90
Interest amount planned for repayment	**76.77**	62.17	50.28	38.83	32.88
Total	**1,311.22**	318.66	496.97	192.11	172.78

Note: The amount of principle to be paid in 2022 is relatively large because this includes expected repayment of short-term loans and short-term bonds.

C. LONG-TERM DEVELOPMENT STRATEGY AND PLANNING

The Company fully implements the new development philosophy of "innovation, coordination, green, openness and sharing," adheres to the idea of systemisation, follows the requirements of establishing a clean, low-carbon, safe and efficient modern energy regime, adheres to the principle of treating quality and efficiency as the key focus, reform and innovation as the driving force, institutional mechanism as the safeguard, and deepening the supply-side structural reforms as the cardinal line, coordinates the energy safety and "green development," comprehensively promotes the high-quality developments, and aims to further develop the Company into a proper managed, leading in technology, energy saving and environmental friendly, reasonable structured, excellently operated world-class listed power generation company with outstanding corporate governance and market value.

The Company adheres to the new energy safety strategy of "Four Revolutions and One Cooperation," promotes the green and low-carbon transformation of energy with the aims of peak carbon emission and carbon neutrality, prioritizes the quality and efficiency, insists on principles of "centralized and distributed construction of equal importance, and independent construction of priority". Making full use of the favorable conditions for centralized development of new energy power in "Three-North Area," coastal region, Southwest China region and certain areas in Central China region, the Company further develops large-scale clean energy production base, with the idea of "Three-types and Three-isations" namely "base-type, clean-type and complementary-type, together with intensification, digitalisation and standardization", promotes the leap-forward development of new energy production, accelerates the optimization and upgrading of coal-power structure, prioritizes the gas power and other clean energy power, and provides more competitive and finer comprehensive energy services. The Company proactively adapts to the national structural reform of energy supply, persists on accelerating digitalized transformation, actively develops strategic emerging industries, and carries out transformation of diversified supply and energy service around core industries. Adhering to the new development pattern of integrating domestic and international dual circulations, the Company will strength international cooperation with the principles of clean being primary, profitability being first and prudence being essential, to reinforce the efficient operation of oversea assets and to enhance the anti-risk ability and profitability. The Company aims to actively implement innovative development strategy, focuses on high-quality development led by technological innovation mechanisms, continues to serve the nationwide strategy, and adhere to the facing towards the Company's major demands. The Company adheres to digital & intelligent development, deepens and enhances the ability of independent innovation, implements scientific and technological demonstration projects, and strengthens basic and forward-looking technical research. The Company aims to

vigorously implement the excellent operation strategy, adhere to the strategies of increasing profitability, improving efficiency and creating value, reinforce its operational management, improve its management efficiency, optimize its asset structure, comprehensively improve its modern operating and management level, vigorously promote the improvement of quality and efficiency, improve corporate governance, enhance the Company's brand value and conscientiously perform its social responsibilities.

D. TREND ANALYSIS

Focusing on the general trend of national economic development and based on the principle of "priority on stabilization, and advancement from stabilization," the Central Economic Work Conference proposed several key goals as the fundamental principles and action guidance to follow for the national economy development in year 2022 and longer terms thereafter, such as to implement stable and effective macroeconomic policies, continue to stimulate the vitality of market entities, smoothen the national economic cycle, solidly implement science and technology policies, and stimulate developments by implementing reform and opening-up policies, and enhance the balance and coordination of the regional developments and securing the basic goals for residents' livelihood. The Conference also proposed that correct understanding of the essence of the carbon peak and carbon neutralization should be established, and the gradual withdrawal of traditional energy should be based on the safe and reliable substitution of new energy. Based on the basic national conditions of coal, we should pay attention to the clean and efficient utilization of coal, increase the consumption capacity of new energy, and promote the optimal combination of coal and new energy. At the same time, the Conference proposed that renewable energy and raw material energy consumption should not be calculated into the total energy consumption control.

In terms of the electricity supply and demand, according to the analysis and forecast of the China Electricity Council, with the considerations such as the domestic and international economic situation, the steady increment of electrification driven by electric power replacement, statistic comparison base of last year, as well as the uncertainty resulting from the epidemic and other the external events, it is estimated that the electricity consumption of the whole society will have a year-on-year increase of 5%-6% in year 2022, a growth rate that is four percentage points lower as compared to that in year 2021. It is estimated that in year 2022, the newly installed power generation capacity nationwide will be about 230 million kilowatts, a record high over the years, while the utilization hours for thermal units will decrease slightly on a year-on-year basis.

In terms of electricity market, on January 18, 2022, the NDRC and the National Energy Administration jointly issued "Guidance on accelerating the construction of a national unified power market system", aiming to realize the sharing, mutual assistance and optimal allocation of power resources across the country, and accelerate the formation of a unified, open, orderly, safe and efficient power market system with efficient governance. As all coal-fired electricity shall totally enter into trade within the electricity grid market as stipulated by principle, the transaction ratio of the total amount of electricity generated demonstrate an upward growth. And considering the combined effects of the fluctuations of coal market prices, the inter-provincial negotiation over electrovalence for outbound transactions, the spot electrovalence fluctuating with coal prices, and the electrovalence of pumped-hydroelectricity being set by the government, the rising range of the price of coal-fired electricity is expected to be less than 20%. Affected by the increase in the number of new energy parity projects putting into operation, the prices of wind and photovoltaics have decreased compared with year 2021, while the price of hydropower electricity remains the same as that of year 2021. In respect of carbon market, China Carbon Emission Trade Exchange (CCETE) was officially launched in year 2021, with the first fulfilment cycle during year 2019 to year 2020 closed smoothly. Carbon emission quota is expected to be tightened under the background of relevant national policy switching

MANAGEMENT'S DISCUSSION AND ANALYSIS

from "dual energy consumption control" to" dual control of carbon emission amount and emission intensity".

In terms of the coal market, the CPC Central Committee currently attaches great importance to the safe supply of coal production, and the relevant governmental authorities issued multiple industry policies to stabilize the supply and demand of coal market. On February 24, 2022, the NDRC issued the "Notice on Further Improving the Coal Market Price Formation Mechanism," specifying that mid- and long-term coal supply contracts should adopt the reasonable price range between RMB570 to RMB770 per ton (tax inclusive) and making it clear that pricing adjustment measures regarding coal price will be made pursuant to the Pricing Law. Such measures are expected to facilitate the normalization of thermal coal price. On the coal consumption side, given the establishment of the policy on controlling the increase of coal consumption during the "Fourteenth Five-Year" period and the scale development of the renewable energy section, it is expected that the increase of the coal demand shall slowdown in year 2022. While on the supply side, the advanced production capability has been gradually released domestically, which, together with the fact that coal exportation by Indonesia restored at a normal level, shall improve the supply situation of the thermal coal market. With the supply-demand situation significantly improved as compared to 2021, it is expected that the coal price will fall into a more reasonable range.

In terms of the capital market, the monetary policy in 2022 is expected to be prudent with proper flexibilities, which will increase the intensity of cross-cycle adjustment, give full play to the dual functions of the total amount and structure of monetary policy tools, and focus on sufficient effectuation, precise effectuation, and forward effectuation, aiming to meet the reasonable and effective financing needs of the real economy without having "flooding irrigation" effects, and focus on increasing financial support for key areas and weak links of the economy, so as to achieve a better goal combining the stabilized total volume with an optimized structure and maintain a reasonably abundant liquidity.

E. PERFORMANCE OF SIGNIFICANT INVESTMENTS AND THEIR PROSPECTS

The Company acquired 25% equity interest in Shenzhen Energy Group for RMB2.39 billion on April 22, 2003. In 2011, Shenzhen Energy Group divided into a remainder company of the same name and a new company Shenzhen Energy Management Company ("SE Management"), and the Company holds 25% equity interests in each of the two successors. The Company acquired 200 million shares from Shenzhen Energy Corporation ("Shenzhen Energy"), a subsidiary of Shenzhen Energy Group in December 2007. Shenzhen Energy allotted shares with its capital surplus in 2011. In February 2013, Shenzhen Energy merged SE Management through the combination of directional seasoned offering and cash payment to shareholders of SE management, Shenzhen State-owned Assets Administration Commission and the Company. After the merger, the Company held 661 million shares of Shenzhen Energy, representing 25.02% of its equity interests. In 2021, Shenzhen Energy distributed RMB0.50 of cash dividend and a two-share share dividend out of every 10 shares to its shareholders, and the Company held 1,190 million shares of Shenzhen Energy by 31 December 2021. These investments brought a net profit attributable to the equity holders of the Company of RMB331 million for the year ended 31 December 2021 under IFRS. This investment is expected to provide steady returns to the Company.

The Company held 60% direct equity interest in Huaneng Sichuan Energy Development Co., Ltd ("Sichuan Energy Development") as of 31 December 2006. In January 2007, Huaneng Group increased its capital investment in Sichuan Energy Development by RMB615 million, thus reducing the Company's equity interest in Sichuan Hydropower to 49% and making Huaneng Group the controlling shareholder of Sichuan Energy Development. This investment brought a net profit attributable to the equity holders of the Company of RMB201 million for the year ended 31 December 2021 under IFRS.

This investment is expected to provide steady returns to the Company.

F. EMPLOYEE BENEFITS

As of 31 December 2021, the Company and its subsidiaries had 57,513 employees within and outside the PRC. The Company and its subsidiaries provide employees with competitive remuneration and linked such remuneration to operating results to provide incentives for the employees. Currently, the Company and its subsidiaries do not have any stock or option based incentive plan.

Based on the development plans of the Company and its subsidiaries and the requirements of individual positions, together with consideration of specific characteristics of individual employees, the Company and its subsidiaries tailored various training programs for their employees on management, technology and the skills. These programs enhanced the comprehensive skills of the employees.

G. GUARANTEE FOR LOANS AND RESTRICTED ASSETS

As of 31 December 2021, the Company provides guarantee to long-term bank loans of Tuas Power Ltd of RMB6.257 billion (2020: RMB7.053 billion).

As of 31 December 2021, the details of secured loans of the Company and its subsidiaries were as follows:

As of 31 December 2021, pledge and mortgage loans of the Company were RMB12.333 billion (2020: RMB11.105 billion).

As of 31 December 2021, short-term loans of RMB829 million (2020: RMB1,317 million) represented the notes receivable that were discounted with recourse. As these notes receivable had not yet matured, the proceeds received were recorded as short-term loans.

As of 31 December 2021, long-term loans of RMB4.595 billion (2020: RMB3.322 billion) of the Company and its subsidiaries were secured by certain property, plant and equipment with net book value of approximately RMB5.025 billion (2020: RMB3.400 billion).

As of 31 December 2021, long-term loans of approximately RMB4.516 billion (2020: RMB7.435 billion) were secured by future electricity revenue of the Company and its subsidiaries. Long-term loans of approximately RMB2.814 billion (31 December 2020: nil) were secured by equity interests of a subsidiary of the Company. Long-term loans of approximately RMB20 million were secured by carbon emission trading rights (31 December 2020: nil).

As at 31 December 2021, certain land use right with net book value of RMB17 million (31December 2020: nil) was in a state of seizure due to pre-litigation preservation.

As of 31 December 2021, the restricted bank deposits of the Company and its subsidiaries were RMB796 million (2020: RMB614 million).

H. ACCOUNTING STANDARDS HAVING MATERIAL IMPACT ON THE COMPANY'S FINANCIAL STATEMENTS

For the accounting standards that have a material impact on the Company's financial statements, please refer to the Note 2 to the financial statements prepared in accordance with IFRS.

I. RISK FACTORS

1. Risks relating to COVID-19

Although the COVID-19 epidemic has been effectively controlled, there is still the risk of localized and seasonal outbreaks, which may impact the macro economy, electricity demand, project construction, coal production, and transportation to certain extent.

MANAGEMENT'S DISCUSSION AND ANALYSIS

The Company will strictly implement regular COVID-19 prevention and control measures, and strictly implement emergency plans to ensure that risks in relation to personnel safety, power generation, new units construction, material supply, and fuel supply are controllable and under control.

2. Risks relating to the electricity industry and market

Firstly, with the introduction of carbon peak and carbon neutral targets, and related policies in China and other countries around the world, the planning and commissioning of a large number of new energy projects in the future will have a direct impact on the traditional thermal power business. Unit utilization hours may continue to decline, and we may be forced to shut down some small units as results of policy requirements and actual operation conditions. Other related policies restricting thermal power may also have a negative impact on the Company's domestic and overseas thermal power business.

Secondly, the "dual energy consumption control" policy applicable to the coal-fired power plants in China has been gradually shifting to the "dual control of carbon emission amount and emission intensity" policy. Given factors such as the power generation capacity and cost recycle regime and ancillary service market are yet to develop, and the market mechanism on the coordination of electrovalence and coal price is yet to be established, the choices for power generation enterprises to optimize their expenses and costs for power generation are still limited, which in return increased the operating risks for coal-fired power generation business. Some high-energy-consuming users will be limited in power consumption and the total amount of regional coal consumption will be also limited. Under such background, the demand for coal-fired power will be compressed and there exists a risk of the decline in the utilization hours for the coal-fired power units.

Thirdly, as the reform process of China's power market is further accelerated, the scale of direct transactions continues to expand, spot market pilots are fully promoted, and new energy power transactions have begun. In 2022, the power and coal supply situation is still unclear, and it is expected that the market competition shall be fiercer, with uncertainties increased, leading to a risk of the declining of transaction price of the generated electricity.

Fourthly, with new energy units commissioned, in 2022, the non-fossil energy units are expected to account for 50% of all units nationwide. Due to the production characteristics of new energy units, it is expected that during summer and winter peaks, the power supply in certain regions may witness tight-in-supply periods, which poses higher requirements in respect of the ancillary services capacity of the coal-fired power units.

The Company will actively promote the "green" transformation and accelerate the increase in the proportion of clean energy. Through alternative development, transformation and upgrading, decommission and storing for backup, and capital operation, the Company aims to achieve the structural optimization and upgrading of its coal-fired power units, and shall make coordinated arrangements on the energy saving and emission reduction upgrading and transformation, flexibility upgrading and transformation, heating upgrading and transformation, biomass coupling upgrading and transformation for our current coal-fired units, to create a new competing edge. The Company shall also strengthen policy research, actively adapt to the development of the electricity market under the "dual carbon" goal, continue to promote the standardized operation of the market, adjust pricing strategies in a timely manner, and make every effort to prevent and control electricity price risks.

3. Risks relating to coal market

Firstly, China's control over the coal market has been strengthened. With the coal market showing an obvious "policy-driven market" characteristic, the future uncertainty with respect to coal price shall continue to increase.

Secondly, affected by the ban on the coal exportation of Indonesia and the uncertainty of global situation, the supply and demand of international coal market might be tension, and the supplement function of imported coal might be weakened.

Thirdly, the national environmental protection and safety inspectors maintains a normalized high pressure, and the release of coal production capacity in the main production areas will be affected to a certain extent.

Fourthly, in 2022, most international economies choose to coexist with the epidemic, and the pace of economic recovery will accelerate. China's "stabilizing growth" economic strategy continues to exert its force with the policy of dual control of energy consumption being more flexible, the production of industrial products will remain strong, and the consumption of coal may continue to increase, which will impact the supply of thermal coal to certain extent.

The Company will closely follow the changes in national policies and the coal market, strive to enter into medium and long-term coal contracts with suppliers, strengthen cooperation with competitive large mines, and ensure the strict performance of contracts and the safe and stable supply of coal. The Company shall comprehensively consider factors such as resource origin, transportation mode, coal type matching, etc., to continue to optimize the supply structure and achieve optimal procurement costs, strengthen inventory management, have the off-season coal storage management play a meaningful role, increase the intensity of economic coal blending, and take multiple measures to reduce the cost of coal procurement.

4. Risks relating to carbon markets

The national carbon emission quota trading market has been launched. Units with higher carbon emission intensity will bear increased cost of carbon transaction performance, while units with lower carbon emission intensity can obtain emission reduction benefits. The Company maintains industry-leading overall energy utilization level. In the years of 2019 and 2020, the overall carbon trading performance cost of the Company is considered at a better level compared with other industry peers. However, since the quota allocation plan for 2021 and subsequent years has not yet been issued, and the allocation of quotas will gradually tighten, the risk of increased power generation costs exists. In addition, at the initial stage of the carbon market, the transactions between institutions and individuals have not been included, and if, at a later stage, institutions and individuals can enter into the market for transactions, there is a risk of increased performance costs for power generation companies. Besides, the Singapore government recently announced that it planned to further increase the level of carbon tax during year 2024 and year 2025. Such policy is expected to affect the profitability of Tuas Power, if the carbon tax cannot be transmitted to end users through market.

The Company will pay close attention to both domestic and foreign carbon market policies, continue to strengthen carbon trading management, formulate carbon trading strategies, closely monitor to the progress of the restart of voluntary emission reduction projects, make full use of offset policies, and strive to complete the national carbon market trading performance work on schedule at a lower cost.

5. Environmental protection risk

The newly built units of the coal-fired power plants of the Company are all equipped with technological advanced and powerful flue gas purification systems. Other units have also completed ultra-low emission transformation pursuant to the requirements of the Chinese authorities, affording such units good adaptability to the fluctuations of internal and external factors such as weather conditions, fuel quality and electric heat load. Such units have also passed the inspection procedure conducted by the local environmental protection authorities and been recognized by the energy regulatory agency.

Based on the current status and the needs of ecological civilization construction, the Chinese government is constantly improving and deepening environmental protection policies in key regions including but not limited to Beijing-Tianjin-Hebei,

MANAGEMENT'S DISCUSSION AND ANALYSIS

Yangtze River Economic Belt, Pearl River Delta, etc., which may lead to more new and stringent requirements with respect to issues such as water body protection and flue and dust treatment etc.

The Company closely monitor the areas of concern of the environmental protection authorities, by carefully selecting advanced and applicable technical solutions, and making achievements in improving the wastewater treatment system, building closed facilities for coal yard, and improving the comprehensive utilization of ash and slag, so as to ensure that various environmental risks are responded to in a timely manner and effective resolution.

6. Capital market risks

In 2021, the Company's expenditure on the procurement of fuel increased significantly, leading to a significant decrease in operating cash flow. Good operating results and sound credit status provide the Company with strong financing capabilities, making it accessible and convenient for the Company to raise fund to ensure the overall capital operation, meanwhile, leading to the significant increase of debt financing scale. It is expected that the Company's overall debt ratio, debt risks, and financial costs will increase apparently.

According to the Work Report of the State Council and Monetary Policy Implementation Report of the People's Bank of China, the monetary policy in 2022 is expected to be prudent with appropriate flexibilities, which will increase the intensity of cross-cycle adjustment, give full play to the dual functions of the total amount and structure of monetary policy tools, and focus on sufficient effectuation, precise effectuation, and forward effectuation, aiming to meet the reasonable and effective financing needs of the real economy without having "flooding irrigation" effects, and focus on increasing financial support for key areas and weak links of the economy, so as to achieve a better goal combining the stabilized total volume with an optimized structure and maintain a reasonably abundant liquidity. With respect to debt denominated in foreign currencies, given the Company has only a small amount of such debts, the fluctuation in the corresponding interest rates has a less meaningful impact on the Company.

In 2022, the Company will focus on the improvement of operating result, enhance capital operation, innovate financing instrument and expand financing channels. The Company will also proactively take advantage of green finance policy and speed up capital turnover by means of the issuance of energy supply bonds and increase in issuance of ultra-short financing bonds. Meanwhile, the Company will pay close attention to changes in domestic and overseas capital markets, adjust financing strategies in a timely manner on the premise of ensuring capital needs, seize the market window period, make good use of policy tools such as carbon emission reduction support tools and special re-lending tools for supporting clean and efficient use of coal, to reduce interest rates fluctuation risks and make efforts to control financing costs, to realise cost reduction and efficiency improvement.

CORPORATE GOVERNANCE REPORT

The Company has been consistently stressing the importance of corporate governance. The Company have established and improved a sound corporate governance structure consisting of the shareholders' general meeting, the Board, the Supervisory Committee, and the management team and built an operating mechanism with clear separation of powers and responsibilities between proprietorship, decision-making power, supervisory power, and management powers, 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. After years of exploration and practice, the Company has built up a normal, sound and effective corporate governance system that caters for the development of the Company. The Company insists on adopting the principle of "maximizing the benefits of the Company and all shareholders" as the starting point and treats all shareholders fairly in order to strive for the generation of long-term, stable and growing returns for shareholders.

The Company has complied with the provisions of the Corporate Governance Code in Appendix 14 to the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (the "Listing Rules") during the Reporting Period. In 2021, pursuant to the requirements of the Hong Kong Stock Exchange's Environmental, Social and Governance Reporting Guidelines amended on 18 December 2019, the Company attaches great importance to organizing and arranging for the preparation and disclosure of the Environmental, Social and Governance Report on time and with good quality which was published on the website of the Company and the website of the Hong Kong Stock Exchange together with the annual report as scheduled.

(A) CORPORATE GOVERNANCE PRACTICES

In recent years, the Company adopted the following measures to strengthen corporate governance and to enhance the Company's operation quality:

(1) Enhancing and improving corporate governance

As a public company listed in three markets both domestically and internationally, the Company is subject to the regulations of the security regulatory authorities of the three listing venues and the supervision of investors at large. Since its establishment, the Company has been strictly complying with the laws and regulations of its listing place and continuously completing and improving its modern governance system and capacity. The Company have established and improved a corporate governance structure consisting of the shareholders' general meeting, the Board, the Supervisory Committee, and senior management and built an operating system where those granted with proprietorship, 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, as well as the efficiency and compliance of the operation and management of senior management. After years of exploration and practice, the Company has built up a normal, sound and effective corporate governance system that caters for the development of the Company.

In 2021, faced with the normalization of the COVID-19 epidemic and the complex and severe business situation, the Company always adhered to the mission of becoming a "three-color company". Under the correct leadership of the Board, we made concerted efforts and faced up to difficulties, actively responded to the changes in the market of electricity, coal and capital, coordinated the prevention and control of the epidemic, energy supply and safety production, achieved a "double rise" in production capacity and output, and achieved effective cost control. The Company has scientifically planned the "14th Five-Year" plan, seized the development of new

CORPORATE GOVERNANCE REPORT

energy resources with high quality, accelerated the optimization and adjustment of coal power structure, and further accelerated the pace of low-carbon transformation and upgrading. Focusing on improving competitiveness, the Company has promoted core technological breakthroughs, accelerated digital transformation, and improved its science and technology innovation system, thus significantly enhancing its independent innovation capability. Adhering to openness and cooperation, the international management capability has been continuously improved. The Company has strengthened the leadership of Party building, pushed the corporate reform to deeper development and continuously improved the management level of the Company. The Company has actively implemented the carbon peak action plan and continuously promoted high-quality development in accordance with the requirements of building a clean, low-carbon, safe and efficient modern energy system.

The Company has always adhered to lawful corporate governance and compliant operations. The Company has continued to pay attention to new changes in national and listing regulatory laws and regulations, earnestly implemented new regulatory policies and requirements, continuously consolidated risk prevention and control, steadily promoted internal control management, carried out high-quality information disclosure, proactively strengthened communication and interaction with investors, continuously promoted the construction of ESG system, built a harmonious and win-win corporate culture with stakeholders, actively safeguarded the interests of shareholders, striven to protect the legitimate rights and interests of small and medium-sized investors, and promoted the continuous improvement of corporate governance.

In 2021, all directors and supervisors of the Company have demonstrated dedication and diligence in their decision-making, convened 11 Board meetings and four meetings of the Supervisory Committee in a compliant and efficient manner, and considered 68 proposals including the Company's regular reports, profit distribution, change of supervisors, institutional adjustment, and budget for daily connected transactions. The Company has convened ten meetings of special committees to consider the annual comprehensive risk management report of the Company, listen to the report on the total payroll of the Company, and regularly communicate with the Company's legal advisors, the Company's external auditors, the Company's management and relevant functional departments to understand the update and implementation of applicable regulations in the places where the Company is listed, the effectiveness and implementation of the Company's internal control, and the external audit, and to make relevant comments and suggestions. The convening and holding procedures of the above meetings, the qualifications of the conveners, the qualifications of the attendees and the voting procedures were in compliance with the relevant laws and the relevant provisions of the Articles of Association of the Company, and all the proposals were successfully passed for consideration and the voting results were valid.

With the strong support of all Shareholders, the Company achieved new progress in various aspects of its work and was recognized by the capital market and investors. The Company was awarded "Excellent Issuer of Corporate Bonds", "A" grade rating for annual information disclosure granted by the Shanghai Stock Exchange, the Golden Bauhinia Award for the "Best Listed Company" by the China Securities, and "Top 50 Outstanding Listed Company for the Year" by Interface News, etc. In addition, the Company's ESG practice experience was extracted to White Paper on the ESG Development of Listed Companies in China (2021) (《中國上市公司 ESG 發展白皮書(二零二一)》) by China Association for Public Companies and recorded as the first case in the ESG Practice Case for Listed Companies (《上市公司 ESG 實踐案例》) by China Association for Public Companies, and was invited to introduce the Company's ESG practical experience to the Main Board of the Shanghai Stock Exchange and listed companies in the Science and Technology Innovation Board at the ESG special training held by the Shanghai Stock Exchange. The above honors have better expanded the Company's popularity in the capital market and consolidated and maintained a good corporate brand image.

The Board takes joint responsibility for the corporate governance of the Company. During the Reporting Period, the Board has included the following in its scope of powers and duties:

- Formulating and reviewing the Company's corporate governance policy and general rules, and making such amendments as it deems necessary to such policy and rules in order to maintain the effectiveness thereof;
- Reviewing and monitoring the training and sustained professional development of the Company's directors and senior management;
- Reviewing and monitoring the Company's policy and general rules for complying with laws and regulations;
- Formulating, reviewing and monitoring the codes of conduct and compliance handbook applicable to the Company's directors and employees; and reviewing the Company's compliance with the Code and the disclosures made in the Corporate Governance Report.

(II) Enhancing and improving the information disclosure system

The Company has been stressing the importance of public information disclosure. The Company has established the Information Disclosure Committee comprised of the Board Secretary, the chief accountant and managers of various departments, which is responsible for reviewing the Company's regular reports. The Company has implemented the system of holding regular information disclosure meetings every Monday, chaired by the Board Secretary and attended by relevant business departments, at which the important matters related to the operation of the Company is reported and discussed, thereby warranting the Company's performance of the relevant information disclosure obligations in a timely manner. The Company has successively formulated and implemented the relevant information disclosure system, and has made timely amendments thereto according to regulatory requirements. The current systems which have been implemented include the Measures on Information Disclosure Management, the Measures on Related Transactions Management, the Management Measures of Insider Information, the Rules on Investor Relations Management, the Rules on the Work of the Information Disclosure Committee and the Rules on the Annual Report Information Disclosure Significant Errors Accountability, etc.. In 2021, pursuant to the relevant regulatory regulations and requirements and according to the actual situation of the Company, the Company revised the Measures on Information Disclosure Management and the Management Measures of Insider Information accordingly to ensure the Company's system meet the latest regulatory requirement. The above measures and system ensure the regulated operation of the Company, strengthen the truthfulness, accuracy, completeness and the timely disclosure of information, and at the same time enhance the quality as well as transparency of information disclosure.

Relevant departments of the Company compiled answers (and subsequent updates) to questions regarding the hot topics of market concerns, the Company's production, operation and operating results in a timely manner, which shall become the basis of external communication of the Company after being approved by the Company's management and the authorized representatives of the Information Disclosure Committee. Also, the Company conducts specialized trainings for the staff of the Company who are responsible for information disclosure on an irregular basis in order to continuously enhance their expertise.

CORPORATE GOVERNANCE REPORT

(III) Regulating financial management system

The credibility of a listed company, to a large extent, relates to the quality of the preparation of financial statements and a regulated operation of financial activities. In 2021, the Company continued to carry out various detailed work on the preparation of financial reports and standardized financial operation under the principle of acting with honesty and integrity and treating shareholders in a fair manner. The details include:

1. In order to strictly implement the accounting regulations, accounting standards and accounting systems, to strengthen accounting and accounts supervision, and to truthfully and fairly reflect the financial position, operating results and cash flow, the Company has formulated the Measures on Accounting, the Administrative Measures for Financial and Accounting Reports, the Measures on Basic Construction of Financial Management, the Provisions on Fixed Assets Management, Lists of Fixed Assets, the Provisions on Cost Management and Regulations on Management of Joint Examination of Final Accounts. The Company's Board, Supervisory Committee and the Audit Committee have examined the Company's financial reports on a regular basis and the Company has fulfilled the requirements of making the Chairman, the President and the Chief Accountant responsible for the authenticity and completeness of the financial reports.

2. In regard to fund management, the Company has successively formulated a number of management measures including the Measures on Financial Management, the Measures on the Management of Funds Receipts and Expenses, the Measures on Use and Management of Funds in Large Sums by the Company Headquarters, the Rules on the Management of Bills of Exchange, the Measures on Management of Fund Raising, the Measures on the Management of Derivative Financial Product Transactions, the Administrative Measures on Financing Guarantee, the Rules on the Implementation of External Guarantee and the Measure on the Management of Regulating Fund Transfers with Related Parties. The Company's Articles of Association also set out provisions relating to loans, guarantees and investment. In the annual reports of the Company over the previous years, the Company has engaged registered accountants to conduct an examination on the use of funds by the controlling shareholder and other related parties and issue individual statements according to the requirements of the China Securities Regulatory Commission ("CSRC") and the Shanghai Stock Exchange ("SSE"), and there has not been any violation of rules relating to the use of funds. Moreover, the Company also conducted quarterly checking and clearing with related parties in relation to the operational fund transfers in order to ensure the safety of funds.

(IV) Risk Management and Internal Control

The Board of Directors attaches great importance to management of enterprise risk and internal control, thus the Company establishes a system of risk monitoring and internal control, and keeps optimizing it to ensure its effectiveness, with a hope to create value for the Company, promote the realization of business development goals, and protect the interests of shareholders and the Company's assets.

1. Risk Management

To enhance its anti-risk ability and promote the sustainable development, the Company has applied the basic risk control procedures in every aspect of management and operation. Meanwhile, a comprehensive risk management system is established and the Company has cultivated a good risk management culture and carried out the risk control throughout the Company.

The Company headquarters and all management units have set up a risk management function with a clear definition of their respective responsibilities, and has established a smooth risk reporting and early warning mechanism, so that risk management is carried out throughout the daily work.

The Company conducts comprehensive risk management. The basic processes include initial risk information collection, risk identification and assessment, risk mitigation and supervision and improvement of risk management. The Company regularly prepares comprehensive risk management reports. The Strategy Committee under the Board of Directors is responsible for the decision-making of the Company's overall risk management and listens regularly to the relevant reports, and its responsibilities include but are not limited to the examination and approval of the annual report on the overall risk management, the assessment of the risk management and the assessment of its effectiveness and the risk assessment report for significant decisions. The Audit Committee under the Board of Directors will identify and evaluate the fraud risk of senior management and the Board of Directors, and will form an independent fraud risk assessment report.

In 2021, the Strategy Committee of the Board of Directors held meeting to consider and approve the Company's Overall Risk Management Report for the Year 2021. During the Reporting Period, the Company has complied with the Corporate Governance Code and the relevant provisions on risk management and internal control.

In 2021, with the joint efforts of the whole Company on risk identification, risk assessment, risk prevention and control and implementation of relevant measures, the risk management get more standardized in daily work with continuous improvement, and the Company has generally achieved positive results in the prevention and control over major risks and other risks, and minimized the impact of risk on business development.

2. Internal Control

The overall objective of the Company's internal control work is to promote the implementation of corporate strategies, in particular, to provide reasonable assurance for the compliance of the Company's operation and management with applicable laws and regulations, the security of the Company's assets and the authenticity and completeness of the Company's financial reports and relevant information, so as to promote the overall improvement in efficiency and effectiveness of operations.

The Company fully collated the potential internal and external risks and various business processes and compiled the Internal Control Handbook, and in the sixth edition of the Internal Control Handbook, it sets out detailed provisions for 25 business processes (including income, procurement of materials, fuel management, fund management) and 19 soft elements (including organizations structure, human resources management, anti-embezzlement, risk management) from five perspectives (control environment, risk evaluation, control process, information and communication, monitoring), fully describes the policy and principles of the Company, clarifies the working procedure and responsibility of each job position in the Company and regulates the standard procedure for dealing in the businesses of the Company, thus setting out clear procedures for its system. The Company has also compiled the Internal Control Assessment Handbook to help implement the three-level management system for internal control assessments as well as internal control assessment mode which integrates routine assessments with focused surveillance, with a view to standardising the procedures and assessment method of internal control assessments and regulating the procedures and standards for deficiency definition, striving to standardize and regulate its internal control assessments. Each year, the Company evaluates the effectiveness of the above systems and makes regular modifications and improvements to them as part of the dynamic maintenance of the internal control system.

For the risks identified, the Company provides for control measures in the Internal Control Handbook and defines key control points through which the responsibility of internal control is allocated to each working position, so that all the staff members of the Company become a part of

CORPORATE GOVERNANCE REPORT

the internal control construction force. The Company adopts a routine assessment system, where internal control assessors are designated to all the departments and subordinate entities to conduct monthly internal control assessments. It also builds up three levels of assessments (the Company, the regional branches, the grass roots units) through the internal control management system to track the implementation of control in real time. During the year, the Company has successfully completed the 12-month routine internal control assessments, thereby effectively safeguarding and promoting the sustained and healthy development of the Company's businesses and ensuring the sound and stable operation of the internal control system. Taking into account the new requirements on and changes in its business and management as well as its advanced experience and common issues accumulated over the years, each year the Company organizes all-around multi-level internal control trainings to deliver a full-range propaganda on the philosophy and knowledge for internal control, which helps build up the internal control environment within the Company.

The internal control management department, the internal audit department and the external auditors made regular report separately on their internal control work to the Audit Committee of the Board of Directors, which ensures the sustained and effective operation of the internal control system. This year, the Company comprehensively revised the "Regulations on the Internal Control Review and Evaluation", improved and adjusted the assessment contents and assessment methods, and gave full play to the commanding role of internal control assessment. The Company conducted the assessment on the internal control targets each year, and appraisal results are timely published to draw all levels' attention to the quality of the internal control work so as to achieve effectively the objective of strengthening management through internal control.

Based on a comprehensive assessment, the Board of Directors consider that, as of 31 December 2021, the Company has maintained effective internal control over financial reporting in all material respects in accordance with the Fundamental Regulatory Guidelines on Enterprise Internal Control (and its guidance) and Section 404 of the Sarbanes-Oxley Act. Besides, the Company has not found any material defect in non-financial reporting about internal control.

(B) SECURITIES TRANSACTIONS BY DIRECTORS

As the Company is listed in three jurisdictions, the Company has strictly complied with the relevant binding provisions on securities transactions by directors imposed by the regulatory authorities of the US, Hong Kong and China Mainland and we insist on the principle of complying with the strictest provision, which is, implementing the strictest provision among three places. We have adopted a set of standards not less exacting than the Model Code for Securities Transactions by Directors of Listed Issuers set out in Appendix 10 to the Listing Rules as the model code for securities dealings by Directors of the Company. In the first half year of 2021, the Company revised and implemented the Management Rules in respect of the Shares of the Company held by the Directors, Supervisors and Senior Management of Huaneng Power International, Inc. in accordance with relevant regulatory requirements, which required the transfer of the Company's shares be strictly in accordance with the stipulations under the Company Law and relevant regulations, prohibits those who are in possession of securities transaction insider information using insider information in securities trading and sets out detailed rules for those who are in possession of insider information. Following a specific enquiry on all the Directors and senior management of the Company, all the Directors and senior management currently do not hold any shares in the Company and there is no material contract in which the Directors and senior management directly or indirectly have material interests.

(C) BOARD OF DIRECTORS

The Board of Directors of the Company comprises of 15 members. Of the members of the Tenth Session of the Board of Directors, Mr. Zhao Keyu is the Chairman, and Mr. Zhao Keyu and Mr. Zhao Ping are the executive Directors of

the Company; Mr. Huang Jian, Mr. Wang Kui, Mr. Lu Fei, Mr. Teng Yu, Mr. Mi Dabin, Mr. Cheng Heng, Mr. Li Haifeng and Mr. Lin Chong are the non-executive Directors; and there are five independent non-executive Directors, namely Mr. Xu Mengzhou, Mr. Liu Jizhen, Mr. Xu Haifeng, Mr. Zhang Xianzhi and Mr. Xia Qing, accounting for one third of the members of the Board.

During the Reporting Period, the Board of Directors of the Company held eleven meetings including regular meetings and ad hoc meetings. For details, please see related announcements.

Details of the attendance of directors at the Board meetings are as follows:

Name	Number of meetings to be attended	Number of meetings attended in person	Number of meetings attended by proxy	Attendance rate (%)
Executive Directors				
Zhao Keyu	11	11	0	100%
Zhao Ping	11	11	0	100%
Non-executive Directors				
Huang Jian	11	11	0	100%
Wang Kui	11	9	2	81.8% (Attendance by proxy rate 18.2%)
Lu Fei	11	10	1	90.9% (Attendance by proxy rate 9.1%)
Teng Yu	11	10	1	90.9% (Attendance by proxy rate 9.1%)
Mi Dabin	11	10	1	90.9% (Attendance by proxy rate 9.1%)
Li Haifeng	11	11	0	100%
Cheng Heng	11	10	1	90.9% (Attendance by proxy rate 9.1%)
Lin Chong	11	11	0	100%
Independent Non-executive Directors				
Xu Mengzhou	11	11	0	100%
Liu Jizhen	11	9	2	81.8% (Attendance by proxy rate 18.2%)
Xu Haifeng	11	10	1	90.9% (Attendance by proxy rate 9.1%)
Zhang Xianzhi	11	11	0	100%
Xia Qing	11	11	0	100%

CORPORATE GOVERNANCE REPORT

As stated in previous Corporate Governance Reports of the Company, the Company's Articles of Association set out in detail the duties and operational procedures of the Board (please refer to the Company's Articles of Association for details). The Board of the Company holds regular meetings to hear and review the report on the Company's operating results. Material decisions on operation shall be discussed and approved by the Board. Ad hoc meetings may be held when necessary to make timely decision. Board meetings include regular meetings and ad hoc meetings. Regular meetings of the Board include: annual meeting, first quarterly meeting, half-yearly meeting and third quarterly meeting.

All arrangements for regular meetings have been notified to all directors at least 14 days in advance and the Company has ensured that each director thoroughly understood the agenda of the meeting and fully expressed his/her opinions, while all Independent Non-executive Directors expressed their independent directors' opinions on their respective duties. Minutes have been taken for all the meetings and filed at the Office of the Board of Directors of the Company.

Moreover, the Independent Non-executive Directors of the Company have submitted their annual confirmation letters of 2021 in relation to their independence according to the requirements of the Listing Rules.

The Directors of the Company took the initiative to comply with the provisions of laws, administrative regulations and the Company's Articles of Association and actively fulfilled their duty of loyalty and diligence. Apart from regular and ad hoc meetings, the Directors of the Company obtained adequate information through the Chairman office meetings and the President office meetings in a timely manner in order to monitor the objectives and strategies of the management, the Company's financial position and operating results and the execution and implementation of provisions of material agreements. The Directors of the Company reviewed corporate briefings and other data on a regular basis to learn about the production and operation of the Company. The Independent Directors provided opinions and suggestions on operation and management for the Company via on-site survey. The specific committees under the Board proactively performed their duties and made suggestions and proposals for the development of the Company, which provides grounds for the Board to make correct decisions.

During the period when the Board was not in session, the Chairman discharged part of the duties of the Board of Directors, including (1) to examine and approve the establishment or cancellation of proposals to develop construction projects; (2) to examine and approve the proposals of the President in relation to the appointment, removal and transfer of managers of various departments of the Company and managers of external branches; (3) to examine and approve plans on the use of significant funds; (4) to examine and approve proposals on the establishment or cancellation of branch or branch organs; (5) to examine and approve other major issues.

The Board has summarized work for the past year and, in doing so, considered the opinions of the Supervisory Committee and the management. It believes that it has effectively fulfilled its duties and protected the interests of the Company and its shareholders.

The Directors who attended the 2020 Annual General Meeting of the Company held on 22 June 2021 were Zhao Keyu (Chairman, chief member of the Strategy Committee of the Tenth Session of the Board of Directors), Zhao Ping (Director), Huang Jian (Director), Li Haifeng (Director), Lin Chong (Director), Xu Mengzhou (independent Director, chief member of the Remuneration and Appraisal Committee of the Tenth Session of the Board of Directors), Xu Haifeng (independent Director) and Zhang Xianzhi (independent Director, chief member of the Audit Committee of the Tenth Session of the Board of Directors). The Directors who attended the 2021 First Extraordinary General Meeting of the Company on 16 November 2021 were Zhao Keyu (Chairman, chief member of the Strategy Committee of the Tenth Session of the Board of Directors), Zhao Ping (Director), Huang Jian (Director), Lu Fei (Director) and Xu Haifeng (independent Director). The Directors who attended the

2021 Second Extraordinary General Meeting of the Company on 22 December 2021 were Zhao Keyu (Chairman), Zhao Ping (Director), Xu Mengzhou (independent Director, chief member of the Remuneration and Appraisal Committee of the Tenth Session of the Board of Directors) and Xu Haifeng (independent Director).

(D) CHAIRMAN AND PRESIDENT

The Company shall have a Chairman and a President who shall perform their duties respectively according to the Articles of Association. Mr. Zhao Keyu acts as the Chairman of the Company and Mr. Zhao Ping acts as the Director and the President of the Company.

The division of duties of the Board and the senior management is the same as what has been disclosed in previous Corporate Governance Reports.

(E) NON-EXECUTIVE DIRECTORS

According to the provisions of the Articles of Association, the term of office of members of the Board of the Company shall not exceed three years (inclusive of three years) and the members are eligible for re-election. However, the term of office of Independent Non-executive Directors shall not exceed six years (inclusive of six years) according to the relevant provisions of the CSRC.

The respective terms of office of the non-executive Directors are as follows:

Names of non-executive Directors	Term of office
Huang Jian	2008.8.27-2022
Wang Kui	2020.6.16-2022
Lu Fei	2020.6.16-2022
Teng Yu	2020.6.16-2022
Mi Dabin	2014.9.18-2022
Li Haifeng	2020.12.22-2022
Cheng Heng	2017.6.13-2022
Lin Chong	2017.6.13-2022

(F) DIRECTORS' REMUNERATION

According to the relevant laws of the PRC and the relevant provisions of the Articles of Association, the Board of the Company has established the Remuneration and Appraisal Committee. The committee operates normally under the Detailed Rules on the Work of the Remuneration and Appraisal Committee and is mainly responsible for studying the appraisal standards of the directors and senior management personnel of the Company, conducting appraisals and making proposals; responsible for studying and examining the remuneration policies and proposals of the directors and senior management personnel of the Company. The total payroll, after examination by the Remuneration and Appraisal Committee, will then be submitted to the Board of Directors. The executive Directors have entered into the director's service contracts in compliance with the requirements of the Hong Kong Stock Exchange.

Members of the Tenth Session of the Remuneration and Appraisal Committee comprised of seven directors. Members of the Remuneration and Appraisal Committee are Mr. Xu Mengzhou, Mr. Zhao Ping, Mr. Cheng Heng, Mr. Li Haifeng, Mr. Liu Jizhen, Mr. Zhang Xianzhi and Mr. Xu Haifeng, of whom Mr. Xu Mengzhou, Mr. Liu Jizhen, Mr. Zhang Xianzhi and Mr. Xu Haifeng are independent non-executive Directors. Mr. Xu Mengzhou acts as the Chief Member.

The operation of the Remuneration and Appraisal Committee under the Board of Directors properly follows the Detailed Rules on the Work of the Remuneration and

CORPORATE GOVERNANCE REPORT

Appraisal Committee. The first meeting for 2021 was convened on 22 March 2021, at which the Report of Total Payroll of the Company was heard and the Company's arrangement for the total payroll for 2021 was approved. In the new financial year, the Remuneration and Appraisal Committee will carry out its work in a timely manner pursuant to the above rules on work according to the actual situation.

During the Reporting Period, the attendance of meeting of the Remuneration and Appraisal Committee of the Board was as follows:

Name of meeting	Date of meeting	Members who attended the meeting in person	Members who attended the meeting by proxy
2021 First Meeting of the Remuneration and Appraisal Committee of the Tenth Session of the Board of Directors	2021.3.22	Xu Mengzhou, Zhao Ping, Cheng Heng, Li Haifeng, Liu Jizhen, Zhang Xianzhi, Xu Haifeng	/

(G)NOMINATION OF DIRECTORS

According to the relevant laws of the PRC and the relevant provisions of the Articles of Association, the Board of the Company has established the Nomination Committee. The Committee operates normally under the Detailed Rules on the Work of the Nomination Committee and is mainly responsible for studying the selection standards and procedures for candidates for directors and senior management personnel of the Company according to the directors' qualifications under the Company Law and Securities Law and the needs of the operational management of the Company, and making proposals thereon to the Board; searching for qualified candidates for directors and suitable persons for senior management personnel on a wide basis; and examining the candidates for directors and suitable persons for senior management personnel and making proposals thereon. In order to achieve sustainable and balanced development, the Company has formulated the Board Member Diversity Policy. According to the relevant regulations, when determining the composition of the Board, the Company will consider the diversity of board members from multiple perspectives, including but not limited to gender, age, culture and educational background, professional experience, skills, knowledge and service tenure. The nomination of Directors by the Board shall be based on competence only, taking into account the diversity requirements of Board members. Currently, the composition of the Board members of the Company is reasonable and meets relevant regulatory requirements. The nomination of the candidates of directors of the Company is mainly made by the shareholders. The nominations, after examination of the relevant qualification by the Nomination Committee, will be submitted to the Board of Directors. The President of the Company is appointed by the Board and the candidates for the Vice President and other management are nominated by the President. Such nominations, after examination of the relevant qualification by the Nomination Committee, will be submitted to the Board of Directors for approval.

The Nomination Committee of the Tenth Session of the Board of Directors comprises of 7 members: Mr. Liu Jizhen, Mr. Zhao Keyu, Mr. Mi Dabin, Mr. Lin Chong, Mr. Xu Mengzhou, Mr. Zhang Xianzhi and Mr. Xia Qing, of whom Mr. Liu Jizhen, Mr. Xu Mengzhou, Mr. Zhang Xianzhi and Mr. Xia Qing are independent non-executive Directors. Mr. Liu Jizhen acts as the Chief Member.

(H) AUDITORS' REMUNERATION

For the year of 2019, 2020 and 2021, Ernst & Young was appointed as the Company's Hong Kong auditor, and Ernst & Young Hua Ming LLP was appointed as the Company's domestic auditor and U.S. 20-F annual auditor, respectively. The audit fees, audit-related fees, tax compliance services fees and other fees for the twelve months ended 31 December 2021 were RMB28.73 million, RMB1.77 million, RMB0.51 million and RMB0.50 million, respectively.

(I) AUDIT COMMITTEE

According to the requirements of the regulatory authorities of the jurisdictions where the Company is listed and the relevant provisions of the Articles of Association, the Board of Directors of the Company has established the Audit Committee which operates normally under the Detailed Rules on the Work of the Audit Committee and is mainly responsible for assisting the Board of Directors in supervising: (1) the authenticity of the financial statements of the Company; (2) the compliance by the Company with laws and regulatory requirements; (3) the qualification and independence of the independent auditors of the Company; (4) the performance of the independent auditors and the internal audit department of the Company; and (5) the control and management of the related transactions of the Company.

The Audit Committee under the Board of the Company holds four regular meetings per annum and has at least two separate meetings with the external auditors of the Company to hear reports on audit plans, work arrangements, audit results, etc. The Board formulates the Management Measures on Hotlines and Mailboxes for Informants, pursuant to which the Audit Committee is responsible for the management of the informants' hotlines and mailboxes.

Members of the Audit Committee of the Tenth Session of the Board of Directors comprises of five independent non-executive Directors, namely Mr. Zhang Xianzhi, Mr. Xu Mengzhou, Mr. Liu Jizhen, Mr. Xu Haifeng and Mr. Xia Qing respectively. Mr. Zhang Xianzhi acts as the Chief Member.

During the Reporting Period, the Audit Committee held eight meetings. As per Audit Committee's duties, the Audit Committee interviewed with the Company's legal advisors, external auditors, management and the relevant departments separately and exchanged ideas and communicated with them. With the understandings on the applicable laws and regulations of those jurisdictions in which the shares of the Company are listed, anti-fraud position in the Company, recruitment of staff, implementation and execution of internal control mechanism, audit work carried out by external auditors, and the preparation of the financial statement, the Audit Committee has rendered their views and opinions and made certain proposals.

During the Reporting Period, the attendance of meetings of the Audit Committee was as follows:

Name of meeting	Date of meeting	Members who attended the meeting in person	Members who attended the meeting by proxy
2021 First Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.2.26	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2021 Second Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.3.22	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng	Xia Qing
2021 Third Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.4.26	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/

CORPORATE GOVERNANCE REPORT

Name of meeting	Date of meeting	Members who attended the meeting in person	Members who attended the meeting by proxy
2021 Fourth Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.7.26	Zhang Xianzhi, Xu Mengzhou, Xia Qing	Liu Jizhen, Xu Haifeng
2021 Fifth Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.9.13	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2021 Six Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.9.27	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2021 Seventh Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.10.25	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2021 Eighth Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2021.11.2	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/

(J) RESPONSIBILITY ASSUMED BY THE DIRECTORS IN RELATION TO THE FINANCIAL STATEMENTS

The Directors of the Company confirm that they shall assume the relevant responsibility in relation to the preparation of the financial statements of the Company, ensure that the preparation of the financial statements of the Company complies with the relevant regulations and applicable accounting standards and also warrant that the financial statements of the Company will be published in a timely manner.

The reporting responsibility statements made by the auditors of the Company in relation to the financial statements of the Company are set out in auditor's reports on pages 105 to 111.

(K) SENIOR MANAGEMENT'S INTEREST IN SHARES

None of the senior management of the Company holds any shares of the Company.

(L) STRATEGY COMMITTEE

According to the requirements of regulatory authorities of the jurisdictions where the Company is listed and the requirements of the Company's Articles of Association, the Board of Directors of the Company set up the Strategy Committee. The Strategy Committee operates normally under the Detailed Rules on the Work of the Strategy Committee and mainly takes the following responsibilities: (1) to study and make suggestions on the Company's long-term development strategies and plans; (2) to study and make suggestions on material investment and financing proposals which require the approval of the Board of Directors; (3) to study and make suggestions on material production and operational decision- making projects which require the approval of the Board of Directors; (4) to study and make suggestions on other material matters that will impact the Company's development; (5) to

monitor the implementation of the above matters; (6) to be responsible for the Company's overall risk management and improve the Company's overall anti-risk ability; and (7) other matters required by the Board of Directors.

Members of the Strategy Committee of the Tenth Session of the Board of Directors comprises of seven directors, namely, Mr. Zhao Keyu, Mr. Zhao Ping, Mr. Huang Jian, Mr. Wang Kui, Mr. Lu Fei, Mr. Liu Jizhen, Mr. Xu Haifeng, of whom Mr. Liu Jizhen and Mr. Xu Haifeng are independent non-executive Directors. Mr. Zhao Keyu acts as the Chief Member.

On 20 August 2021, the Strategy Committee considered and approved the Comprehensive Risk Management Report of Huaneng Power International, Inc..

The risk management work operates effectively and in an oderly manner to cover all kinds of risks, thus continuously strengthening and improving the internal control and risk management mechanism of the Company.

During the Reporting Period, the attendance of meetings of the Strategy Committee was as follows:

Name of meeting	Date of meeting	Members who attended the meeting in person	Members who attended the meeting by proxy
2021 First Meeting of the Strategy Committee of the Tenth Session of the Board of Directors	2021.8.20	Zhao Keyu, Zhao Ping, Huang Jian, Wang Kui, Lu Fei, Liu Jizhen, Xu Haifeng	/

(M)TRAININGS FOR DIRECTORS AND SENIOR MANAGEMENT

In 2021, the Directors, Supervisors and senior management attended more than 40 trainings, including 5 trainings of follow-up training for independent directors of the Shanghai Stock Exchange, 29 special trainings for directors and supervisors arranged by regulatory authorities; the Chairman, President and other executives actively participated in important meetings such as the special trainings for state-owned listed companies arranged by the State-owned Assets Supervision and Administration Commission, the annual and mid-year supervisory work meetings organized by the CSRC Beijing Regulatory Bureau, and the bond and asset securitization business supervision meetings; the Board Secretary attended six trainings of enhanced continuing professional development arranged by the Hong Kong Chartered Governance Institute. All Directors, Supervisors and senior management took the initiative to comply with laws, regulations and the Articles of Association of the Company, and took the lead in "Hold Reverence, Defened Integrity" to provide guarantee for the continuous improvement of corporate governance.

For every six months, the Company holds a meeting where legal counsels of all three listing jurisdictions meet with the Audit Committee, make presentations to all the Independent Directors of the Audit Committee about latest updates on regulatory requirements, application of the Company's corporate systems and rules and the compliance by the Company with regulations of the listing places.

CORPORATE GOVERNANCE REPORT

According to the records provided by the Directors and Supervisors, we set forth below a summary of the trainings received by the Company's Directors and Supervisors during the period from 1 January 2021 to 31 December 2021:

Name of Director/Supervisor	Type of continuing professional development plan
Zhao Keyu	A, B
Zhao Ping	A, B
Huang Jian	A, B
Wang Kui	A, B
Lu Fei	A, B
Teng Yu	A, B
Mi Dabin	A, B
Li Haifeng	A, B
Cheng Heng	A, B
Lin Chong	A, B
Xu Mengzhou	A, B
Liu Jizhen	A, B
Xu Haifeng	A, B
Zhang Xianzhi	A, B
Xia Qing	A, B
Li Shuqing	A, B
Mu Xuan	A, B
Xi Aidong	A, B
Gu Jianguo	A, B
Xu Jianping	A, B
Zhu Tong	A, B

Notes:

A: Attending briefings and/or seminars.

B: Reading seminar materials and updates on the latest developments of the Listing Rules and other applicable regulatory requirements.

All the Directors and Supervisors must submit their training records to the Company on a quarterly basis. The Company Secretary will keep the records for regular inspections. Each of the Directors and Supervisors of the Company have received more than 15 hours of trainings in 2021.

The Company attaches great significance to the training and continuing professional development of its senior management personnel, and actively attends all kinds of training programs held by relevant State authorities, industry administrative authorities and associations.

(N) TO CONVENE EXTRAORDINARY BOARD MEETINGS

An extraordinary Board meeting may be held at the request of any shareholders representing one tenth or more of the voting rights of the Company. The Chairman shall, within ten days upon receipt of such request, convene and chair such meeting.

(O) TO MAKE ENQUIRIES TO THE BOARD

The shareholders shall have access to the relevant information of the Company in accordance with the provisions of the Articles of Association, including the Articles of Association of the Company, the share capital, the minutes of shareholders' meetings and the resolutions of Board meetings and meetings of the Supervisory Committee.

(P) INSURANCE FOR DIRECTORS

The Company has renewed its Directors' Liability Insurance policy of US$10 million in 2021.

(Q) COMPANY SECRETARY

Mr. Huang Chaoquan has been acting as the Company Secretary of the Company under the Hong Kong Listing Rules since 22 May 2017, whose resume is set out in the section headed "Profiles of Senior Management". During the Reporting Period, Mr. Huang Chaoquan has complied with relevant professional training requirements under Rule 3.29 of the Hong Kong Listing Rules.

(R) MAJOR CHANGES IN THE ARTICLES OF ASSOCIATION

Nil.

SOCIAL RESPONSIBILITY REPORT

The Board of Directors of the Company and all the directors thereof guarantee that this report does not contain any false statement, misleading representation or material omission, and jointly and severally accept responsibilities as to the truthfulness, accuracy and completeness of the content of this report.

This report systematically summarizes the works of Huaneng Power International, Inc. (the "Company") in 2021 in fulfilling its social responsibilities, with a view to giving a true presentation of the Company's concrete achievement in promoting comprehensive, healthy and sustainable development in 2021.

This report has been prepared in accordance with the "Guidelines on Preparation of Corporate Report on Performance of Social Responsibilities" issued by the Shanghai Stock Exchange, and with reference to the "G4 Sustainable Development Reporting Guidelines" issued by Global Reporting Initiative (the "GRI") and the actual performance by the Company.

I. CORPORATE OVERVIEW AND CORPORATE GOVERNANCE

1. Corporate Overview

Incorporated on 30 June 1994, the core business of the Company is to develop, construct and operate power plants throughout China by making use of modern technology and equipment and financial resources available domestically and internationally, and the Company is one of the largest listed power companies in China and the first power company in China listed in three stock exchanges.

Over the years, the Company conscientiously fulfilled its operation responsibility, safety responsibility, environment responsibility, staff responsibility and social responsibility. With the mission of "three colors company", the Company was committed to providing adequate, reliable and eco-friendly power and high-quality energy services for the community, as well as to system, technology and management innovations. The Company was the pioneer and has created various milestones within the domestic power industry in areas such as power technology advancement and power plant construction and management, which facilitated the great-leap forward development of the power business and technological advancement of the power station equipment manufacturing industry in China, and also contributed to the improvement of technical and management standards of domestic power generation enterprises.

As of 31 December 2021, the Company had a controlled generation capacity of 118,695 MW. The Company has power plants located in 26 provinces, autonomous regions and municipalities directly under the Central Government of the PRC, wholly owns a power company in Singapore and invests in a power company in Pakistan.

2. Corporate Governance

Adhering to the leadership of the Communist Party of China, and guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, the Company constantly strengthened the Party building, solidified the foundation of Party building at the grassroots level, deeply promoted the fine Party culture and a corruption-free Party building, fully relied on the masses and workers, and led high-quality development with high-quality Party building.

As a public company listed in three stock exchanges at home and abroad, the Company was subject to regulations of security regulatory authorities of the three domestic and overseas places of listing, and supervision from its investors. In accordance with the requirements of the modern enterprise system, the Company have established and improved a corporate governance system consisting of the shareholders' general meeting, the Board, the Supervisory Committee, and senior management 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, as well as the smooth implementation of operation and management of senior management.

After years of exploration and practice, the Company has built up a normal, effective and sound corporate governance system that caters for the development of the Company. The Company regularly evaluated the applicability and effectiveness of the management system and revised and improved it in a timely manner to achieve dynamic maintenance of the system.

The Company insisted on carrying out high-quality information disclosure, actively responded to regulatory inquiries and investor concerns, and completed 360 information disclosures without errors throughout the year. The Company was awarded "A" grade rating for information disclosure by the Shanghai Stock Exchange, the Golden Bauhinia Award for the "Best Listed Company" by the China Securities, and "Top 50 Outstanding Listed Company for the Year" by Interface News. The Company published regular reports, sustainability reports, and ESG reports of high quality. The release of the Company's 2020 annual sustainability report was reported by important energy media such as "Learning Power" APP, China Electric Power News and China Electric Power. The Company's ESG reports were selected as an excellent practice case for listed companies. The Company won high recognition from regulators and the capital market for its good image of regulation and integrity, professionalism and transparency, and respect for shareholders. In 2021, the Company's A Shares price hit a new high of nearly six years and its market value doubled.

II. OPERATION RESPONSIBILITY OF THE COMPANY

The Company was committed to building a world-class listed power company, making every effort to make progress in a stable manner, focusing on marketing, cost reduction and cost control, cultivating overseas markets, and creating value for shareholders with lean and professional management.

The Company's energy supply has demonstrated its corporate responsibility. In 2021, in the face of the complex situation of the continued impact of the epidemic, high fuel prices and tight power supply, the Company resolutely implemented the spirit of General Secretary Xi Jinping's important instructions, took responsibility and initiative, resolutely carried the political responsibility of energy supply, and gave full play to the "pillar" and "cornerstone" role of a state-owned enterprise. The Company set up a leading group to ensure supply, formulated a work plan to ensure supply, adjusted the budget in a timely manner, raised funds to ensure supply, strengthened the monitoring of unit output, accelerated the pace of project commissioning, without coal shortage shutdown or capital disruption, and ensured the safety of regional energy consumption.

The Company's lean marketing has witnessed the increase in quantity and price. The Company strengthened market research and judgment, refined marketing strategies and made efforts to increase the generation of efficient electricity. The Company coordinated the quantity and price of coal-fired units, optimized the timing of gas-fired units, and made every effort to generate more and full capacity of new energy units. The total power generation capacity of domestic power plants for the year was 457.3 billion KWh, representing a year-on-year increase of 13.2%. The Company studied the power market policy in depth and made every effort to seek policy support to promote the increase of trading tariff and the re-signing and renewal of annual long-term contract, and the Company's domestic average tariff saw a year-on-year increase of RMB18.25/MWh. The Company took the initiative to adapt to the power market reform, actively participated in the trial run of the power spot market and improved the level of spot bidding. The Company stepped up efforts to explore electric heat users and made efforts to increase the settlement heat price. The Company completed the annual heat supply of 297 million GJ, representing a year-on-year increase of 12.64%, and the heat supply price increased by 7.1% year-on-year.

The Company's cost control was strong and effective. The Company closely tracked the changes in the coal market, coordinated the control of fuel price and quantity, strengthened the fulfillment of long-term contracts, and the

SOCIAL RESPONSIBILITY REPORT

fulfillment rate of tripartite mutual guarantee agreement between production, transportation and demand was over 90%. The Company also optimized the debt maturity structure, seized the market window and issued the first batch of carbon neutral bonds and energy security bonds totaling RMB58.3 billion. The Company's comprehensive cost of interest-bearing debts saw a year-on-year decrease of 20 basis points, resulting in annualized interest expense savings of nearly RMB600 million.

The Company's overseas project management has been continuously improved. The Company thoroughly implemented the Belt and Road Initiative and developed its international business with high quality, and its overseas projects continued to operate well, with total profit seeing a year-on-year increase of 7.3%. Tuas Power Ltd. in Singapore continued to optimize its business strategy, pushing the recovery of price of the power pool and obtaining the unit reliability incentive in full, and the Singapore business achieved a pre-tax profit of RMB163 million, representing a year-on-year increase of 18.9%. The Sahiwal project in Pakistan coordinated the prevention and control of epidemic and production management, refined fuel management, capital management, tax relief and other work, and strictly controlled the costs and expenses, and the total profit before tax of Pakistan business increased by 5.1% year-on-year.

III. SAFETY RESPONSIBILITY OF THE COMPANY

The Company has always prioritized safety development. We established the safety concept that "safety is credibility, safety is efficiency, safety is competitiveness, and safety responsibility is of the utmost importance", and made every effort to ensure safe and stable power supply to the society and the power grid. The Company attaches great importance to the personal safety and occupational health of employee. We strengthened safety awareness and provided proper safety protection to effectively ensure safe production.

The Company consolidated and strengthened safety foundation. The Company implemented the three-year plan for special rectification of safety production and the plan of 100-day fight to ensure the safety, deepened the inspection and evaluation of the implementation of the work safety responsibility system, and promoted the "five checks and five strictness" for risks and hidden dangers, so that the safety management standard was further improved. The Company focused on the management of outsourced infrastructure projects and anti-violation management, carried out on-site safety inspections such as "Field Investigation without Notice and Report", completed risk and hidden danger investigation and problem rectification, and achieved "zero accident" in infrastructure. The Company successfully dealt with extreme weather and natural disasters, and provided safety services for important events such as the CPC's Founding Anniversary. The Company completed the task of "HA2021" defense, and strengthened the foundation of network security.

The Company continued to strengthen the safety of equipment. The Company carried out in-depth work on "control of non-planned stop", and, focusing on "control of non-planned stop", improved the safety management, equipment management and production management of power plants and enhanced the awareness of safety responsibility system implementation. The Company studied and analyzed the anti-non-planned stop strategy, strengthened the whole process control of unit operation and maintenance, and continuously improved the level of equipment reliability.

The Company did a good job on normalized epidemic prevention and control. The Company always put the safety and health of its employees in the first place, refined and implemented various measures at all levels, effectively responded to the sudden outbreak of the epidemic at several places in China, conducted the prevention and control of the epidemic for overseas projects, intensified the prevention and control work, firmly guarded the Company against the impact of the epidemic, and realized the success of epidemic prevention and control and production and operation development of the Company.

IV. ENVIRONMENT RESPONSIBILITY OF THE COMPANY

The Company thoroughly implemented the new development concept, and thoroughly implemented the new energy safety strategy of "Four Revolutions, One Cooperation" to vigorously promote quality transformation, efficiency transformation, and driver transformation. Guided by the carbon peak and carbon neutral targets, the Company formulated the 14th Five-Year Plan and the carbon peak action plan, optimized the green development path, intensified the transformation and upgrading of coal power, accelerated the pace of development of new energy projects, promoted indepth scientific and technological innovation, continuously improved the level of greenhouse gas management technology, and contributed the Company's strength to the harmonious development of human and nature.

The Company promoted the transformation and upgrading of coal power. The Company developed clean and high-efficiency coal-fired power projects in a scientific manner, and provided strong support for meeting the requirements for supporting peak regulation of new energy power generation and ensuring stable regional energy supply. Two 1,000 MW high-efficiency ultra-supercritical secondary reheat generating units was built in the Ruijin Power Plant Phase II Project, which are the first batch of the National Energy Administration's major technology demonstration projects for the first (set) national production of safe and smart DCS/DEH integration in the energy sector. Meanwhile, they were equipped with ultra-clean emission environmental protection equipment, becoming a smart benchmark for clean, safe and efficient coal-fired power plants in China. The Company actively promoted the transformation of thermal power projects from coal-fired to multi-fuel, Zhaodong Biomass Project obtained the approved tariff for renewable energy, and three units including Rizhao Power Plant completed multi-fuel coupling and blending transformation. The Company orderly promoted the upgrading and renovation of coal power units with the principle of "Synergistic Renovation in three Aspects", continuously improved the level of clean, efficient and flexible technology, and completed the long-distance heating renovation of Jiutai Power Plant, the energy-saving renovation of nine units including Jinling Power Plant, and the flexibility renovation of three units including Nantong Power Plant.

The Company was deeply engaged in the development of new energy sources. The Company stepped up power supply structure adjustment, carried out in-depth "zero carbon emission" power generation project reserve and development, and steadily increased the installed capacity of new energy. The Company completed the approval (filing) of 28,730 MW of new energy projects for the year, exceeding the annual target. The Company started the construction of new energy installed capacity of 4,680 MW and put 3,200 MW into operation, and the proportion of new energy installed capacity increased by 2.3 percentage points year-on-year. The scale of the Company's offshore wind power grew steadily. Dalian Zhuanghe Offshore Wind Farm, the largest single offshore wind power project in northern China with the highest latitude, was connected to the grid at full capacity, providing Huaneng solutions for the construction of high-latitude offshore wind farms. The Company completed the No. 4 Offshore Wind Farm in Shandong Peninsula South, helping Shandong Province to achieve a "zero" breakthrough in offshore wind power. Jiangsu Guanyun, Sheyang and Qidong offshore wind power projects are of great significance to promote the transformation and upgrading of local energy structure and the high-quality development of offshore wind power. The Company continuously optimized the photovoltaic layout, built and put into operation the world's largest floating PV power station with the largest single capacity – Huaneng Dezhou Dingzhuang Water PV Power Station, together

SOCIAL RESPONSIBILITY REPORT

with the completed onshore wind power project and energy storage device in Dingzhuang, to realize "wind, photovoltaic and electricity storage in the same field". Zhejiang Yuhuan Power Plant has built Qinggang PV Power Station, the first intertidal PV power station in China. With the special scheme of ecological protection, it has achieved three-dimensional carbon reduction, becoming the first PV power station with blue carbon pool for ecological management of coastal tidal flat in China, and demonstrating the large-scale green development of coastal tidal flat.

The Company solidly carried out green and clean production. The Company focused on fine management of energy conservation of power generation units and rating of power generation units, so as to improve the level of creating excellent energy efficiency. The Company effectively carried out environmental risk investigation and rectification, and strengthened ecological and environmental risk control. The Company ensured air quality protection during key hours to show the green image of Huaneng. In 2021, the coal consumption of the Company's thermal power units was 290.69g/KWh, and the house consumption rate was 4.34%. The Company led the industry in major energy consumption and environmental protection indicators.

The Company made remarkable achievements in scientific and technological innovation. In the Ruijin Power Plant Phase II Project, the first set of national production control and information system (DCS/DEH+SIS) in China was completed and put into operation, while the hyper-converged integrated edge cloud was put online to support the four application systems of smart safety, smart operation, smart inspection and smart marketing, which significantly improved the intelligent level of operation and management in actual production process of power plant. The National Key Research and Development Program project of "new type of high alkali coal liquid slag boiler technology" passed the acceptance of the Ministry of Science and Technology. The construction of smart power plant in Shidongkou I Power Plant was progressing steadily, and the smart infrastructure management system won the first prize of smart site management in electric power construction project. In 2021, the Company obtained 2,445 patents, including 80 invention patents. The Company completed 28 PCT patent applications, 20 patent applications from the United States, Japan and Europe, and 5 international patent authorizations, exceeding the annual target of intellectual property rights.

The Company improved the management level of greenhouse gas. The Company made solid efforts to measure and verify greenhouse gas emission data. The Company strengthened the study of carbon emission reduction policy and actively participated in the construction of carbon market. The Company formulated carbon trading work responsibilities and processes, established a management mechanism adapted to the Company's carbon trading, and made adequate preparations for full compliance. In 2021, the Company actively participated in carbon market trading and achieved full compliance at low cost and surplus allowances, laying a solid foundation to help achieve the goal of carbon peak and carbon neutrality.

V. STAFF RESPONSIBILITY OF THE COMPANY

With the belief that "elites are the forefront important assets", the Company has carried out the Party's organizational line in the new era, stuck to the correct direction of selection and employment of personnel, and actively promoted the strategy of developing the enterprise by talents. Focusing on the development of the Company's business, the Company continuously improved the human resource management system, and accelerated the development of a talent team with senior-level talents and highly skilled talents as the main body. As a result, 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, has been formed.

The Company protected the rights and interests of employees in all aspects. The Company insisted on a fair, just and open employment

policy, implemented the Labor Contract Law, the Labor Union Law and other laws and regulations, improved the system requirements such as staff representative meeting and plant affairs publicity, encouraged and supported employees to participate in democratic management, protected employees to fully enjoy the right to information, participation and supervision, continuously improved and deepened the construction of salary distribution system, established various social insurance and housing provident fund in accordance with the law, paid the fees in full and on time, protected employees' social welfare treatment, safeguarded employees' legitimate rights and interests and realized the enterprise development goal together with employees.

The Company promoted staff development through multiple channels. The Company deeply promoted the practical experience and professional training of employees, increased the efforts of communication from top to bottom of the Company, actively expanded the development channels of employees and enhanced the practical training of employees. Meanwhile, it enriched the performance experience and broadened the growth channels, improved the staff learning platform, set up learning teams, promoted the dual-channel promotion mechanism, promoted the growth of technical talents, developed new modes of online training, organized staff to participate in multi-level and multi-disciplinary training in political theory, management knowledge and business skills, and practically cultivated and trained employees in all aspects through job training, multi-level training, etc. to enhance their comprehensive ability, enrich work experience and improve the ability to manage complex situations, so as to build a good platform for the growth of personnel.

VI. SOCIAL RESPONSIBILITY OF THE COMPANY

Under the guidance of the "three colors" culture, the Company adhered to the harmonious development concept of "serving the country, benefiting society, seeking multi-win results and common growth", integrated into the development of the community, and worked together with stakeholders to promote social prosperity and progress. The Company actively implemented the help and assistance policy of the state and strove to promote the development of rural revitalization. In the face of major public emergencies, the Company implemented the deployment requirements of the CPC Central Committee to provide sufficient energy supply and economic support for China. The Company took the initiative to give back to the society and carried out various public welfare activities to help the people achieve a better life. In 2021, the Company was awarded the title of "Top 500 Chinese Enterprises in Philanthropy in 2021".

The Company concentrated its efforts on helping and assisting. In accordance with the deployment requirements of the CPC Central Committee and the State Council on effective connection of consolidating and expanding the achievements of poverty alleviation with rural revitalization, the Company made solid efforts to continue the supporting policies and mechanism in the new stage, and scientifically formulated specific measures to consolidate and expand the achievements of poverty alleviation and effectively promoted the implementation of the national rural revitalization strategy in 2021. The Company summarized the experience of poverty alleviation, adjusted and optimized supporting measures by category in light of the development needs of the supporting regions, and carried out targeted supporting and assistance work in respect of industry, consumption, education, infrastructure, etc. The Company took advantage of its main business and invested in the construction of centralized, agricultural and fishery PV projects, taking into account the characteristics of the resources in the poverty-stricken areas, to solve the difficulties of local electricity consumption and boost local economic growth. The Company strengthened the support of special industries and public infrastructure construction, improved the education, medical and housing conditions of local people and promoted the sustainable development of villages, with a total investment of more than RMB10 million throughout the year. The Company united its corporate efforts to

SOCIAL RESPONSIBILITY REPORT

continue to vigorously implement consumer support, organize online and offline multi-channel procurement of supporting products, adopt new forms such as livestreaming marketing, and carry out supporting sales activities, with a total purchase of more than RMB50 million of agricultural products in the supported areas throughout the year.

The Company united its efforts to fight the epidemic. In 2021, the situation of prevention and control of the epidemic at home and abroad remained complicated and volatile. The Company resolutely implemented the decisions and deployments of the state on combating the epidemic, scientifically coordinated the production and operation as well as the prevention and control of the epidemic, maintained "zero infection" in the Company, and provided strong energy security for all regions continuously. After the outbreak of the epidemic in Zhuanghe City, Dalian, Liaoning Clean Energy made every effort to ensure the stable order of the construction and production of the project, actively supported the local government in purchasing epidemic prevention materials, and organized donations of nearly RMB2 million, demonstrating the responsibility of Huaneng "Red Company" with practical actions. The Company attached great importance to the prevention and control of the epidemic for overseas projects, strictly implemented preventive and control measures at all levels, and strengthened the medical service guarantee for overseas employees. The Sahiwal Power Station witnessed a long period of safe and stable operation, supporting the economic development and improvement of people's livelihood in Pakistan. Tuas Power Ltd. in Singapore earnestly fulfilled its social responsibility and provided anti-epidemic assistance to Indian Red Cross Society through Singapore Red Cross Society.

The Company went all out to fight the flood and provide disaster relief. In the face of the extraordinarily heavy rainfall disaster in Henan Province, the Company launched the emergency response at the first time, investigated the safety hazards of production equipment and ensured the safe and stable supply of power and heat sources. In close coordination with the local government, the Company took the initiative to participate in the anti-flood rescue operation and make every effort to protect people's lives and properties. The Company actively organized rescue donations, and Henan Branch and other subsidiaries donated a total of more than RMB2 million money and materials to contribute to flood control and disaster relief.

The Company was engaged in public welfare to convey warmth. The Company built a volunteer service platform, mobilized all employees to participate extensively, organized various public welfare activities such as education, medical care and environmental protection, and delivered love and warmth to the society. The Company's overseas enterprises practiced the concept of social responsibility and participated in many local public welfare projects, reflecting the principle of mutual discussion, co-construction and sharing. For many years, Tuas Power Ltd. in Singapore has contributed to the development of local public welfare projects such as child welfare support and food welfare improvement, which has won wide acclaim from the society.

In the future, the Company will continue to work together with all stakeholders and make continuous and strenuous efforts to achieve sustainable development, provide more and more stable clean energy for the development of the country, assume a stronger and more determined responsibility for the good life of the people, and greet the success of the 20th CPC National Congress with practical actions and outstanding achievements.

INVESTOR RELATIONS

PHILOSOPHY OF INVESTOR RELATIONS

Huaneng International has always highly valued the management of investor relations since its listing. The Company communicates with all investors in a wholehearted, equal and respectful manner through timely and diversified two-way channels, enhancing and perfecting the management of investor relations of the Company. In addition, the Company also values the two-way interactive communication of "disclosure" and "adoption". As to "disclosure", the Company discloses information including financial position and operating performance to investors accurately, fairly and comprehensively in a responsible manner, which helps investors to understand and recognize the current situation and future development strategy of the Company. As to "adoption", the Company makes ready various channels to collect opinions of investors to adopt suggestions and ideas related to its operating activities. Such two-way communication effectively improves the operation management ability of the Company and ultimately maximizes the interests of the Company and all shareholders as a whole.

MECHANISM OF INVESTOR RELATIONS

Establishing meticulous organization and enhancing system development

The Company sets up specific information disclosure organizations (Information Disclosure Committee and Information Disclosure Work Team) and holds routine information disclosure meetings every Monday, making clear the work flow for information disclosure of the Company and guaranteeing the compliance and time effectiveness of information disclosure.

In the meantime, the Company has established the "Measures on Information Disclosure Management", the "Measures on Related Transactions Management", the "Rules on Investor Relations Management", the "Detailed Rules on the Work of the Information Disclosure Committees", "Measures on Insider Information Management" and the "Regulations on Accountability for Significant Errors in Annual Report Information Disclosure", setting out in detail the basic principles, targets, procedures, contents of disclosure, registration and filing of insider information and related accountability. The promulgation and implementation of these regulations further enhanced the information disclosure system of the Company, strengthened the discipline of the Company's information disclosure, prevented and minimized the insider dealing activities, improved the authenticity, accuracy, completeness and timeliness of information disclosure, so as to protect the legal interests of shareholders.

In addition, the Company has also formulated the "Internal Control System" according to the relevant requirements of the state and Sections 302 and 404 of the "Sarbanes-Oxley Act of 2002", as well as prepared the "Internal Control Handbook", further enhancing our corporate governance and ensuring truthful, timely, accurate and complete information disclosure.

Having established a complete and effective control system targeting at the entire process of the Company's information disclosure, the Company has been able to control potential risks in information disclosure effectively and ensure that all information disclosed by the Company is regulated and effective since its listing. With its timely, accurate and sufficient information disclosure, the Company has been well recognized by domestic and overseas investors.

INVESTOR RELATIONS

Diversified channels and effective communication

In view of the different needs and nature of different investors – existing investors, potential investors, institutional investors and retail investors, the Company actively holds a variety of investor relations activities in various forms, including phone enquiries, emails, analyst conferences, one-on-one meetings, investment forums, roadshows and reverse roadshows, according to the characteristics of different investors, with a view to achieve all-round and effective communication and establish long-term and stable relations of mutual trust.

The Company insists on handling daily calls and visits made by investors properly. By consistently updating and sorting out the investor database, expanding the investor communication network of the Company, and holding two-way interactive investor relations activities, the Company is able to enhance the understanding and knowledge of investors about the Company, adopt suggestions and ideas put forward by investors, create two-way communication channels and platforms for smooth communication with investors and maximize the interests of the Company and investors.

Timely disclosure and continuous follow-up

The Company discloses its information in a truthful, accurate, complete and timely manner strictly according to the requirements of the regulatory authorities of its listing places, thereby increasing the transparency of and drawing market attention to the Company and enhancing the image of the Company in capital markets. In the meantime, the Company follows up feedbacks from investors consistently and ensures effective communication, with a view to establish stable investor relations.

The Company made 9 overseas press releases and issued 351 announcements within and outside China in 2021.

NOTE TO SHAREHOLDERS

Dividend distribution

According to the Articles of Association, the net profit attributable to shareholders of the Company in 2021 was negative, the Board recommended not to declare dividend in 2021 after taking into account the investment requirement for the transformation development of the Company, the rise of the gearing ratio of the Company in 2021 and other factors. Such proposal which has been considered and passed by the Board meeting and the Supervisory Committee will be submitted to the annual general meeting of the Company for consideration.

DIVIDEND DISTRIBUTION

The Company's Articles of Association clearly define the Company's cash dividend policy, i.e. when the Company's earnings and accumulative retained profits for the current year are positive, and on the condition that the Company's cash flow is able to meet the need for its ordinary operation and sustainable development, the Company shall adopt a cash dividend policy on the principle that the cash dividend payout shall be no less than 50% of the realized distributable profit stated in the consolidated financial statement that year.

In the future, the Company will continue to adhere to a proactive, balanced and stable dividend policy, persistently enhance its profitability, striving for realization of increasing returns to shareholders.

Declaration of dividends

Since the listing of the Company, shareholders have given great support to and cared much for the Company. The Company has also generated returns that have been growing continuously and steadily over the years. The Company has been paying dividends to shareholders every year since 1998, with an accumulated dividend of RMB62.687 billion paid.

Dividend Year	Dividend per share (RMB)	Earnings per share (RMB)	Payout ratio
1994		0.17	
1995		0.24	
1996		0.27	
1997		0.33	
1998	0.08	0.33	24.24%
1999	0.09	0.33	27.27%
2000	0.22	0.44	50.00%
2001	0.30	0.60	50.00%
2002	0.34	0.65	52.31%
2003*	0.50	0.90	55.56%
2004	0.25	0.44	56.82%
2005	0.25	0.40	62.50%
2006	0.28	0.50	56.00%
2007	0.30	0.51	58.82%
2008	0.10	-0.33	N/A
2009	0.21	0.41	51.22%
2010	0.20	0.28	71.43%
2011	0.05	0.08	62.50%
2012	0.21	0.39	53.85%
2013	0.38	0.74	51.35%
2014	0.38	0.76	50.00%
2015	0.47	0.94	50.00%
2016	0.29	0.56	51.79%
2017	0.10	0.10	100.00%
2018	0.10	0.03	333%
2019	0.135	0.01	1,350%
2020	0.18	0.04	450%
2021**	–	-0.81	N/A

* The Company's profit distribution plan for 2003 included a cash dividend of RMB5 together with bonus issue of 10 shares for every 10 shares.

** According to the Articles of Association, the net profit attributable to shareholders of the Company in 2021 was negative, the Board recommended not to declare dividend in 2021 after taking into account the investment requirement for the transformation development of the Company, the rise of the gearing ratio of the Company in 2021 and other factors. Such proposal which has been considered and passed by the Board meeting and the Supervisory Committee will be submitted to the annual general meeting of the Company for consideration.

INVESTOR RELATIONS

INVESTOR RELATIONS ACTIVITIES

Performance Recommendation

In 2021, under the special situation of COVID-19, the Company replaced the traditional on-site meeting with teleconference. The Company organized and convened a conference call for global investors with the theme on its 2020 annual results and the first quarterly results, interim results and the third quarterly results of 2021.

Investment forums and investor meetings

In 2021, the Company actively participated in investment forums and investor exchange activities held by domestic and overseas institutions on line and totally engaged in more than 12 online meetings with institution investors, with over 200 participants. The Company organized and participated in Group Reception Day Activity for Listed Companies in Beijing for 2021 and answered the questions of investors in details online, which achieved good communication effects.

Visits by and general enquiries from investors

The Company overcame epidemic difficulties and carried out daily investor relations maintenance in an orderly manner. The Company received more than 300 visits from investors and answered telephone inquiries. The Company paid attention to the SSE E-interactive platform in real time, timely replied to 105 questions from investors on the platform, promptly responded to investors' concerns about the Company's transformation and development and earnings return, strove to build mutual trust between the Company and small and medium-sized investors, and better protected investors' right to be informed.

REPORT OF THE BOARD OF DIRECTORS

The Directors hereby submit the annual report together with the audited financial statements for the year ended 31 December 2021.

RESULTS SUMMARY

The Board of Directors (the "Board") of Huaneng Power International, Inc. hereby announces the audited operating results of the Company and its subsidiaries for the year ended 31 December 2021.

For the twelve months ended 31 December 2021, the Company realized operating revenue of RMB204,605 million, representing an increase of 20.75% as compared with the same period last year. Net loss attributable to equity holders of the Company amounted to RMB10,636 million, representing a decrease of 547.27% as compared with the same period last year. Losses per share amounted to RMB0.81.

The Board proposed to declare no dividend for ordinary shares of the Company.

BUSINESS REVIEW OF YEAR 2021

In 2021, facing up to the risk of the COVID-19 epidemic and the market environment of significant price increase in the coal market, the Company made all-out efforts to coordinate the work of epidemic prevention and control, production and operation, and transformation and development, thus the safety production and supply of electric power and thermal power maintained stable, the pace of transformation and upgrading accelerated, and innovation made a new progress. We completed the major objectives of the year and continued to fulfill the responsibility of providing sufficient, reliable and eco-friendly energy to the community.

1. Operating Results

For the twelve months ended 31 December 2021, the Company realized operating revenue of RMB204,605 million, representing an increase of 20.75% as compared with the same period last year. Net loss attributable to equity holders of the Company amounted to RMB10,636 million, representing a decrease of 547.27% as compared with the same period last year. Losses per share amounted to RMB0.81.

As at the end of 2021, net assets per share of the Company amounted to RMB4.12, representing a decrease of 20.62% as compared with the same period last year.

The Audit Committee of the Company convened a meeting on 21 March 2022 and reviewed the 2021 annual results of the Company.

2. Power Generation

In 2021, with the principle of maximization of the overall interests, the Company strengthened the market analysis, adhered to the coordination of the volume and price, made best efforts on the market trading, strived to increase effective power generation, took advantage of the opportunities from the policy of expanding the floating range of electricity price to optimize the marketing strategy in a timely manner and both of volume and price raised in electricity and heat supply fields. Total power generated by the Company's domestic operating power plants amounted to 457.336 billion KWh, representing a year-on-year increase of 13.20%. The electricity sold amounted to 430.165 billion KWh, representing a year-on-year increase of 13.23%. The annual average utilization hours of the Company's domestic power plants reached 4,058 hours, representing a year-on-year increase of 314 hours. In particular, the utilization hours of coal-fired power generating units was 4,488 hours, representing a year-on-year increase of 429 hours. The utilization hours of most of the Company's coal-fired power plants were in a leading position in the areas where such power plants located. Total heat supplied by the Company amounted to 297 million GJ, representing a year-on-year increase of 12.64%.

3. Cost Control

In 2021, the Company procured an aggregate of 203 million tons of coal. In the context of the market environment of tense situation of coal supply and demand, the Company paid close attention to market trend in real time, took full advantage in the policy support, proactively seized the market opportunity, optimized procurement strategy and regional supply structure, strengthened the cooperation with major coal mines, identified high-quality low-cost

REPORT OF THE BOARD OF DIRECTORS

resources on an advanced basis, so as to control the procurement cost of fuel coal. However, affected by the significant increase in the coal price, the unit fuel cost for sales of power of the Company was RMB316.36/MWh throughout the year, representing a year-on-year increase of 51.32%.

4. Energy Saving and Environmental Protection

The Company maintained the leading position among major domestic power enterprises in terms of safety production, technical and economic and energy consumption indicators throughout the year. In 2021, the average equivalent availability ratio of the domestic thermal generating units of the Company was 93.26%, coal consumption of power supply of 290.69g/kWh and the house consumption rate of plants was 4.34%, maintaining a leading position among major domestic power enerprises. With respect to air pollution emissions, the power generation companies affiliated to the Company have carried out ultra-low-emissions transformation as planned with marked results. All of them have met or outperformed the national emission standards. With respect to treatment of wastewater discharge and coal yards and ash yards, the Company has allocated funds to carry out environmental technological transformation projects such as wastewater treatment, coal yard closure, and ash yard transformation in power plants in key regions. All power plants have accelerated environmental protection transformation projects to ensure that pollutant emissions meet the stringent requirements under pollution discharge permits and other ecological and environmental protection policies.

5. Project Development

During the year, the controlled generation capacity of the newly commissioned thermal generating units, wind generating units, solar power units and biomass units was 2,000 MW, 2,403.45 MW, 799 MW and 30 MW, respectively. As of 31 December 2021, the Company's controlled and equity-based generation capacity was 118,695 MW and 103,875 MW, respectively.

6. Overseas Business

Tuas Power Ltd., a wholly-owned subsidiary of the Company in Singapore, maintained safe and stable operation of the generation units throughout the year. The total market share of Tuas Power Ltd. in the power generation market for the whole year was 19.2%. The Business in Singapore in 2021 recorded a pre-tax profit of RMB163 million, representing an increase of RMB32 million as compared with the same period last year.

Sahiwal coal-fired power plant is the first large-scale coal-fired power plant put into operation in the China-Pakistan Economic Corridor and makes positive contributions to easing the power shortage in Pakistan. The Business in Pakistan recorded a pre-tax profit of RMB776 million for 2021, representing an increase of RMB38 million as compared with the same period last year.

PROSPECTS FOR 2022

In 2022, the Company will continue to promote the implementation of the development strategy, actively respond to changes in the electricity, coal and capital markets, and strive to complete the annual production and operation tasks.

In terms of electric power construction, adhering to the green development concept, the Company will spend much effort to develop clean energy, optimize thermal power structure and speed up transformation and upgrading to achieve high-quality development by centering efficiency by means of modern management, under the support of science and technology innovation and on the basis of safe development.

In terms of electric power generation, the Company earnestly implements the regulations and policies in the field of safety production, and constantly optimizes management to prevent safety accidents. The Company conducts appraisal for the generator sets to comprehensively improve the lean level of facility management. While operating and maintaining the clean energy power generation system, the Company attaches importance to the basic and adjusting roles of existing thermal power generating unit in the energy safety system of the society, actively conducts life extension appraisal and transformation, and maintains the health level of standby set for emergency. The Company always focuses on the

economy and flexibility of the power generation assembly and meet the new market demands through technical transformation; actively develops the heat supply industry to upgrade integrated energy services; deeply studies the application prospect of biomass coupled power generation and grasps the market opportunities; and earnestly governs the environment protection well as demanded by the ecological civilization construction of various regions.

In terms of electric power marketing, the Company will take the principle of maximizing the overall benefit, strengthen market analysis, insist on volume and price coordination, make every effort to conduct market transactions, and strive to increase effective power generation. The Company will actively respond to the market reform of electricity, promote the construction of institutional mechanism and strengthen the training of market trading talents. The Company will fully develop the electricity sales market, improve the operation level of the energy sales company, and further promote the optimization of carbon market transactions, striving to achieve an annual domestic power generation of approximately 465 billion kWh.

In terms of fuel, the Company will closely follow the changes in policies and domestic and international coal markets, and strive to promote the signing of medium and long-term coal contracts to ensure strict performance of contracts. The Company will continue to optimize the supply structure and achieve the best procurement cost after comprehensively taking into account factors such as resource origin, transportation mode and coal type matching. The Company will strengthen inventory management, play the role of light storage and high consumption, buy low and use high, and strive to reduce procurement costs.

In terms of capital, the Company will keep an eye on changes in the international and domestic capital markets and give full play to its credit and management advantages, seize opportunities brought by the green finance policy, ensure the accessibility of main credit financing channel, increase the issuance in the interbank market, actively explore innovative financing tools in the capital market, broaden financing channels, and strive to reduce capital costs while ensuring capital security.

The Company will further enhance the awareness of opportunities and risks, seize the development opportunities, effectively deal with challenges, maintain strategic determination, make concerted efforts to overcome difficulties, coordinate safety and security, quality and efficiency improvement, transformation and upgrading, reform and innovation, strive to make progress so as to move forwards and accelerate the pace of creating an international first-class listed power generation company.

SUMMARY OF FINANCIAL INFORMATION AND OPERATING RESULTS

Please refer to the Financial Highlights on pages 8 to 9 for the summary of the operating results and assets and liabilities of the Company and its subsidiaries as at 31 December 2021 and for the accounting year ended 31 December 2021.

Please refer to pages 112 to 114 of the financial statements for the operating results of the Company and its subsidiaries for the accounting year ended 31 December 2021, which have been reviewed by the Company's Audit Committee.

DISTRIBUTABLE RESERVE

The distributable reserve as at 31 December 2021 calculated in accordance with the Company's Articles of Association is set out in Note 22 to the financial statements prepared under the International Financial Reporting Standards (the "IFRS").

DIVIDENDS

Since the listing of the Company, shareholders have given great support to and cared much for the Company. The Company has also generated returns that have been growing continuously and steadily

REPORT OF THE BOARD OF DIRECTORS

over the years. The Company has been paying dividends to shareholders every year since 1998, with an accumulated dividend of RMB62.687 billion paid.

The Company's articles provided for its cash dividend policy that the Company may pay cash dividends in any year when its earnings and accumulated retained profits are positive and its cash flows are sufficient for the normal conduct of business and sustainable development of the Company, provided that the profits to be distributed by the Company in cash shall, in principle, not be less than 50% of the distributable profits realized in that year as indicated in the consolidated statements.

In accordance with the requirements of relevant laws and regulations and the articles of association of the Company, the Company adheres to the profit distribution policy whereby the distributable profits shall be the lower of distributable profits as stated in the financial statements prepared under the PRC GAAP and the International Financial Reporting Standards.

According to the Company's Articles of Association, due to the negative net profit attributable to equity holders of the Company in 2021, and having taken into account the investment needs of the Company's transformation and development and the increase in the Company's gearing ratio in 2021, the Board of Directors recommended that no dividend be distributed in 2021. The proposal has been reviewed and approved by the Company's Board of Directors and the Supervisory Committee, and will be submitted to the Company's annual general meeting for consideration.

PRINCIPAL BUSINESS

The domestic power plants of the Company and its subsidiaries are located in 26 provinces, autonomous regions and municipalities. The Company also has a wholly-owned power plant in Singapore and invested in a power generation company in Pakistan. The core business of the Company is to develop, construct and operate large-scale power plants throughout China by making use of modern technology and equipment and financial resources available domestically and internationally. The power plant facilities of the Company are technically advanced, highly efficient and stable.

SUBSIDIARIES AND ASSOCIATES

Please refer to Notes 9 and 8 to the financial statements prepared under the IFRS for details of the Company's subsidiaries and associates.

THE USE AND DEPOSIT OF FUNDS RAISED

As approved under the Reply Approving the Non-public Issuance of Shares of Huaneng Power International, Inc. of China Securities Regulatory Commission (Zheng Jian Xu Ke [2018] No. 696), the Company issued 497,709,919 RMB ordinary shares (A shares) under non-public issuance to 7 target subscribers, with total proceeds of RMB3,259,999,969.45. After deducting the expenses such as underwriting and sponsor fees, the net proceeds were RMB3,245,329,969.59. As at 10 October 2018, the proceeds have all been received.

According to the A-share issuance plan and the announcement on changing the certain proceeds-funded investment projects and implementation methods, the proceeds from the non-public issuance of A-shares were used for capital expenditure of Xiegang Gas Turbine Project in Guangdong, Dafeng Offshore Wind Power Project in Jiangsu, Mianchi Phoenix Mountain Wind Power Project in Henan, and Longchi Wind Power Project in Anhui.

As at 31 December 2021, the Company has utilized RMB2,406.8115 million of the proceeds (including to replace the self-raised funds of RMB597 million that was previously invested in the proceeds-funded projects) on a cumulative basis. Upon the consideration and approval at the second extraordinary general meeting in 2021, the Company used the proceeds of RMB855.7738 million (including interest) to permanently replenish working capital on 23 December 2021. The special account for the raised fund would no longer be used when the raised fund was transferred out. The Company completed all the procedures for cancellation of the special account by 11 February 2022.

BONDS

During the year, the Company successfully issued bonds with a total principal amount of RMB58.800 billion in meeting its operational needs. Please refer to Note 25 and 29 to the financial statements prepared under the IFRS for details.

BANK LOANS AND OTHER BORROWINGS

Please refer to Notes 24 and 30 to the financial statements prepared under the IFRS for details of bank loans and other borrowings of the Company and its subsidiaries as at 31 December 2021.

CAPITALIZED INTERESTS

Please refer to Note 6 to the financial statements prepared under the IFRS for details of the capitalized interests of the Company and its subsidiaries during the year.

PROPERTIES, PLANTS AND EQUIPMENT

Please refer to Note 7 to the financial statements prepared under the IFRS for details of properties, plants and equipment of the Company and its subsidiaries during the year.

RESERVES

Please refer to the consolidated statement of changes in equity on pages 118 to 121 of the financial statements prepared under the IFRS for details of statutory reserves of the Company and its subsidiaries during the year.

PRE-EMPTIVE RIGHTS

According to the articles of the Company and the laws of the PRC, there are no provisions for pre-emptive rights requiring the Company to offer new shares to the existing shareholders of the Company in proportion to their shareholdings.

LARGEST SUPPLIERS AND CUSTOMERS

The five largest suppliers of the Company and its subsidiaries for 2021 were China Huaneng Group Fuel Co., Ltd., Huaneng Supply Chain Platform Technology Co, Ltd., Huayang New Material Technology Group Co., Ltd., Shaanxi Coal Selling and Transportation (Group) Corporation and China Coal Energy Company Limited respectively. The total purchase from them amounted to approximately RMB90.387 billion, representing approximately 47% of the total purchase of the year. The largest supplier was China Huaneng Group Fuel Co., Ltd., the purchase from which amounted to RMB41.834 billion, representing approximately 22% of the total purchase of the year.

As a domestic power producer, the Company sells the electricity generated by its power plants mainly through local grid operators. The five largest customers of the Company and its subsidiaries for 2021 were State Grid Shandong Electric Power Company, State Grid Jiangsu Electric Power Company, State Grid Zhejiang Electric Power Company, China Southern Power Grid Guangdong Power Grid Co., Ltd. and State Grid Jiangxi Electric Power Company. The combined amount of sales of power was approximately RMB81.469 billion (exclusive of taxes), representing approximately 40% of the total sales of power for the year. The largest customers was State Grid Shandong Electric Power Company, and the amount of sale was RMB30.346 billion (exclusive of taxes), representing approximately 15% of the total sales of power for the year.

None of the directors, supervisors and their respective close associates (as defined in the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (the "Listing Rules")) had any interest in the five largest suppliers and customers of the Company mentioned above in 2021.

CONTINUING CONNECTED TRANSACTIONS AND CONNECTED TRANSACTIONS

The following are the continuing connected transactions and

REPORT OF THE BOARD OF DIRECTORS

connected transactions of the Company in 2021 according to the requirements of the Listing Rules:

CONTINUING CONNECTED TRANSACTIONS

1. Continuing Connected Transactions with Huaneng Group, Huaneng Finance and Tiancheng Leasing

The major continuing connected transactions of the Company are those transactions conducted between the Company and its subsidiaries and certain subsidiaries and/or associates of Huaneng Group. Huaneng Group holds a 75% direct interest and a 25% indirect interest in HIPDC. HIPDC, as the immediate controlling shareholder of the Company, holds 32.28% equity interest of the Company. In addition, Huaneng Group holds a 9.91% direct equity interest in the Company, a 3.01% indirect equity interest in the Company through its wholly-owned subsidiary and China Hua Neng Group Hong Kong Limited ("**Hua Neng HK**"), a 0.84% indirect equity interest in the Company through China Huaneng Group Treasury Management (Hong Kong) Limited ("**Huaneng Treasury**"), an indirect wholly-owned subsidiary of Huaneng Group, and a 0.19% indirect equity interest in the Company through China Huaneng Finance Corporation Limited ("**Huaneng Finance**"), a controlling subsidiary of Huaneng Group and the Company holds approximately 52% and 20% equity interests respectively in Huaneng Finance. Huaneng Tiancheng Financial Leasing Co., Ltd. ("**Tiancheng Leasing**") is a controlling subsidiary of Huaneng Group which in aggregate holds a 80% equity interest, whilst the remaining 20% equity interest is held by the Company. Therefore, Huaneng Group, Huaneng Finance and Tiancheng Leasing are connected persons to the Company and transactions between the Company and the subsidiaries and/or associates of Huaneng Group constitute connected transactions of the Company under the Listing Rules. The purposes of the Company to enter into such continuing connected transactions with those connected persons were to meet the operational needs of the Company and to get the most favourable terms and conditions from the market from the Company's perspective. The relevant information regarding the continuing connected transactions are summarized as follows:

(i) Huaneng Group Framework Agreement was entered into between the Company and Huaneng Group on 5 November 2020 for a term commencing on 1 January 2021 and expiring on 31 December 2021. Pursuant to the Framework Agreement, the Company would conduct the following transactions with Huaneng Group and its subsidiaries and associates on an ongoing basis:

- Due to operational needs, the Company and its subsidiaries have to purchase ancillary equipment and parts which include mainly the raw materials and ancillary equipment and other installation and products relevant to the production operation for the infrastructure construction works for power plants. Pursuant to the Huaneng Group Framework Agreement, the terms and the prices with respect to the purchase of ancillary equipment and parts by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates are negotiated at arm's length terms, taking into account the then prevailing market conditions; but in any event at the terms and prices no less favourable than those offered to the Company and its subsidiaries by an independent third party for the same or similar type of ancillary equipment and parts. In addition, the payment of such purchases will be settled in cash in arrears, or in accordance with the payment terms agreed by the relevant parties in the contracts to be entered into pursuant to such framework agreement.

  For the year ended 31 December 2021, the caps with respect to the purchase of ancillary equipment and parts by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates under the Huaneng Group Framework Agreement will not exceed RMB2 billion. The actual

transaction amount for the year ended 31 December 2021 was RMB571 million.

- The Company's main fuel for power generation is coal. Pursuant to the Huaneng Group Framework Agreement, the Company and its subsidiaries will purchase fuel and coal transportation services from Huaneng Group and its subsidiaries and associates at prices and charges calculated by reference to RMB/ton and the actual weight of carriage, with arm's length terms taking into account the then prevailing market conditions, and in any event the terms of the purchases of coal and the transportation services shall be no less favourable than those offered by independent third parties to the Company and its subsidiaries for the same or similar type of fuel supply or transportation services.

  The Company entered into the Supplemental Agreement to Huaneng Group Framework Agreement on 28 September 2021 with Huaneng Group to revise the estimated transaction amount for the purchase of fuel and transportation services for 2021. Pursuant to the Supplemental Agreement to Huaneng Group Framework Agreement, the caps for the purchase of fuel and transportation service by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates in 2021 shall be revised to RMB85 billion. The actual transaction amount for the year ended 31 December 2021 was RMB78,459 million.

- For operational needs, the Company and its subsidiaries have to lease facilities, land and office spaces (mainly power transmission and transformation assets, vessels, power plants land and office spaces, etc.) from Huaneng Group and its subsidiaries and associates. Pursuant to the Huaneng Group Framework Agreement, the terms and the prices with respect to the leasing of facilities, land and office spaces by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates are negotiated at arm's length terms, taking into account the then prevailing market conditions; but in any event at the leasing terms and prices no less favourable than those offered to the Company and its subsidiaries by independent third parties for the leasing of the same or similar type of facilities, land and office spaces. In addition, the payment of such purchases will be settled in cash, or in accordance with the payment terms agreed by the relevant parties in the contracts to be entered into pursuant to such framework agreement.

  The caps with respect to the leasing of facilities, land and office spaces for 2021 by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates under the Huaneng Group Framework Agreement will not exceed RMB300 million. The actual transaction amount for the year ended 31 December 2021 was RMB122 million.

- The reciprocal technical services, engineering contracting services and other services between the Company and its subsidiaries and Huaneng Group and its subsidiaries and associates mainly include the provision of fuel management service relevant to power plants, maintenance services for power plants' monitoring systems, real-time consolidation of project data, trial run of generating units, supervision of manufacture of facilities for construction works in progress and insurance services by Huaneng Group and its subsidiaries and associates to the Company and its subsidiaries. At the same time, the Company and its subsidiaries provide operation/production related services to Huaneng Group and its subsidiaries and associates.

  Pursuant to the Huaneng Group Framework Agreement, the terms and the prices of transactions with respect to technical services, engineering contracting services and other services

REPORT OF THE BOARD OF DIRECTORS

between the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates are negotiated at arm's length terms, taking into account the then prevailing market conditions; but in any event at the terms and prices no less favourable than those offered to the Company and its subsidiaries by independent third parties for the same or similar types of technical services, engineering contracting services and other services. In addition, the payment of consideration will be settled in cash in arrears, or in accordance with the payment terms agreed by the relevant parties in the contracts to be entered into pursuant to the framework agreement.

The amount payable by the Company and its subsidiaries to Huaneng Group and its subsidiaries and associates with respect to technical services, engineering contracting services and other services for 2021 under the Huaneng Group Framework Agreement will not exceed RMB2.9 billion. The actual transaction amount for the year ended 31 December 2021 was RMB2,564 million.

- Provision of entrusted sale services to the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates mainly involved the use of power generation quota of Huaneng Group and its subsidiaries and associates by the Company and its subsidiaries for substituted power generation. Pursuant to the Huaneng Group Framework Agreement, the terms and prices with respect to the provision of aforesaid entrusted sale services between the Company and its subsidiaries and Huaneng Group and its subsidiaries and associates are negotiated at arm's length terms, taking into account the then prevailing market conditions; but in any event at the terms and prices no less favorable than those offered by the Company and its subsidiaries to an independent third party for the same or similar type of services.

  Pursuant to the Huaneng Group Framework Agreement, the cap for the provision of entrusted sale services to the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates for 2021 was RMB700 million. The actual transaction amount for the year ended 31 December 2021 was nil.

- To be more cost-efficient in management, the Company's subsidiary(ies) will sell products (mainly coal) to Huaneng Group and its subsidiaries and associates at coal prices and charges calculated by reference to RMB/ton and the actual weight of carriage, with arm's length terms taking into account the then market conditions, and in any event the terms of the coal price and other related products shall be no less favourable than those offered by independent third parties to the Company and its subsidiaries for the same or similar type of coal supply or other related products.

  Pursuant to the Huaneng Group Framework Agreement, the cap with respect to the sale of products by the Company to Huaneng Group and its subsidiaries and associates for 2021 was RMB500 million. The actual transaction amount for the year ended 31 December 2021 was nil.

- The electricity purchase by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates is mainly attributable to the demand for participation in the electricity market transactions by local government(s) and electricity trading centres organised in their respective regions. Pursuant to the current transaction settlement method, the Company and its subsidiaries purchase electricity from power plants of connected persons (including Huaneng Group and its subsidiaries and associates) or electricity sales companies and settle through the grid enterprises in accordance with the contractual agreements between the parties to the

transaction. There is no actual settlement relationship between the Company and its connected persons (including Huaneng Group and its subsidiaries and associates), and the transaction amount is determined according to the contractual terms of both parties to the transaction.

For the year ended 31 December 2021, the annual cap with respect to purchase of electricity by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates was RMB200 million. The actual transaction amount for the year ended 31 December 2021 was nil.

- The Company and its subsidiaries sell heat to Huaneng Group and its subsidiaries and associates, mainly including the sales of industrial steam, hot water and other thermal products produced by the Company's power plants and heating enterprises.

  Pursuant to the Huaneng Group Framework Agreement, the cap in respect of the sale of heat by the Company to Huaneng Group and its subsidiaries and associates for 2021 was RMB100 million. The actual transaction amount for the year ended 31 December 2021 was RMB56 million.

(ii) Huaneng Finance Framework Agreement (the "**Original Finance Framework Agreement**") was entered into between the Company and Huaneng Finance on 1 November 2019 for a term of three years commencing on 1 January 2020 and expiring on 31 December 2022, so as to replace the framework agreement between the Company and Huaneng Finance on 5 December 2016. On 26 October 2021, the Company and Huaneng Finance entered into the Huaneng Finance Framework Agreement for a term from 2022 to 2024 to adjust and continue to carry out the deposits, note discounting and loans matters between the Company and Huaneng Finance from 1 January 2022 to 31 December 2024.

Pursuant to the Original Huaneng Finance Framework Agreement, the Company from time to time places deposits with Huaneng Finance at rates which are no less favourable than the rates available from independent third parties for provision of similar services in the PRC. With respect to the note discounting services and loan advancement services provided by Huaneng Finance, no security is granted over the assets of the Company in respect of such services, so relevant transactions are exempt from all the reporting, announcement and Independent Shareholders' approval requirements pursuant to Rule 14A.90 of the Listing Rules.

Pursuant to the Original Huaneng Finance Framework Agreement, for the period from 1 January 2021 to 31 December 2021, the outstanding balances of the deposits of the Company and its subsidiaries placed with Huaneng Finance shall not exceed RMB14 billion (or its equivalent in foreign currency) on a daily basis. For the year ended 31 December 2021, the maximum deposits of the Company and its subsidiaries with Huaneng Finance was RMB14,000 million.

(iii) Tiancheng Leasing Framework Agreement was entered into between the Company and Tiancheng Leasing on 1 November 2019 for a term of three years commencing on 1 January 2020 and expiring on 31 December 2022, so as to replace the leasing framework agreement between the Company and Tiancheng Leasing on 5 December 2016.

Pursuant to the Tiancheng Leasing Framework Agreement, the finance lease business conducted by the Company and its subsidiaries with Tiancheng Leasing includes direct lease, sale-and-leaseback and trusted lease. In conducting finance lease with the Company and its subsidiaries, Tiancheng Leasing shall offer terms in respect of such transactions to the Company and its

REPORT OF THE BOARD OF DIRECTORS

subsidiaries that are normal commercial terms which shall in any event be no less favourable than those terms can be obtained by the Company and its subsidiaries from independent third parties. Lease Interest will be determined by the parties after arm's length negotiations, taking into account the market conditions and referring to the benchmark lending rates for term loans promulgated by the People's Bank of China from time to time, and will be no less favourable than the terms offered to the Company by domestic independent third parties for provision of similar services. Handling fee (if any) may be charged by Tiancheng Leasing from the Company and its subsidiaries at the time of conclusion of the finance leases under the Tiancheng Leasing Framework Agreement on terms no less favourable than those offered to the Company and its subsidiaries by independent third parties and at such rate as fixed by reference to, among others, the charge rates of other major financial institutions in the PRC for finance leases of assets of the same or similar type or the applicable rate (if any) published by the People's Bank of China from time to time in relation to such services and as set forth in the relevant written financial lease(s).

Under the Tiancheng Leasing Framework Agreement, with respect to the transaction amount between the Company and its subsidiaries and Tiancheng Leasing for the period from 2020 to 2022, it is estimated that the Lease Principal (the maximum daily balances of the Lease Principal each year) will be RMB10 billion and the Lease Interest will be capped at RMB490 million. For purposes of the Hong Kong Listing Rules, the Direct Lease(s) involve(s) "acquisition" while the Sales and Leaseback constitute "disposal". The transaction amount contemplated under the Direct Leases category of the Tiancheng Leasing Framework Agreement between the Company and its subsidiaries and Tiancheng Leasing for the period from 2020 to 2022 at RMB8 billion each year, and the transaction amount contemplated under the Sales and Leaseback category of the Tiancheng Leasing Framework Agreement between the Company and its subsidiaries and Tiancheng Leasing for the period from 2020 to 2022 at RMB2 billion each year.

For the year ended 31 December 2021, the actual amount of maximum daily balances of the Lease Principal under the Direct Leases between the Company and its subsidiaries and Tiancheng Leasing was RMB3.177 billion, and the actual amount of lease Interest was RMB119 million, and the maximum daily balances of the Lease Principal under the Sales and Leaseback between the Company and its subsidiaries and Tiancheng Leasing was RMB776 million, and the Lease Interest was RMB26 million.

2. Continuing Connected Transactions with Temasek and its subsidiaries and associates

Upon the completion of the acquisition of SinoSing Power Pte. Ltd. by the Company, TPGS Green Energy Pte. Ltd. became an indirect non-wholly owned subsidiary of the Company, of which 75% is owned by Tuas Power Ltd., an indirect wholly-owned subsidiary of the Company, and the remaining 25% is owned by Gas Supply Pte. Ltd., which is a wholly-owned subsidiary of Temasek Holdings (Private) Limited ("**Temasek**").

Temasek therefore became a substantial shareholder of a subsidiary of the Company and a connected person of the Company, and the on-going transactions between certain subsidiaries of the Company and the associates of Temasek ("**Continuing Connected Transactions with Associates of Temasek**") became continuing connected transaction of the Company under the Listing Rules.

The Company considers that Temasek meets the criteria for a passive investor under Rule 14A.100 of the Listing Rules. As such, any connected transactions or continuing connected transactions of a revenue nature in the ordinary and usual course of our business and on normal commercial terms with an associate of Temasek, pursuant to Rule 14A.99 of the Listing Rules, will be exempt from reporting, annual review, announcement and independent shareholders'

approval requirement under the Listing Rules. This exemption will be applicable to, amongst other things, the types of Continuing Connected Transactions with Associates of Temasek.

If the exemption is no longer applicable in relation to the Continuing Connected Transactions with Associates of Temasek, the Company will comply with the applicable reporting, annual review, announcement and independent shareholders' approval requirements.

CONNECTED TRANSACTIONS

1. Formation of Joint Venture

On 27 April 2021, the Company entered into the investment agreement regarding Huaneng Chongqing Wushan Wind Power Limited Liability Company (the "**Investment Agreement**") with Pro-Power Investment Limited ("**Pro-Power Investment**"). Pursuant to the terms and conditions of the Investment Agreement, the Company and Pro-Power Investment will jointly fund the establishment of Huaneng Chongqing Wushan Wind Power Limited Liability ("**Wushan Company**"). The Company will contribute no more than RMB81 million and Pro-Power Investment will contribute RMB27 million (or its equivalent). The establishment of Wushan Company is to meet the development and construction requirements of the wind power project in Wushan and to enjoy tax preferential policies. After the completion of the transaction, the Company will hold 75% of the equity interest of Wushan Company, while Pro-Power Investment will hold 25% of the equity interest of Wushan Company and consolidate Wushan Company into its consolidated statement.

Save as disclosed above, Huaneng Group is the connected person of the Company and Pro-Power Investment is a wholly-owned subsidiary of Hua Neng HK (a wholly-owned subsidiary of Huaneng Group). According to the Hong Kong Listing Rules, Pro-Power Investment is connected person/associate of the Company, the transaction constitutes a connected transaction of the Company.

For details on formation of joint venture, please refer to the Company's announcement dated 28 April 2021.

2. Capital Increase in Clean Energy Institute

On 22 June 2021, the Company entered into the Capital Increase Agreement with Huaneng Group, Xi'an Thermal Power Research Institute Co., Ltd. ("**Xi'an Institute**"), Huaneng New Energy Co., Ltd. ("**New Energy Co.**"), Northern United Power Co., Ltd. ("**Northern Co.**"), Inner Mongolia Eastern Energy Co., Ltd. ("**Mongolia Eastern Co.**") and China Huaneng Group Clean Energy Technology Research Institute Co., Ltd. ("**Clean Energy Institute**"). Pursuant to the terms and conditions of the Capital Increase Agreement, the Company shall subscribe part of the new registered capital of Clean Energy Institute in an amount of RMB389,616,900. Capital increase is an actual implementation by the Company to accelerate the leapfrog development of new energy and increase technological innovation to lead high-quality development. After completion of the Capital Increase, the Company became a shareholder of Clean Energy Institute, holding 30% shareholding interest in Clean Energy Institute.

Huaneng Group is a connected person of the Company, Xi'an Institute, New Energy Co., Northern Co. and Mongolia Eastern Co., all being the controlling subsidiaries of Huaneng Group, are associates of connected persons according to the Hong Kong Listing Rules. According to the relevant provisions of the Hong Kong Listing Rules, the capital increase constitutes a connected transaction of the Company.

For details on the capital increase in Clean Energy Institute, please refer to the Company's announcement dated 23 June 2021.

3. Amendment to Joint Venture Contract

On 22 June 2021, the Company entered into the agreement relating to the amendment of Joint Venture Contract of Hebei Hanfeng Power Generation Limited Liability Company ("**Amendment to Joint Venture Contract**") with Widewin Investments Limited ("**Widewin Investments**") and Hebei Jiantou Energy Investment Co., Ltd.

REPORT OF THE BOARD OF DIRECTORS

("**Jiantou Energy**"), pursuant to the terms and conditions of which, the Company, Jiantou Energy and Widewin Investments proposed to change the term of operation of Hebei Hanfeng Power Generation Limited Liability Company ("**Hanfeng Power Plant**") into perpetual operation. In addition, the Company and Jiantou Energy would make appropriate compensation of RMB98 million to Widewin Investments for the difference in its investment. The Company shall contribute RMB65.3 million thereof and Jiantou Energy shall contribute RMB32.7 million thereof. The Company does not consolidate the financial statements of Hanfeng Power Plant prior to or after this transaction, which will not result in a change in the scope of the Company's consolidated statements.

Widewin Investments is a foreign company, the establishment of which was funded by Hua Neng HK, a wholly subsidiary of Huaneng Group (the connected person of the Company), CITIC Pacific and Yanshan International (with equity interests of 37.5%, 37.5% and 25%). According to the Hong Kong Listing Rules, Widewin Investments is an associate of the connected person of the Company, and the transaction constitutes a connected transaction of the Company.

For details on the Amendment to Joint Venture Contract and this transaction, please refer to the Company's announcement dated 23 June 2021.

4. Formation of Fengcheng Company

On 27 July 2021, Huaneng Jiangxi Clean Energy Co., Ltd. ("**Clean Energy Company**"), a wholly-owned subsidiary of the Company, entered into the Agreement regarding the establishment of a joint venture company between Huaneng Jiangxi Clean Energy Co., Ltd. and Pro-Power Investment Limited" ("**the Joint Venture Agreement**") with Pro-Power Investment. Pursuant to the terms and conditions of the Joint Venture Agreement, Clean Energy Company will jointly establish Huaneng Fengcheng New Energy Co., Ltd., ("**Fengcheng Company**") with Pro-Power Investment. Clean Energy Company will subscribe for the registered capital of no more than RMB924 million, and Pro-Power Investment will subscribe for RMB396 million (or equivalent in US dollars). Establishment of Fengcheng Company is to increase the proportion of the clean energy installed capacity of the Company, optimize the industrial structure and meet the development and construction requirements of photovoltaic base projects in Fengcheng. Upon completion of the transaction, Clean Energy Company will hold 70% of the equity interest of Fengcheng Company, while Pro-Power Investment would hold 30% of the equity interest of Fengcheng Company.

Save as disclosed above, Pro-Power Investment is an associate of the connected person of the Company, and the transaction constitutes a connected transaction of the Company.

For details on formation of Fengcheng Company, please refer to the Company's announcement dated 28 July 2021.

5. Formation of Daishan Wind Power Company

On 31 August 2021, Huaneng (Zhejiang) Energy Development Co., Ltd. ("**Zhejiang Company**"), a wholly-owned subsidiary of the Company, entered into Daishan No.1 Offshore Wind Power Company Cooperation Agreement ("**the Cooperation Agreement**") with Huaneng Treasury, Zhejiang Province Zhoushan City Daishan Penglai Communications Investment Group Co., Ltd. ("**Daishan Communications Investment**"), China Communications Third Harbour Engineering Bureau Co., Ltd. ("**CC Third Harbour**") and Shanghai Electric Wind Power Group Co., Ltd. ("**Shanghai Electric Wind**"). Pursuant to the terms and conditions of the Cooperation Agreement, Zhejiang Company will jointly establish Huaneng (Zhejiang Daishan) Offshore Wind Power Generation Co., Ltd. (**"Daishan Wind Power Company**") with Huaneng Treasury, Daishan Communications Investment, CC Third Harbour and Shanghai Electric Wind. Zhejiang Company will contribute RMB600 million, Huaneng Treasury will contribute

RMB equivalent of 525 million in USD, Daishan Communications Investment will contribute RMB150 million, CC Third Harbour will contribute RMB112.50 million and Shanghai Electric Wind will contribute RMB112.50 million. The establishment of Daishan Wind Power Company is to increase the proportion of clean energy installed capacity of the Company, optimize the industrial structure and meet the development and construction requirements of Daishan No.1 Offshore Wind Power Plant Project. Upon completion of the Transaction, Zhejiang Company, Huaneng Treasury, Daishan Communications Investment, CC Third Harbour and Shanghai Electric Wind will hold 40%, 35%, 10%, 7.5% and 7.5% of equity interests, respectively, in Daishan Wind Power Company.

Save as disclosed above, Huaneng Group is the connected person of the Group and Huaneng Treasury is a wholly-owned subsidiary of Huaneng Group. According to the Hong Kong Listing Rules, Huaneng Treasury is an associate of the connected person of the Company, and the transaction constitutes a connected transaction of the Company.

For details on formation of Daishan Wind Power Company, please refer to the Company's announcement dated 1 September 2021.

6. Formation of Project Companies

On 3 November 2021, Huaneng Shandong Power Generation Co., Ltd. ("**Shandong Company**", a controlling subsidiary of the Company) and Huaneng Shandong (HK) Investment Limited ("**Shandong Company (HK)**"), entered into the Joint Venture Agreement of Guan County New Energy Project and the Joint Venture Agreement of Weifang Binhai District New Energy Project with Huaneng Treasury. On the same day, Shandong Company and Huaneng Treasury entered into the Joint Venture Agreement of Fushan Photovoltaic Power Generation Project, the Joint Venture Agreement of Haiyang New Energy Project and the Joint Venture Agreement of Dongming County Matou Town 100 MW Agricultural Photovoltaic Power Generation Project (collectively, the "**Joint Venture Agreements**"). Pursuant to the Joint Venture Agreements, Shandong Company, Huaneng Treasury and, where applicable, Shandong Company (HK) will jointly fund the establishment of Guan County New Energy Project Company, Weifang Binhai District New Energy Project Company, Fushan Photovoltaic Power Generation Project Company, Haiyang New Energy Project Company and Dongming County Matou Town 100 MW Agricultural Photovoltaic Power Generation Project Company (collectively, the "**Project Companies**") to jointly develop new energy projects, increase the proportion of the clean energy installed capacity of the Company, optimize the industrial structure and meet the development and construction requirements of new energy projects in Shandong province. The total investment in the formation of Project Companies is RMB2,587,616,600. The respective contribution proportion and amount of Shandong Company and Shandong Company (HK) for the establishment of the Project Companies are set out as follows:

REPORT OF THE BOARD OF DIRECTORS

Names of Project Companies	Shandong Company		Shandong Company (HK)	
	Contribution proportion	Contribution amount (RMB)	Contribution proportion	Contribution amount (RMB)
Huaneng (Liaocheng Guan County) New Energy Development Co., Ltd.(華能(聊城冠縣)新能源開發有限公司)	29%	433.2455 million	36%	537.8220 million
Huaneng (Weifang Binhai) New Energy Co., Ltd. (華能(濰坊濱海區)新能源有限公司)	20%	80 million	45%	180 million
Huaneng (Yantai Fushan) New Energy Technology Development Co., Ltd. (華能(煙台福山)新能源科技發展有限公司)	65%	92.0047 million	–	–
Huaneng Haiyang Photovoltaic Technology Co., Ltd. (華能海陽光伏科技有限公司)	65%	274.65503 million	–	–
Huaneng (Heze) Energy Development Co., Ltd. (華能(菏澤)能源開發有限公司)	65%	84.2236 million	–	–

Following completion of the Transaction, the financial results of each of the Project Companies will be consolidated into the financial statements of Shandong Company.

Shandong Company, in which the Company holds an 80% equity interest and Huaneng Group holds the remaining 20% interest, is a controlling subsidiary of the Company. Shandong Company is a connected subsidiary of the Company. Shandong Company (HK) is a wholly-owned subsidiary of Shandong Company and also a connected subsidiary of the Company.

Save as disclosed above, Huaneng Treasury is a wholly-owned subsidiary of Huaneng Group, the connected person of the Company, and, in accordance with the relevant provisions of the Hong Kong Listing Rules, Huaneng Treasury is an associate of a connected person of the Company and the transaction constitutes a connected transaction of the Company.

For details on formation of Project Companies, please refer to the Company's announcement dated 4 November 2021.

7. The Borrowing of Loan by a Subsidiary from a Connected Person and the Provision of External Guarantee by a Subsidiary

On 3 November 2021, Shandong Company (HK), a wholly-owned subsidiary of Shandong Company which in turn is a controlling subsidiary of the Company, signed the Loan Agreement with Huaneng Treasury, pursuant to which Shandong Company (HK) shall borrow USD28.125 million from Huaneng Treasury for a term of 5 years at the annual interest rate of 3.85%. On the same day, Shandong Company signed the Guarantee Contract with Huaneng Treasury, undertaking to provide a guarantee with an irrevocable joint and several liability for the debt obligations of USD28.125 million incurred by Shandong Company (HK) under the Loan Agreement.

Save as disclosed above, both of Shandong Company and Shandong Company (HK) are connected subsidiaries of the Company and Huaneng Treasury is an associate of a connected person of the Company, and the transaction and the guarantee constitute connected transactions of the Company.

For details on the borrowing of loan by a subsidiary from a connected person and the provision of external guarantee by a subsidiary, please refer to the Company's announcement dated 4 November 2021.

8. Formation of Caofeidian Clean Energy Company

On 29 December 2021, Huaneng Hebei Clean Energy Co., Ltd. ("**Hebei Company**"), a wholly-owned subsidiary of the Company entered into the Huaneng Shilihai 100MW Composite Photovoltaic Power Project Joint Venture Agreement (the "**Joint Venture Agreement**") with Huaneng Treasury. Pursuant to the terms and conditions of the Joint Venture Agreement, Hebei Company will jointly establish Huaneng Tangshan Caofeidian Clean Energy Co., Ltd. ("**Caofeidian Clean Energy Company**") with Huaneng Treasury and Hebei Company will contribute RMB119.616 million, while Huaneng Treasury will contribute in US dollars equivalent of RMB51.264 million. The establishment of Caofeidian Clean Energy Company is to increase the proportion of the Company's clean energy installed capacity, optimize the industry structure and meet the development and construction requirements of the Shilihai 100MW composite photovoltaic power generation project in Hebei, and the Company strives to develop and construct new energy power generation and other new business energy power generation project resources in Caofeidian, Hebei. After the completion of the Transaction, Hebei Company will hold 70% of Caofeidian Clean Energy Company, and Huaneng Treasury will hold 30% of Caofeidian Clean Energy Company. After completion of the transaction, the financial results of Caofeidian Clean Energy Company will be consolidated into the financial statement of Hebei Company.

Save as disclosed above, Huaneng Treasury is a wholly-owned subsidiary of Huaneng Group, the connected person of the Company. According to the Hong Kong Listing Rules, Huaneng Treasury is an associate of the connected person of the Company, and the transaction constitutes a connected transaction of the Company.

For details on formation of Caofeidian Clean Energy Company, please refer to the Company's announcement dated 30 December 2021.

9. Capital Increase in Zhanyi Company

On 29 December 2021, Yunnan Diandong Yuwang Energy Co., Ltd. ("**Yuwang Energy**") entered into the Capital Increase Agreement with Huaneng Treasury. Pursuant to the Capital Increase Agreement, Yuwang Energy and Huaneng Treasury shall subscribe for the newly increased capital of Huaneng Clean Energy (Qujing Zhanyi) Co., Ltd. ("**Zhanyi Company**") by way of cash in accordance with their respective shareholding ratios. Yuwang Energy shall use its own internal fund to pay Zhanyi Company not more than RMB117,000,000 as the consideration for the Capital Increase. The increase in the capital of Zhanyi Company is to meet the development and construction requirements of the first phase of the 100 MW project of Qujing Zhanyi Lingjiao Agricultural Photovoltaic Power Generation Project. Upon completion of the Capital Increase, Zhanyi Company's registered capital will be increased to RMB156,000,000, and Yuwang Energy's shareholding ratio in Zhanyi Company remains unchanged at 75%.

Save as disclosed above, Pro-Power Investment is the connected person/associate of the Company, the transaction constitutes a connected transaction of the Company.

For details on the capital increase in Zhanyi Company, please refer to the Company's announcement dated 30 December 2021.

In accordance with the requirements of Rule 14A.55 & 14A.71 of the Listing Rules of Hong Kong, the Independent Directors of the Company confirmed that the continuing connected transactions above to which the Company was a party:

(i) had been entered into by the Company and/or any of its subsidiaries in the ordinary and usual course of its business;

(ii) had been entered into on normal commercial terms or better; and

REPORT OF THE BOARD OF DIRECTORS

(iii) had been entered into according to the agreements governing them on terms that are fair and reasonable and in the interests of the shareholders of the Company as a whole.

Further, the Company has engaged its external auditor to report on the Company's continuing connected transactions in accordance with Hong Kong Standards on Assurance Engagements 3000 (Revised) "Assurance Engagements Other Than Audits or Reviews of Historical Financial Information" and with reference to Practice Note 740 "Auditor's Letter on Continuing Connected Transactions under the Hong Kong Listing Rules" issued by the Hong Kong Institute of Certified Public Accountants. In accordance with Rule 14A.71 of the Listing Rules, the Board of the Company confirmed that the external auditor of the Company had made a confirmation statement on the issues mentioned in Rule 14A.56 of the Hong Kong Listing Rules. The external auditor has issued an unqualified letter containing their findings and conclusions in respect of the continuing connected transactions set out in item 1 above. A copy of the auditor's letter has been provided by the Company to the Hong Kong Stock Exchange.

Several related party transactions as disclosed in Note 36 to the financial statements prepared in accordance with the IFRS fall under the definition of "continuing connected transaction" in Chapter 14A of the Listing Rules. The Company has complied with the disclosure requirements regarding connected transactions in accordance with Chapter 14A of the Listing Rules.

BUSINESS COMPETITION WITH CONTROLLING SHAREHOLDERS

The ultimate controlling shareholder of the Company, Huaneng Group and its subsidiaries, are also engaged in the power industry in China. To avoid business competition, Huaneng Group and the Company have already entrusted mutually to manage electric power assets in some regions.

To support the business development of the Company, Huaneng Group has committed to avoid business competition during its initial public offerings at home and abroad. On 17 September 2010, the Company received an undertaking from Huaneng Group regarding further avoidance of business competition. On the premises of continuing the undertaking previously provided, Huaneng Group further undertook that: (1) it should treat the Company as the only platform for integrating the conventional energy business of Huaneng Group; (2) with respect to the conventional energy business assets of Huaneng Group located in Shandong Province, Huaneng Group undertook that it would take approximately 5 years to improve the profitability of such assets and when the terms become appropriate, it would inject those assets into the Company. The Company had a right of first refusal to acquire from Huaneng Group the newly developed, acquired or invested projects which are engaged in the conventional energy business of Huaneng Group located in Shandong Province; (3) with respect to the other non-listed conventional energy business assets of Huaneng Group located in other provincial administrative regions, Huaneng Group undertook that it would take approximately five years, and upon such assets meeting the conditions for listing, to inject such assets into the Company, with a view to supporting the Company's continuous and stable development; and (4) Huaneng Group would continue to perform each of its undertakings to support the development of its listed subsidiaries.

On 28 June 2014, with a view to further clarify the scope of the relevant agreement and in line with the requirements under the "Regulatory Guidelines for Listed Companies No. 4 – Undertakings and performance by Listed Companies and Listed Companies' de facto Controllers, Shareholders, Related Parties and Acquirers", and taking into account the actual situation, Huaneng Group further enhanced the aforesaid non-compete undertaking as follows:

1. the Company would be the sole platform for integrating the conventional energy business of Huaneng Group;

2. with respect to the conventional energy business assets of Huaneng

Group located in Shandong Province, Huaneng Group undertook that it would, by the end of 2016, inject into the Company such assets of which the profitability should have been improved and meet with the requirements for injecting into a listed company (such as those assets with clean titles, the injection of which should not reduce the earnings per share of Huaneng Power, of no material non-compliance issues, with positive effect on preservation of and value appreciation of state owned assets, and wavier of pre-emptive rights being obtained from other shareholders of the assets), in addition, the Company should have the right of first refusal to acquire from Huaneng Group the newly developed, acquired or invested projects as engaged in the conventional energy business of Huaneng Group located in Shandong Province;

3. with respect to the other non-listed conventional energy business assets of Huaneng Group located in other provincial administrative regions, Huaneng Group undertook that it would, by the end of 2016, inject into the Company such assets of which the profitability should have been improved and meet with the requirements for injecting into a listed company (such as those assets with clear titles, the injection of which should not reduce the earnings per share of Huaneng Power, of no material non-compliance issues, with positive effect on preservation of and value appreciation of state owned assets, and wavier of pre-emptive rights being obtained from other shareholders of the assets), so as to support a sustainable and stable development of the Company;

4. Huaneng Group would continue to perform each of its aforesaid undertakings in order to support the development of its subordinated listed companies. The period of the undertaking was from 28 June 2014 to 31 December 2016.

The items (1) and (4) above are long term undertaking and are being currently performed. The Items (2) and (3) are undertakings with terms and condition and have been completed.

Currently, the Company has 15 directors and only 6 of them have positions in Huaneng Group. According to the articles of association of the Company, in case a conflict of interest arises, the relevant directors shall abstain from voting in the relevant resolutions. Therefore, the operation of the Company is independent from Huaneng Group, and the operation of the Company is conducted for its own benefit.

PURCHASE, SALE OR REDEMPTION OF SHARES OF THE COMPANY

The Company and its subsidiaries did not sell, purchase or redeem any shares or other securities of the Company in 2021.

REPORT OF THE BOARD OF DIRECTORS

DIRECTORS OF THE COMPANY

The directors of the Company during the year were as follows:

Name of Director	Position	Date of appointment
Shu Yinbiao	Honorary Chairman	Appointed on 5 March 2020
Zhao Keyu	Chairman	Appointed on 5 March 2020
Zhao Ping	Director	Appointed on 16 June 2020
Huang Jian	Director	Appointed on 27 August 2008
Wang Kui	Director	Appointed on 16 June 2020
Lu Fei	Director	Appointed on 16 June 2020
Teng Yu	Director	Appointed on 16 June 2020
Mi Dabin	Director	Appointed on 18 September 2014
Cheng Heng	Director	Appointed on 13 June 2017
Li Haifeng	Director	Appointed on 22 December 2020
Lin Chong	Director	Appointed on 13 June 2017
Xu Mengzhou	Independent Director	Appointed on 23 June 2016
Liu Jizhen	Independent Director	Appointed on 13 June 2017
Xu Haifeng	Independent Director	Appointed on 13 June 2017
Zhang Xianzhi	Independent Director	Appointed on 13 June 2017
Xia Qing	Independent Director	Appointed on 16 June 2020

MODEL CODE FOR SECURITIES TRANSACTIONS BY DIRECTORS AND SUPERVISORS

On 30 June 2021, the Company's Board considered and approved the Amended Management Guidelines Regarding the Holding of the Company's Shares by the Directors, Supervisors and Senior Management of Huaneng Power International, Inc. The standard of such guidelines is no less exacting than those set out in the Model Code for Securities Transactions by Directors of Listed Issuers as set out in Appendix 10 to the Listing Rules. Enquiries have been made with all Directors and Supervisors and all of them confirmed that they have complied with the code throughout 2021.

DIRECTORS', CHIEF EXECUTIVES' AND SUPERVISORS' RIGHT TO PURCHASE SHARES

For the year ended 31 December 2021, none of the Directors, Chief Executives, Supervisors of the Company or their respective associates had any interests in the shares of the Company or any associated corporations (within the meaning of the Securities and Futures Ordinance ("**SFO**")) which are (a) required to be notified to the Company and The Stock Exchange of Hong Kong Limited ("**Hong Kong Stock Exchange**") pursuant to Divisions 7 and 8 of Part XV of the SFO; or (b) required to be recorded in the register kept by the Company pursuant to Section 352 of the SFO; (c) required to be notified to the Company and the Hong Kong Stock Exchange pursuant to the Model Code for Securities Transactions by Directors of Listed Issuers.

For the year ended 31 December 2021, none of the Directors, Chief Executives, Supervisors, senior management of the Company or their spouses and children under the age of 18 was given the right to acquire any shares, underlying shares or debentures of the Company or any associated corporations (within the meaning of the SFO).

INDEPENDENT DIRECTORS' CONFIRMATION OF INDEPENDENCE

Each of the independent Directors of the Company, namely Mr. Xu Mengzhou, Mr. Liu Jizhen, Mr. Xu Haifeng, Mr. Zhang Xianzhi and Mr. Xia Qing has signed a confirmation letter by independent non-executive directors for 2021 on 22 March 2022 and the Company considered them to be independent.

EMOLUMENTS OF DIRECTORS AND SUPERVISORS

Details of the emoluments of Directors and Supervisors of the Company are set out in Note 38 to the financial statements prepared under the IFRS.

THE FIVE HIGHEST PAID EMPLOYEES

Details of the five highest paid employees of the Company are set out in Note 38 to the financial statements prepared under the IFRS.

PUBLIC FLOAT

As at the date of this report, the Company has maintained the prescribed public float under the Listing Rules and as agreed with the Hong Kong Stock Exchange, based on the information that is publicly available to the Company and within the knowledge of the directors.

STRUCTURE OF SHARE CAPITAL

As at 31 December 2021, the entire issued share capital of the Company amounted to 15,698,093,359 shares, of which 10,997,709,919 shares were domestic shares, representing 70.06% of the total issued share capital, and 4,700,383,440 shares were foreign shares, representing 29.94% of the total issued share capital of the Company. In respect of foreign shares, Huaneng Group through its wholly-owned subsidiaries China Hua Neng Group Hong Kong Limited and China Huaneng Group Treasury Management (Hong Kong) Limited, held 472,000,000 and 131,596,000 shares, representing 3.01% and 0.84% of the total issued share capital of the Company, respectively. In respect of domestic shares, Huaneng International Power Development Corporation ("**HIPDC**") owned a total of 5,066,662,118 shares, representing 32.28% of the total issued share capital of the Company, while Huaneng Group held 1,555,124,549 shares, representing 9.91% of the total issued share capital of the Company, and held 29,994,199 shares through its controlling subsidiary, China Huaneng Finance Corporation Limited, representing 0.19% of the total issued share capital of the Company. Other domestic shareholders held a total of 4,345,929,053 shares, representing 27.68% of the total issued share capital.

REPORT OF THE BOARD OF DIRECTORS

SHAREHOLDINGS OF MAJOR SHAREHOLDERS

The following table sets out the shareholdings of the top ten shareholders of the Company as at 31 December 2021:

Name of shareholder	Number of Shares held at year end	Percentage of Shareholding (%)
Huaneng International Power Development Corporation	5,066,662,118	32.28%
HKSCC Nominees Limited	4,109,498,222	26.18%
China Huaneng Group Co., Ltd.	1,555,124,549	9.91%
Hebei Construction & Investment Group Co., Ltd.	493,316,146	3.14%
China Hua Neng Group Hong Kong Limited	472,000,000	3.01%
China Securities Finance Corporation Limited	466,953,720	2.97%
Jiangsu Guoxin Investment Group Limited	332,964,700	2.12%
Liaoning Energy Investment (Group) Limited Liability Company	264,966,200	1.69%
Dalian City Investment Holding Group Co., Ltd.	257,070,000	1.64%
Fujian Investment and Development Group Co., Ltd.	251,814,185	1.60%

MATERIAL INTERESTS AND SHORT POSITIONS IN SHARES AND UNDERLYING SHARES OF THE COMPANY

As at 31 December 2021, the interests or short positions of persons who were entitled to exercise or control the exercise of 5% or more of the voting power at any of the Company's general meetings (excluding the Directors, Supervisors and chief executive) in the shares or underlying shares of equity derivatives of the Company as recorded in the register required to be kept under Section 336 of the Securities and Futures Ordinance (Cap. 571 of the laws of Hong Kong) (the "SFO") were as follows:

Name of shareholder	Class of shares	Number of shares held (share)	Capacity	Approximate percentage of shareholding in the Company's total issued share capital	Approximate percentage of shareholding in the Company's total issued domestic shares	Approximate Percentage of shareholding in the Company's total issued H Shares
Huaneng International Power Development Corporation *(Note 2)*	Domestic shares	5,066,662,118(L)	Beneficial owner	32.28%(L)	46.07%(L)	–
China Huaneng Group Co., Ltd. *(Note 3)*	Domestic shares	1,585,118,748(L)	Beneficial owner	10.10%(L)	14.41%(L)	–
China Huaneng Group Co., Ltd. *(Note 4)*	H Shares	603,596,000(L)	Beneficial owner	3.85%(L)	–	12.84%(L)
Luo Yi *(Note 5)*	H Shares	4,244,000(L)	Interest of controlled corporation	0.02%(L)	–	0.09%(L)
		511,594,000(L)	Interest of spouse	3.25%(L)	–	10.88%(L)
Qiu Guogen *(Note 5)*	H Shares	511,594,000(L)	Interest of controlled corporation	3.25%(L)	–	10.88%(L)
		4,244,000(L)	Interest of spouse	0.02%(L)	–	0.09%(L)

Notes:

(1) The letter "L" denotes a long position. The letter "S" denotes a short position. The letter "P" denotes interest in a lending pool.

(2) As at 31 December 2021, Huaneng Group holds 75% direct interests and 25% indirect interests in HIPDC.

(3) Of the 1,585,118,748 domestic shares, Huaneng Group through its controlling subsidiary, Huaneng Finance held 29,994,199 domestic shares.

(4) Huaneng Group held 472,000,000 H shares through its wholly-owned subsidiary, Hua Neng HK, and held 131,596,000 H shares through its indirect wholly-owned subsidiary, Huaneng Treasury.

(5) Long position of 515,838,000 H shares were held through various corporations by Chongyang Group Co., Ltd. (重陽集團有限公司), which was ultimately owned by Qiu Guogen.

Save as stated above, as at 31 December 2021, in the register required to be kept under Section 336 of SFO, no other persons were recorded to hold any interests or short positions in the shares or underlying shares of the equity derivatives of the Company.

INTEREST IN CONTRACTS AND SERVICE CONTRACTS

Save for the service contracts mentioned below, as at the end of 2021, the Directors and Supervisors of the Company did not have any material interests in any contracts entered into by the Company.

No Director and Supervisor has entered into any service contract which is not terminable by the Company within one year without payment of compensation (other than statutory compensation).

Each and every Director and Supervisor of the Company have entered into a service contract with the Company for a term of three years commencing from the signing of the contract.

REMUNERATION POLICY

The Company unceasingly improves its remuneration and distribution system and, in accordance with the overall development strategy of the Company, has formulated a set of remuneration management rules. Employees' salaries are determined by reference to the job positions they hold and calculated based on their job performance. Giving consideration to both efficiency and fairness, the Company creates a methodic and effective incentive mechanism by linking the employees' remuneration with their personal performance and the business performance of the Company as well. The remuneration of the Directors, Supervisors and senior management of the Company mainly consists of the following:

(1) Salaries and allowances

The basic salary is mainly set by an evaluation of the job position and a factor analysis, and with reference to the salary level of the relevant position in the labor market. It accounts for about 20% of the total remuneration.

(2) Discretionary bonus

Discretionary bonus is based on the operating results of the Company, the performance of the Directors, Supervisors and senior management. It accounts for about 65% of the total remuneration.

(3) Payments on pension, etc.

Contributions for various pension schemes such as endowment insurance, corporate annuity and housing fund established by the Company for the Directors, Supervisors and senior management accounts for about 15% of the total remuneration.

According to the resolution at the general meeting, the Company paid each independent

REPORT OF THE BOARD OF DIRECTORS

director a subsidy amounting to RMB300,000 (inclusive of tax) in 2021. The Company also reimburses the independent director for the expenses they incur in attending board meetings and general meetings and other reasonable expenses they incur while fulfilling their obligations under the Company Law and the Company's Articles of Association (including travelling expenses and administrative expenses). Besides these, the Company does not give the independent director any other benefit.

STAFF HOUSING

According to the relevant regulations of the state and local governments, the Company established a housing fund for the employees of the subsidiaries of the Company.

STAFF MEDICAL INSURANCE SCHEME

According to the requirements as prescribed by the relevant local governments, the Company and its subsidiaries have joined medical insurance schemes for their staff, and have implemented effectively in accordance with the plan.

RETIREMENT SCHEMES

The Company and its subsidiaries have implemented specified retirement contribution schemes in accordance with relevant requirements of the state and local governments.

Pursuant to the specified retirement contribution schemes, the Company and its subsidiaries have paid contributions according to the contracted terms and obligations set out in the publicly administered retirement insurance plans. The Company has no other obligations to pay further contributions after paying the prescribed contributions. The contributions payable from time to time will be regarded as expenses for the period and capital construction expenditure during the year they are made and accounted for as labor cost.

GENERAL MEETINGS

During the reporting period, the Company convened one annual general meeting and two extraordinary general meetings.

1. The Company's 2020 Annual General Meeting was held on 22 June 2021. The resolutions passed at the meeting were published in China Securities Journal and Shanghai Securities News on 23 June 2021.
2. The Company's 2021 First Extraordinary General Meeting was held on 16 November 2021. The resolutions passed at the meeting were published in China Securities Journal and Shanghai Securities News on 17 November 2021.
3. The Company's 2021 Second Extraordinary General Meeting was held on 21 December 2021. The resolutions passed at the meeting were published in China Securities Journal and Shanghai Securities News on 22 December 2021.

DISCLOSURE OF MAJOR EVENTS

1. Adjustment to the management of the Company

In order to continue to supplement and enrich our management capacity, the Company made the following adjustments to the management:

On 22 February 2021, Mr. Duan Rui was appointed as the secretary of the Discipline & Inspection Commission of the Company.

On 22 February 2021, Mr. Liu Ranxing ceased to hold the office of Vice President of the Company due to work reasons.

On 9 June 2021, Ms. Zhang Xiaojun resigned as a staff representative supervisor of the Supervisory Committee of the Company due to age reason. Instead, Mr. Zhu Tong was elected unanimously by the staff of the Company as the staff representative supervisor of the Tenth Session of the Supervisory Committee of the Company.

On 22 June 2021, Mr. Ye Cai ceased to act as the supervisor of the Company due to work relocation. Upon consideration and approval of the proposal regarding election of supervisor of the Company at the annual general meeting of the Company, Mr. Xia Aidong was elected as the supervisor of the Tenth Session of the Supervisory Committee of the Company.

OTHER DISCLOSURE

An analysis of the Company's performance using key financial performance indicators and a discussion on the principal risks and uncertainties facing by the Company are set out in the section headed "Management's Discussion and Analysis" in this annual report. Particulars on the significant events affecting the Company during the year can be found in the section headed "Major Corporate Events in 2021" in this annual report. In addition, discussions on the Company's environmental policies and performance, relationship with its major stakeholders, permitted indemnity provisions provided by the Company to its Directors and compliance with the relevant laws and regulations which have a significant impact on the Company are included in the sections headed "Management's Discussion and Analysis", "Corporate Governance Report" and "Social Responsibility Report" in this annual report. These discussions form part of this Report of the Board of Directors.

REQUIREMENTS UNDER THE ENVIRONMENTAL, SOCIAL AND GOVERNANCE REPORTING GUIDELINES

In 2021, in accordance with the requirements under the Environmental, Social and Governance Reporting Guidelines of the Hong Kong Stock Exchange amended on 18 December 2019, the Company has completed the preparation and disclosure of the Environmental, Social and Governance Report in due time, which will be published on the website of the Company and website of the Hong Kong Stock Exchange together with the annual report as scheduled.

CODE OF CORPORATE GOVERNANCE PRACTICES

Save as disclosed below, during the year, the Company has complied with the Corporate Governance Code as set out in Appendix 14 of the Listing Rules. The annual report of the Company will contain a corporate governance report prepared in accordance with the requirements under the Listing Rules.

DESIGNATED DEPOSIT

As at 31 December 2021, the Company and its subsidiaries did not have any designated deposit with any financial institutions within the PRC nor any overdue fixed deposit which could not be recovered.

LEGAL PROCEEDINGS

As at 31 December 2021, the Company and its subsidiaries were not involved in any material litigation or arbitration and no material litigation or claim was pending or threatened or made against the Company and its subsidiaries.

REPORT OF THE BOARD OF DIRECTORS

CHANGES OF INFORMATION OF DIRECTORS AND SUPERVISORS DURING THE REPORTING PERIOD

1. On 9 June 2021, Ms. Zhang Xiaojun resigned as a staff representative supervisor of the Supervisory Committee of the Company due to age reason. Instead, Mr. Zhu Tong was elected unanimously by the staff of the Company as the staff representative supervisor of the Tenth Session of the Supervisory Committee of the Company.

2. Upon consideration and approval of the proposal regarding election of supervisors of the Company at the annual general meeting convened by the Company on 22 June 2021, Mr. Xia Aidong was elected as the supervisor of the Tenth Session of the Supervisory Committee of the Company. Mr. Ye Cai ceased to be the supervisor of the Company due to work relocation.

ANNUAL GENERAL MEETING AND CLOSURE OF REGISTER

As the Company has yet to confirm the date of the 2021 annual general meeting, the record date(s) for determining the eligibility to attend and vote at the 2021 annual general meeting and the period(s) for closure of register, the Company will upon confirmation thereof announce such details in the notice of the 2021 annual general meeting. Such notice is expected to be issued to shareholders in May 2022.

AUDITORS

As approved at the 2020 annual general meeting, Ernst & Young Hua Ming LLP was appointed as the Company's domestic and U.S. 20F Annual Report auditor for 2021, and Ernst & Young, registered public interest entity auditor, was appointed as the Hong Kong auditor of the Company for 2021.

By Order of the Board
Zhao Keyu
Chairman

Beijing, the PRC
22 March 2022

REPORT OF THE SUPERVISORY COMMITTEE

TO ALL SHAREHOLDERS,

In 2021, with enormous support from the Board and the management, and in strict accordance with the Company Law, the Securities Law, the Articles of Association and other related laws and regulations, the Supervisory Committee of the Company conscientiously performed statutory supervision duties and carried out in-depth supervision and inspection to continuously promote the standard operation of corporate governance and protect the legitimate rights and interest of both the Company and its Shareholders.

1. OVERALL EVALUATION ON THE COMPANY'S OPERATION IN 2021

The year of 2021 was an eventful year in the development of the Company. In the context of the complex and serve external environment, the Board of the Company adhered to the "three-color" mission, earnestly implemented the new energy security strategy, capitalized on advantageous opportunities and made scientific decisions, coordinated the implementation of routine COVID-19 prevention and control and reform and development and operating management, and made efforts to promote high-quality development. The management of the Company conscientiously executed the decisions and arrangements made by the Board, made concerted efforts, managed to guarantee COVID-19 control and production, united and led all employees to actively cope with the risks of changes in power, fuel, and capital markets. Except that the operating results recorded losses affected by rising fuel price, the Company achieved fruitful results in safe production, transformation and upgrading, energy supply guarantee, disposal of non-performing enterprises and assisting enterprises with difficulties, technical innovation and overseas project management and maintained overall stability in the production, operation, politics and image safety.

The Supervisory Committee is of the view that during the reporting period, the Board operated in an effective and compliant manner, implemented the scientific decision-making carefully executed resolutions of the general meetings with earnest performance. The directors are highly concerned about the Company, and kept abreast with and instructed the work. The decision-making procedure of the Board is in full compliance with the laws and regulations of the listed location and the requirements of the Articles of Association, and its resolutions conform to the Company's demands in operation, management, transformation, and development. The management of the Company strictly executed the instructions given by the Board, and proactively implemented the supervision and reform policies to promote the Company's high-quality development comprehensively and continuously improve the corporate governance. There is no violation of any regulations in the operation.

2. PARTICULARS OF WORK PERFORMED BY THE SUPERVISORY COMMITTEE

(1) Changes of Supervisors

In 2021, Mr. Ye Cai and Ms. Zhang Xiaojun ceased to be the Supervisors of the Tenth Session of the Supervisory Committee of the Company due to work reason and age reason, respectively. The Company carried out the procedure of the nomination of new candidates in a timely manner, appointed Mr. Xia Aidong and Mr. Zhu Tong as the Supervisors (in particular, Mr. Zhu Tong was elected as the staff Supervisor), safeguarding the normal operation of the Supervisory Committee of the Company. The newly elected Supervisors are equipped with solid professional knowledge, rich management experience and good professional quality, which meet the functional requirements of supervision and examination of the Supervisory Committee. The number and staff composition of the Supervisory Committee strictly complies with the laws and regulations where the Company is listed and its Articles of Association, allowing the supervisors to perform their supervision responsibilities, which further contributes to the improvement in compliant operation and corporate governance.

REPORT OF THE SUPERVISORY COMMITTEE

(2) Particulars on Convention of the Meetings of the Supervisory Committee

In 2021, the Company's Supervisory Committee, in accordance with applicable laws, the Articles of Association and actual needs of the Company's development, strove to overcome various difficulties of the epidemic and totally held 4 meetings of the Supervisory Committee, including 2 on-site meetings and 2 communication meetings. It carried out deliberation and vote for the Company's 18 issues, including the annual work report of the Supervisory Committee, financial reports, profit distribution plan, proposal of provision for significant asset impairment, and proposal on arrangement of raised funds. Having attended the annual general meeting and organized to conduct ballot monitoring and ballot counting, it fully performed the due supervision and inspection responsibilities of the Supervisory Committee. These meetings were held in compliance with the relevant requirements of the regulatory rules of the places where the Company's shares are listed and the Articles of Association of the Company. Proposals and resolutions of these meetings have been disclosed and announced timely in accordance with relevant provisions regarding information disclosure.

(3) Training for the Members of the Supervisory Committee

All Supervisors of the Company paid close attention to the improvement of duties performance. They thoroughly studied and implemented the Securities Law and Opinions on Further Improving the Quality of Listed Companies of the State Council, actively participated in all kinds of special trainings held by the regulators and industry associations, and kept abreast of the update of the regulations and relevant policies of the places where the Company's shares are listed. The capacities of the Supervisors to perform their duties and practices have been further enhanced by ongoing and in-depth study.

3. PARTICULARS OF DISCHARGING DUTIES OF THE SUPERVISION AND EXPRESSING OF OPINIONS

(1) Legality of the Company's operations

In 2021, through various approaches including presenting at Board meetings, attending general meetings, the Chairman office meetings and the President office meetings and on-site research, the Supervisory Committee performed effective supervision and examination on the procedures for convening general meetings and board meetings and the resolutions thereof, the implementation of resolutions of general meetings by the Board, the performance of duties by Directors and the senior management of the Company, the implementation of internal control system of the Company and information disclosure, and expressed its opinions and views timely according to relevant laws and regulation of the State.

The Supervisory Committee is of the view that Company strictly complied with the Articles of Association of the Company and applicable laws of the jurisdictions in which the Company's shares are listed and had not identified any breach of relevant laws and regulations in the performance of decision-making procedures. Directors and senior management of the Company have set good examples, performed duties dutifully, diligently and earnestly and carefully implemented resolutions of the general meeting and the Board and have not identified any actions that violated the laws or caused damages to the interests of the Company in the performance of duties by the aforesaid persons.

(2) Examining the financial information and regular reports of the Company

The Supervisory Committee held regular meetings on a regular basis and reviewed the annual, the first quarter, semi-annual and third quarter financial reports, and carefully reviewed the final financial reports, the profit distribution plan, the annual report of the Company and the auditor's report for 2021 issued by the domestic and international auditors respectively at the meeting for the year 2021.

The Supervisory Committee is of the view that the preparation, audit and disclosure procedures of the periodic reports have complied with the requirements of relevant laws and regulations including the Company Law, the Accounting Law and the Articles of Association of the Company. The content of the reports has truly, accurately and completely reflected the financial position and operating results of the Company for 2021. The sound financial system, standardised financial operation and good financial condition of the Company is in place. The domestic and overseas auditor issued auditor's report for the Company in 2021 with standard unqualified opinion.

(3) Examining major issues such as fund raising, asset impairment and related party transactions

In 2021, the Company's Supervisory Committee continuously followed up the implementation and changes of the Board resolution on fund raising. In accordance with the regulatory requirement, the Supervisory Committee considered and approved the proposals such as the Proposal on Using Part of Idle Raised Funds to Temporarily Supplement Working Capital, the Proposal Regarding the Settlement of Fundraising Investment Projects and Use of Remaining Proceeds to Permanently Replenish Working Capital and Special Report on the Placement and Actual Use of the Raised Funds in the First Half Year of 2021 to ensure the legal compliance of the continued use and management process of surviving raised funds; attended meetings of Board of Directors and reviewed 11 proposals including Proposal on the Continuing Connected Transactions between the Company and Huaneng Group in 2022, Proposal regarding the Increase of the Annual Cap of the Continuing Connected Transactions for 2021 between the Company and Huaneng Group and Proposal regarding the Capital Increase and Share Expansion of Clean Energy Institute and supervised the fairness, rationality and necessity of connected transactions.

The Supervisory Committee is of the view that the Company implemented a complete system and strict decision-making process to carry out work involved in the aforesaid proposals to ensure the compliance and fairness of significant events including fund raising, asset impairment and connected transactions. No violation in the approval procedures and disclosure obligation related to significant operation event, no unfairness in the trading prices or any damages to the interests of the Company and minority shareholders were identified.

(4) Checking on particulars of the Company's information disclosure

During the Reporting Period, the Supervisors of the Company carefully examined the procedures for and the contents of information disclosure made by the Company by attending the Chairman office meetings, the President office meetings, the Information Disclosure Committee and other daily operation and management meetings. The Supervisory Committee placed great emphasis on and presented the annual and semi-annual meetings of the Board held and supervised the preparation and the review process related to the relevant reports of the Company. In addition, the Supervisory Committee convened

REPORT OF THE SUPERVISORY COMMITTEE

meetings at which its members reviewed the Company's annual reports and interim reports and listened to the reports on work related to information disclosure.

The Supervisory Committee is of the view that the Company's control over, and procedures on, the information disclosure was complete and effective. The procedures of information disclosure strictly complied with the "Measures on Information Disclosure Management" and the "Measures on Investor Relations Management", and met the regulatory requirements of the Company's listing places.

(5) Reviewing the Board's self-assessment report on internal control

At the annual Board meetings, the Supervisory Committee conscientiously listened to relevant reports on the Company's internal control, and convened supervisor meetings to review the Board's assessment report on internal control and carried out detailed and comprehensive review of the establishment and operation of internal control of the Company during the reporting period.

The Supervisory Committee is of the view that, the Company has established a sound internal control system according to its own situation and the requirement of laws and regulations, and the system has been effectively implemented. The internal control system is in accordance with relevant requirement of laws and regulations of the State and the actual needs of the Company, and has played a good role in risk prevention and control for the operation and management. The assessment report on internal control of the Company truly and objectively reflected the establishment and operation of the Company's internal control.

In 2022, the Supervisory Committee of the Company will continue to perform its diligence duty faithfully, keep working hard with vigorous endeavor and innovative thinking diligently and continuously raise its awareness of compliance, remained the commitment to fulfilling its supervisory duties and giving full play to its role as a supervisor. The Supervisory Committee is set to effectively safeguard and protect the legitimate rights and interests of both the Company and the Shareholders, assist the general meetings and the Board meetings to promote the further standardization and perfection of the corporate governance and make greater efforts to steadily drive the Company's high-quality development.

Supervisory Committee
Huaneng Power International, Inc.

Beijing, the PRC
22 March 2022

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT

PROFILES OF DIRECTORS AND SUPERVISORS

Directors



ZHAO Keyu, aged 55, is the Chairman and Party Secretary of the Company. He was the Chief of the Planning and Development Department, Chief of Office, Director and Secretary of the Party Office of Huaneng Group, the President and Deputy Party Secretary of the Company. He graduated from Wuhan University, majoring in software engineering, and is postgraduate with a master's degree in engineering. He is a senior economist.



ZHAO Ping, aged 59, is the Director, the President and the Deputy Party Secretary of the Company. He was the Vice President and the Deputy Party Secretary of the Company. He graduated from Tsinghua University, majoring in thermal engineering, is a postgraduate with a master's degree in science. He is a professor-level senior engineer. He is receiving special government allowance of the State Council.



HUANG Jian, aged 59, is a Director of the Company, a dedicated Director and Supervisor of Huaneng Group, a dedicated director of HIPDC, a dedicated director of Shandong Power Generation Co., Ltd.. He was an assistant to the President of Huaneng Group and Chairman of Huaneng Capital Services Co., Ltd.. Mr. Huang graduated from the Department of Accounting of Institute of Fiscal Science of the Ministry of Finance with a postgraduate degree of master in economics. He is a professor-level senior accountant.



WANG Kui, aged 54, is the Director of the Company, the Deputy Chief Economist and the Chief of the Planning and Development Department of Huaneng Group and the Director of North United Power Co., Ltd.. He previously served as the Chief of the Planning and Development Department of Huaneng Group. He graduated from Beijing University of Economics with a major in quantitative economics. He holds an EMBA degree from Guanghua School of Management of Peking University. He is a professor-level senior engineer.

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT



LU Fei, aged 57, is the Director of the Company, the Deputy Chief Economist of Huaneng Group and Chairman of the Supervisory Board of Huaneng Renewables Corporation Limited. He previously served as the Director of Operation Coordination Department, the Director of Sales and Marketing Department and the Director of Budget and Comprehensive Planning Department of Huaneng Group. He graduated from Zhejiang University with a major in thermal power engineering, and holds an EMBA degree from School of Economics and Management of Tsinghua University. He is a professor-level senior engineer.



TENG Yu, aged 58, is the Director of the Company, the Deputy Chief Accountant of Huaneng Group, the Director of China Huaneng Finance Corporation Limited, the Director of Huaneng Capital Services Co., Ltd. and the Director of North United Power Co., Ltd.. He also served as the Director of Finance Department of Huaneng Group. He graduated from the Party School of the Central Committee of Communist Party with a degree majoring in economic management. He is a professor-level senior accountant.



MI Dabin, aged 53, is the Director of the Company, Vice Chairman, the President, Deputy Party Secretary of Hebei Construction & Investment Group Co., Ltd., and the Chairman of Huihai Financing and Leasing Co., Ltd.. He was the President and Chairman of Hebei Construction& Energy Investment Co., Ltd., the Chief Engineer, Vice President and President of Qinhuangdao Power Generation Co., Ltd., the President of Qinhuangdao Thermal Power Generation Co., Ltd., the Chairman of Hebei Xingtai Power Generation Limited, an assistant to the President and the Head of Production and Operation Department of Hebei Construction & Investment Group Co., Ltd., the President of Qinhuangdao Power Generation Co., Ltd. and the President of Qinhuangdao Thermal Power Generation Co., Ltd.. He graduated from North China Electric Power University, majoring in power engineering, and holds a master's degree. He is a senior engineer.



CHENG Heng, aged 58, is a Director of the Company, the Vice President (group department president level) of the Energy Department of Jiangsu Guoxin Investment Group Limited, the Vice Chairman of Jiangsu Changshu Electric Power Generating Company Limited, the Vice Chairman of Jiangsu Ligang Electric Power Co., Ltd., and the Vice Chairman of Yangcheng International Electric Power Co., Ltd.. He previously served as the deputy manager of the Planning Department of Jiangsu International Trust and Investment Corporation, Vice President of Changshu Power Generation Co., Ltd., President of Energy Investment Division 2 of Jiangsu Provincial Investment Management Co., Ltd., and the Vice President of Jiangsu Provincial Investment Management Co., Ltd.. He is a university graduate with College education and an economist.



LI Haifeng, aged 42, is a Director of the Company, the secretary of the party committee and chairman of Liaoning Energy Investment (Group) Co., Ltd.. He previously served as the deputy secretary of the party committee, deputy chairman and president of Liaoning Energy Investment (Group) Co., Ltd.. He graduated from Tsinghua University, majoring in materials science and engineering, post-graduate qualification, and a doctorate degree in engineering. He is a professor-level senior engineer.



LIN Chong, aged 58, is a Director of the Company, a Member of Party Committee and the Vice President of Fujian Investment & Development Group Co., Ltd., the Vice Chairman of Fujian Sanming Nuclear Power Co., Ltd., the Vice Chairman of Chinalco Southeast Copper Co., Ltd., the director of Fujian Motor Industry Group Co., Ltd. and the director of Fujian Fuqing Nuclear Power Co., Ltd.. He also served as the Chairman of Fujian Zhongmin Energy Investment Co., Ltd., the Vice Chairman of CNOOC Fujian Natural Gas Co. Ltd., the Vice Chairman of Zhonghai Mintou (Fujian) Natural Gas Pipeline Co., Ltd. (中海閩投(福建)天然氣管道有限公司), the Vice Chairman of CNOOC Fujian Zhangzhou Natural Gas Company Limited and the director of King Long Motor Group. He graduated from Chongqing University where he majored in electric power system and its automation and holds a master's degree of science in engineering (postgraduate diploma). Mr. Lin is a senior engineer.



XU Mengzhou, aged 71, is an Independent Director of the Company, an Independent Director of Shandong Hualu-Hengsheng Chemical Co., Ltd., an Independent Director of iHandy Group (non-listed company), and vice chairman of the Banking Law Research Institute of China Law Society. He served as a professor of Law School of Renmin University of China (RUC). He graduated from the RUC, with a doctor's degree in Economic Laws.



LIU Jizhen, aged 70, is an Independent Director of the Company, an academician of the Chinese Academy of Engineering, a Director of the National Key Laboratory of New Energy Power System of North China Electric Power University, a chief scientist of the 973 Program, the Vice President of the China Electricity Council, a fellow of the Institution of Engineering and Technology (FIET) and an independent director of Datang International Power Generation Co., Ltd.. Mr. Liu was formerly the President of Wuhan University of Hydraulic and Electrical Engineering, the President of North China Electric Power University, the Vice President of the Chinese Society for Electrical Engineering and the Vice President of the Chinese Society of Power Engineering. He is a professor and a doctoral supervisor.

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT



XU Haifeng, aged 66, is an Independent Director of the Company. He successively served as the Chairman and President of China Railway Express Co., Ltd., the director and Vice President of Beijing-Shanghai High Speed Railway Co., Ltd., the Managing Commander-in-Chief of the General Headquarters for the Construction of Beijing-Shanghai High Speed Railway of the Ministry of Railways, and the Vice Chairman and President of Beijing-Shanghai High Speed Railway Co., Ltd.. He graduated from Beijing Jiaotong University where he majored in transportation organization and automation. He has an EMBA degree from the Guanghua School of Management of Peking University and holds a master's degree.



ZHANG Xianzhi, aged 64, is an Independent Director of the Company, a professor and a doctoral supervisor of Dongbei University of Finance and Economics and a national level outstanding teacher. He is serving concurrently as a managerial accounting consultant to the Ministry of Finance, independent director at Yingkou Port Liability Co., Ltd. and Lingyuan Iron & Steel Co., Ltd. (凌源鋼鐵股份有限公司). Mr. Zhang was formerly an accountant of Dalian City Transportation Bureau, a researcher of Dalian Economic Commission, vice dean of the accounting school of Dongbei University of Finance and Economics, and director of Sino-German Management and Control Research Centre, etc.. He graduated from Dongbei University of Finance and Economics and holds a bachelor's degree and master's degree in accounting and holds a doctorate degree in industrial economics.



XIA Qing, aged 64, is currently an Independent Director of the Company, a professor in Tsinghua University, Member of the China Energy Research Council, the Expert of the National Electricity Exchange Agency Alliance, the Expert of China Southern Power Grid Corporation, the Expert of China Datang Power Generation Group, the Expert of State Grid NARI Group, the Deputy Director of the Power Market Special Committee of China Electrical Engineering Society, the Deputy Chairman of China Power Reform Forum, the Deputy Chairman of the Energy Storage Committee of the China Energy Research Association, the Independent Director of Tellhow Sci-tech Co., Ltd., the Independent Director of State Grid Yingda Co., Ltd. and the Independent Director of Beijing E-techstar Co., Ltd.. He previously served as the Independent Director of the Eighth Session of Board of Directors of the Company. He graduated from Tsinghua University with a doctoral degree in power system and automation.

Supervisors



LI Shuqing, aged 58, is currently the Chairman of the Supervisory Committee of the Company, the Deputy Chief Engineer of Huaneng Group, the Chairman and the Secretary of Communist Party Committee of HIPDC. He previously served as the Vice President of the Company, the Executive Director and the President of Huaneng Hulunbuir Energy Development Co., Ltd., the Chairman and the Secretary of Communist Party Committee of Huaneng Shandong Power Generation Co., Ltd.. He holds an EMBA degree from Guanghua School of Management of Peking University. He is a professor-level senior engineer.



MU Xuan, aged 46, is the Vice Chairman of the Supervisory Committee of the Company, the Vice President and a Member of Party Committee of Dalian City Investment Holding Group Co., Ltd., the Chairman and President of Dalian LNG Pipeline Co., Ltd.. He was the assistant to the President of Dalian Construction Investment Co., Ltd. and the assistant to the President of Dalian Construction Investment Group Co., Ltd.. He graduated from Dongbei University of finance and Economics, majoring in technical economy and management. He is a master degree postgraduate and a registered accountant.



GU Jianguo, aged 55, is a Supervisor of the Company, the Chairman of Nantong Investment & Management Limited Company, and Vice Chairman and the President of Nantong Industries Holdings Group Limited. He was the Chief of Nantong Investment Management Centre, Director and President of Nantong Investment & Management Limited Company. He graduated from Nanjing University of Aeronautics and Astronautics with a bachelor's degree. He is an economist. He holds a Master of Business Administration from Antai College of Economics and Management (ACEM) at Shanghai Jiao Tong University.

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT



XIA Aidong, aged 53, is a Supervisor of the Company, the Director of the Audit Department and the Audit Center of Huaneng Group, the Chairman of the Supervisory Committee of Huaneng Capital Services Co., Ltd., a director of China Huaneng Finance Corporation Limited, a supervisor of North United Power Co., Ltd., the Chairman of the Supervisory Committee of Huaneng Lancang River Hydroppwer Inc. and a supervisor of Guangdong Energy Group Co., Ltd. He previously served as the manager of the Budget Department of the Company and the Deputy Chief of the Budget and Comprehensive Planning Department of Huaneng Group. He graduated from Beijing Business School, majoring in accounting and obtained a bachelor's degree in Economics. He is a professor-level senior accountant.



XU Jianping, aged 53, is a Supervisor and an assistant to the President of the Company. He previously served as deputy manager, manager and director of the Human Resources Department and a director of the Party Work Department (Human Resources Department) of the Company. He graduated from Huazhong University of Science and Technology, majoring in thermal power engineering, and obtained a Master's degree in Economics in Finance from Zhongnan University of Economics and Law. He is a senior engineer.



ZHU Tong, aged 50, is currently a Supervisor, the Director of the Party Work Department (Human Resources Department) of the Company. He served as Chief of the Personnel Division of the Human Resources Department of the Company, and Deputy Director of the Party Work Department (Human Resources Department). He graduated from North China Electric Power University with a master degree in industrial engineering. He is a senior engineer.

Biographies of Senior Management



ZHAO Ping, aged 59, is the director, President and the Deputy Party Secretary of the Company. He was the Vice President and the Deputy Party Secretary of the Company. He graduated from Tsinghua University, majoring in thermal engineering, is a postgraduate with a master's degree in science. He is a professor-level senior engineer. He is receiving special government allowance of the State Council.



HUANG Lixin, aged 55, is currently the Chief accountant and a Member of Party Committee of the Company. He was the deputy manager and manager of the Finance Department of the Company and the director of Finance Department of Huaneng Group. He graduated from the Economic Management School of Tsinghua University with an EMBA degree. He is a professor-level senior accountant.



DUAN Rui, aged 54, is the secretary of the Discipline & Inspection Commission and the member of the Party Committee of the Company. He was leader of the Inspection Team of Huaneng Group and deputy director of the Department of Supervision, a member of the Discipline Inspection Group of Party Group, deputy secretary of directly affiliated party committee, the secretary of the Discipline Inspection Commission, a member of the party committee of HIPDC and secretary of the Discipline Inspection Commission. He majored in the economic management and graduated from the Party School of the Inner Mongolia Autonomous Region with a master degree. He is a senior political engineer.



HUANG Chaoquan, aged 56, is currently the Vice President, a Member of Party Committee, the Secretary to the Board of the Company. He was the Manager of the Corporate Management Department and director of the Administration Department of the Company. He graduated from Harbin University of Science and Technology with a postgraduate degree in Management Engineering. He is a professor-level senior economist.

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT



LIU Wei, aged 58, is currently the chief engineer and a member of the Party Committee of the Company. He was the Party Secretary, Chairman of Xi' an Thermal Power Research Institute Co., Ltd., Executive Director and Director of Huaneng Group Technology Innovation Center Co., Ltd.. He graduated from a Northeast Electric Power University of power plant engineering major with post–graduate degree, master of engineering, EMBA of the Cheung Kong Graduate School of Business. He is a researcher-level senior engineer. He is receiving a special government allowance of the State Council.



CHEN Shuping, aged 58, is currently the Vice President and a Member of Party committee of the Company. He was the Director of Material Department, Director of Purchasing Department and Director of Construction Department of Huaneng Group. He graduated from water conservancy and hydropower engineering construction major of Dalian University of Technology with a college degree, bachelor of engineering. He is a professor-level senior engineer.



FU Qiyang, aged 58, is currently the Chief Economist and Member of Party Committee of the Company. He was the Manager of Marketing Department of the Company, President and Party Secretary of Huaneng Hunan Branch. He graduated from the Business and administration Major of University of Science and Technology Beijing, and the University of Texas at Arlington with an EMBA degree. He is a professor-level senior accountant.

Profiles of Resigned Directors, Supervisors and Senior Management



LIU Ranxing, aged 59, was the Vice President, a Member of Party Committee and the Secretary of the Discipline Inspection commission of the Company during the reporting period. He graduated from Harbin Institute of Technology, majoring in management engineering, with a master's degree in science. He is a professor-level senior engineer.



YE Cai, aged 54, was the Supervisor of the Company, a director, the President and the Deputy Secretary of Party Committee of Huaneng Capital Services Co., Ltd. during the reporting period. He previously served as the Director of Finance Department and the Director of Audit Department of Huaneng Group. He graduated from Zhongnan University of Finance and Economics with a major in accounting and holds an EMBA degree from School of Economics and Management of Tsinghua University. He is a professor-level senior accountant.



ZHANG Xiaojun, aged 55, was a Supervisor of the Company during the reporting period. She was Deputy Manager of the Administration Department and the manager of the Discipline Inspection, Supervision and Audit Department of the Company. She graduated from the Central Party School of the Communist Party of China, majoring in economic management, and holds a bachelor's degree. She is an accountant.

CORPORATE INFORMATION

Legal Address of the Company	Huaneng Building 6 Fuxingmennei Street Xicheng District Beijing The People's Republic of China
Company Secretary	Huang Chaoquan Huaneng Building 6 Fuxingmennei Street Xicheng District Beijing The People's Republic of China
Authorized Representatives	Zhao Keyu Huang Chaoquan
Hong Kong Share Registrar	Hong Kong Registrars Limited Shops 1712-1716 17th Floor, Hopewell Centre 183 Queen's Road East Hong Kong
Depository	The Bank of New York Mellon Investor Relations P. O. Box 11258 Church Street Station New York NY 10286-1258 USA

LEGAL ADVISERS TO THE COMPANY

As to Hong Kong law	Herbert Smith Freehills 23rd Floor, Gloucester Tower 15 Queen's Road Central Central, Hong Kong
As to PRC law	Haiwen & Partners 20th Floor, Fortune Finance Center No.5 Dong San Huan Central Road Chaoyang District Beijing The People's Republic of China
As to US law	Skadden, Arps, Slate, Meagher & Flom 42/F, Edinburgh Tower The Landmark 15 Queen's Road Central Central Hong Kong

AUDITORS OF THE COMPANY

Domestic and U.S. 20F Annual Report Auditors	Ernst & Young Hua Ming LLP 16/F, Ernst & Young Tower Oriental Plaza 1 East Chang'an Avenue Dongcheng District Beijing The PRC Post Code: 100738
Hong Kong Auditors	Ernst & Young *Certified Public Accountants* *Registered Public Interest Entity Auditor* 27/F, One Taikoo Place 979 King's Road Quarry Bay, Hong Kong

LISTING INFORMATION

H Shares:	The Stock Exchange of Hong Kong Limited Stock Code: 902
ADSs:	The New York Stock Exchange, Inc. Ticker Symbol: HNP
A Shares:	Shanghai Stock Exchange Stock Code: 600011

PUBLICATIONS

The Company's report on interim results and the annual report (A share version and H share version) was published in August 2021 and will be published in April 2022, respectively. As required by the United States securities laws, the Company will file an annual report in Form 20-F with the Securities and Exchange Commission of the U.S. before 30 April 2022. As the Company's A shares have already been issued and listed, the Company shall, in compliance of the relevant regulations of the China Securities Regulatory Commission and the Shanghai Stock Exchange, prepare quarterly reports. Copies of the interim and annual reports as well as the Form 20-F, once filed, will be available at:

Beijing:	Huaneng Power International, Inc. Huaneng Building 6 Fuxingmennei Street Xicheng District Beijing The People's Republic of China Tel: (8610)-6322 6999 Fax: (8610)-6322 6888 Website: http://www.hpi.com.cn
Hong Kong:	Wonderful Sky Financial Group Limited 9th Floor, The Center 99 Queen's Road Central Hong Kong Tel: (852) 2851 1038 Fax: (852) 2815 1352
The website of the Company:	http://www.hpi.com.cn

GLOSSARY

Equivalent Availability Factor (EAF):	Percentage on duration of usable hours on generating units in period hour, i.e. $EAF = \frac{\text{Available Hours (AH)} - \text{Equivalent Unit Derated Hours (EUNDH)}}{\text{Period Hour (PH)}} \times 100\%$
Gross Capacity Factor (GCF):	$GCF = \frac{\text{Gross Actual Generation (GAAG)}}{\text{Period Hour (PH)} \times \text{Gross Maximum Capacity (GMC)}} \times 100\%$
Weighted Average Coal Consumption Rate for Power Sold:	The standard of measurement on average consumption of coal for the production of every one kWh of electricity from a coal-fired generating unit. Unit: gram/kWh or g/kWh.
Weighted Average Coal Consumption Rate for Power Generated:	The standard of measurement on average consumption of coal for the generation of every one kWh of electricity from a coal-fired generating unit. Unit: gram/kWh or g/kWh.
Weighted Average House Consumption:	The rate of electricity consumption during power production versus power generating unit: %.
Utilization Hour:	The operation hour coefficient converted from actual gross power generation of generating units to maximum gross capacity (or fixed capacity).
Capacity Rate:	Ratio between average capacity and maximum capacity which indicates the difference in capacity. The larger the ratio, the more balanced the power production, and the higher the utilization of facilities.
Power Generation:	Electricity generated by power plants (generating units) during the Reporting Period, or "power generation". It refers to the consumed generated electricity produced by generating units with power energy being processed and transferred, or the product of actual consumed electricity generated by generating units and actual operation hours of generating units.

GW: Unit of power generation, = 10^9W, gigawatt
MW: = 10^6W, megawatt
kW: = 10^3W, kilowatt
kWh: Unit of power, kilowatt hour

INDEPENDENT AUDITOR'S REPORT

Ernst & Young
27/F, One Taikoo Place
979 King's Road
Quarry Bay, Hong Kong

安永會計師事務所
香港鰂魚涌英皇道979號
太古坊一座27樓

Tel 電話: +852 2846 9888
Fax 傳真: +852 2868 4432
ey.com

To the shareholders of Huaneng Power International, Inc.
(Incorporated in the People's Republic of China with limited liability)

OPINION

We have audited the consolidated financial statements of Huaneng Power International, Inc. (the "Company") and its subsidiaries (the "Group") set out on pages 112 to 309, which comprise the consolidated statement of financial position as at 31 December 2021, and the consolidated statement of comprehensive income, the consolidated statement of changes in equity and the consolidated statement of cash flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements give a true and fair view of the consolidated financial position of the Group as at 31 December 2021, and of its consolidated financial performance and its consolidated cash flows for the year then ended in accordance with International Financial Reporting Standards ("IFRSs") issued by the International Accounting Standards Board ("IASB") and have been properly prepared in compliance with the disclosure requirements of the Hong Kong Companies Ordinance.

BASIS FOR OPINION

We conducted our audit in accordance with International Standards on Auditing ("ISAs") issued by the International Auditing and Assurance Standards Board ("IAASB"). Our responsibilities under those standards are further described in the *Auditor's responsibilities for the audit of the consolidated financial statements* section of our report. We are independent of the Group in accordance with the *Code of Ethics for Professional Accountants* (the "Code") issued by the Hong Kong Institute of Certified Public Accountants, and we have fulfilled our other ethical responsibilities in accordance with the Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

KEY AUDIT MATTERS

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters. For each matter below, our description of how our audit addressed the matter is provided in that context.

We have fulfilled the responsibilities described in the *Auditor's responsibilities for the audit of the consolidated financial statements* section of our report, including in relation to these matters. Accordingly, our audit included the performance of procedures designed to respond to our assessment of the risks of material misstatement of the consolidated financial statements. The results of our audit procedures, including the procedures performed to address the matters below, provide the basis for our audit opinion on the accompanying consolidated financial statements.

INDEPENDENT AUDITOR'S REPORT

KEY AUDIT MATTERS *(Cont'd)*

Key audit matter	How our audit addressed the key audit matter
Impairment of property, plant and equipment	
At 31 December 2021, the Group held property, plant and equipment ("PPE") with the amount of RMB320,590 million, contributed 78.5% of the Group's total non-current assets. As described in Notes 2(g), 2(l), 4(b) and 7 to the consolidated financial statements, the Group is required to review PPE for impairment whenever events or changes in circumstances indicate that their carrying amounts may not be recoverable. Management performed an impairment assessment on such PPE by determining the recoverable amounts of the cash-generating units ("CGUs") that the PPE are allocated to. As a result of the impairment assessment, impairment losses of RMB29 million were recognised for the year ended 31 December 2021. Auditing management's impairment assessment of PPE was complex due to the significant estimates and judgments involved in the projections of future cash flows, including the future sales volumes, fuel prices and discount rates applied to these forecasted future cash flows. These estimates and judgments may be significantly affected by changes in future market or economic conditions.	We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the PPE impairment assessment process including tests of controls over management's review of the significant assumptions used in the impairment assessment. Among other audit procedures performed, we evaluated management's assessment of impairment indicators, compared the methodology used by the Group to industry practice and tested the completeness and accuracy of the underlying data used in the projections. We also assessed the significant assumptions used in the calculations, which included, amongst others, the future sales volumes, fuel prices, and discount rates. We compared fuel prices to external industry outlook reports and analysed the history of management's estimates. In addition, we involved our valuation specialists to assist us with assessing the valuation methodologies and the assumptions used, including the discount rates. We evaluated the sensitivity of the significant assumptions described above by assessing the changes to the recoverable amounts of the CGUs resulting from changes in these assumptions. We also assessed the adequacy of the Group's disclosures regarding the impairment assessment.

KEY AUDIT MATTERS *(Cont'd)*

Key audit matter	How our audit addressed the key audit matter
Impairment of goodwill	
At 31 December 2021, the Group's goodwill was RMB14,276 million. As described in Notes 2(k), 2(l), 4(a) and 14 to the consolidated financial statements, the Group is required to, at least annually, perform impairment assessments of goodwill. Goodwill was allocated to each CGU or groups of CGUs. A goodwill impairment loss is recognised if the carrying amount of the CGU exceeds its recoverable amount. As a result of the impairment assessment, no impairment losses were recognised for the year ended 31 December 2021. Auditing management's goodwill impairment assessment was complex because the determination of the recoverable amount of the underlying CGUs involves significant estimates and judgments, including the future sales volumes, fuel prices, gross margin and terminal growth rate used to estimate future cash flows and discount rates applied to these forecasted future cash flows of the underlying CGUs. These estimates and judgments may be significantly affected by changes in future market or economic conditions.	We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the impairment assessment process, including testing controls over management's review of the key assumptions used in the goodwill impairment assessment. Among other audit procedures performed, we compared the methodology used by the Group to industry practice, and tested the completeness and accuracy of the underlying data used in the forecast. We evaluated management's key assumptions used in the calculations, which included, amongst others, the future sales volumes, fuel prices, gross margin, terminal growth rate, and discount rates. We compared fuel prices to external industry outlook reports and analysed the history of management's estimates. In addition, we involved our valuation specialists to assist us with assessing the valuation methodologies and the assumptions used, including the discount rates. We evaluated the sensitivity of the key assumptions described above by assessing the changes to the recoverable amounts of the underlying CGUs resulting from changes in these assumptions. We also assessed the adequacy of the Group's disclosures regarding the impairment assessment.

INDEPENDENT AUDITOR'S REPORT

KEY AUDIT MATTERS *(Cont'd)*

Key audit matter	How our audit addressed the key audit matter
Recognition of deferred tax assets	
At 31 December 2021, the Group had deferred tax assets of RMB6,302 million from deductible temporary differences and tax losses carried forward before offsetting. At 31 December 2021, the Group did not recognise deferred tax assets related to deductible temporary differences of RMB16,076 million and unused tax losses of RMB19,919 million. As described in Notes 2(w)(iii), 4(c) and 31 to the consolidated financial statements, the Group recognised deferred tax assets to the extent that it is probable that future taxable profits and taxable temporary difference will be available to utilise the deductible temporary differences and tax losses carried forward. Auditing management's recognition of deferred tax assets is complex because it requires significant estimation and judgment to evaluate management's significant assumptions, including future taxable profits, future tax rates, the reversal of deductible and taxable temporary differences, and the possible utilisation of tax losses carried forward that could be significantly affected by changes in tax law framework and future market or economic conditions.	We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the recognition of deferred tax assets, including testing controls over management's review of the significant assumptions used in the taxable profit forecast. Among other audit procedures performed, we compared the future tax rates, the deductible and taxable temporary differences, and the possible utilisation of tax losses carried forward, with the tax law framework. We recalculated the Group's utilisation of tax losses carried forward and reversal of deductible temporary differences in management's calculation and compared these amounts to the taxable profit and taxable temporary differences for the respective year. Further, we evaluated management's significant assumptions in determining the future available taxable profits, for example, the future sales volumes, and fuel prices. We compared fuel prices to external industry outlook reports and analysed the history of management's estimates. We also tested the completeness and accuracy of the underlying data used in the taxable profit forecast, and compared management's assumptions described above to the assumptions that management used to perform the impairment assessment of PPE and goodwill. In addition, we involved our tax professionals to assist us in evaluating the technical merits from a tax perspective of management's analysis. We also assessed the adequacy of the Group's disclosures regarding the deferred tax assets.

OTHER INFORMATION INCLUDED IN THE ANNUAL REPORT

The directors of the Company are responsible for the other information. The other information comprises the information included in the Annual Report, other than the consolidated financial statements and our auditor's report thereon.

Our opinion on the consolidated financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

RESPONSIBILITIES OF THE DIRECTORS FOR THE CONSOLIDATED FINANCIAL STATEMENTS

The directors of the Company are responsible for the preparation of the consolidated financial statements that give a true and fair view in accordance with IFRSs issued by the IASB and the disclosure requirements of the Hong Kong Companies Ordinance, and for such internal control as the directors determine is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the directors of the Company are responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors of the Company either intend to liquidate the Group or to cease operations or have no realistic alternative but to do so.

The directors of the Company are assisted by the Audit Committee in discharging their responsibilities for overseeing the Group's financial reporting process.

AUDITOR'S RESPONSIBILITIES FOR THE AUDIT OF THE CONSOLIDATED FINANCIAL STATEMENTS

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Our report is made solely to you, as a body, and for no other purpose. We do not assume responsibility towards or accept liability to any other person for the contents of this report.

INDEPENDENT AUDITOR'S REPORT

AUDITOR'S RESPONSIBILITIES FOR THE AUDIT OF THE CONSOLIDATED FINANCIAL STATEMENTS *(Cont'd)*

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with ISAs, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the directors.

- Conclude on the appropriateness of the directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

AUDITOR'S RESPONSIBILITIES FOR THE AUDIT OF THE CONSOLIDATED FINANCIAL STATEMENTS *(Cont'd)*

We communicate with the Audit Committee regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide the Audit Committee with a statement that we have complied with relevant ethical requirements regarding independence and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, actions taken to eliminate threats or safeguards applied.

From the matters communicated with the Audit Committee, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditor's report is Cheong Ming Yik.

Ernst & Young
Certified Public Accountants
Hong Kong

22 March 2022

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB, except per share data)

		For the year ended 31 December	
	Note	2021	2020
Operating revenue	5	**204,605,083**	169,446,338
Tax and levies on operations		**(1,686,341)**	(1,794,004)
Operating expenses, net			
Fuel		**(146,539,362)**	(88,966,304)
Maintenance		**(4,503,584)**	(5,001,982)
Depreciation	6	**(22,270,421)**	(22,146,316)
Labour	37	**(16,107,285)**	(14,503,290)
Service fees on transmission and transformer facilities of HIPDC		**(47,947)**	(95,894)
Purchase of electricity		**(9,114,851)**	(4,720,261)
Others, net	6	**(11,702,778)**	(20,300,072)
Total operating expenses		**(210,286,228)**	(155,734,119)
(Loss)/profit from operations		**(7,367,486)**	11,918,215
Interest income		**288,291**	292,724
Financial expenses, net			
Interest expense	6	**(8,798,200)**	(9,200,612)
Exchange (loss)/gain and bank charges, net		**(40,290)**	100,643
Total financial expenses, net		**(8,838,490)**	(9,099,969)
Share of profits less losses of associates and joint ventures	8	**804,386**	1,774,322
Loss on fair value changes of financial assets/liabilities	6	**–**	(1,566)
Other investment loss		**(7,345)**	(109,990)
(Loss)/profit before income tax expense	6	**(15,120,644)**	4,773,736
Income tax expense	33	**1,929,755**	(2,163,173)
Net (loss)/profit		**(13,190,889)**	2,610,563

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

	For the year ended 31 December	
	2021	2020
Other comprehensive loss, net of tax		
Items that will not be reclassified to profit or loss in subsequent periods:		
Fair value changes of other equity instrument investments	**(46,808)**	(175,984)
Share of other comprehensive loss of joint ventures and associates	**(42,863)**	(178,501)
Income tax effect	**12,231**	43,996
Items that may be reclassified subsequently to profit or loss:		
Share of other comprehensive loss of joint ventures and associates	**(1,441)**	(4,348)
Cash flow hedges:		
Effective portion of changes in fair value of hedging instruments arising during the year	**1,235,874**	(166,323)
Reclassification adjustments for (losses)/gains included in profit or loss	**(624,876)**	414,821
Exchange differences on translation of foreign operations	**(989,932)**	(862,454)
Income tax effect	**(103,870)**	(42,245)
Other comprehensive loss, net of tax	**(561,685)**	(971,038)
Total comprehensive (loss)/income	**(13,752,574)**	1,639,525

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB, except per share data)

		For the year ended 31 December	
	Note	2021	2020
Net (loss)/profit attributable to:			
– Equity holders of the Company		(10,636,194)	2,377,851
– Non-controlling interests		(2,554,695)	232,712
		(13,190,889)	2,610,563
Total comprehensive (loss)/income attributable to:			
– Equity holders of the Company		(10,933,871)	1,599,471
– Non-controlling interests		(2,818,703)	40,054
		(13,752,574)	1,639,525
(Losses)/earnings per share attributable to the shareholders of the Company (expressed in RMB per share)			
– Basic and diluted	34	(0.81)	0.04

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

AS AT 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Note	As at 31 December 2021	2020
ASSETS			
Non-current assets			
Property, plant and equipment	7	**320,589,625**	300,171,142
Right-of-use assets	41	**19,603,927**	18,292,074
Investments in associates and joint ventures	8	**23,037,904**	22,375,377
Investment properties		**635,268**	647,471
Other equity instrument investments	10	**729,070**	664,946
Power generation licence	11	**3,783,756**	3,954,983
Mining rights	12	**1,611,486**	1,611,486
Deferred income tax assets	31	**4,907,081**	2,699,395
Derivative financial assets	13	**69,753**	74,554
Goodwill	14	**14,276,224**	14,738,016
Other non-current assets	15	**19,056,005**	18,537,583
Total non-current assets		**408,300,099**	383,767,027
Current assets			
Inventories	16	**16,824,431**	6,602,459
Other receivables and assets	17	**14,698,932**	7,308,077
Accounts and notes receivable	18	**43,877,997**	38,215,715
Contract assets	5(c)	**66,974**	29,678
Derivative financial assets	13	**652,458**	110,179
Bank balances and cash	35	**16,350,332**	13,871,523
Total current assets		**92,471,124**	66,137,631
Total assets		**500,771,223**	449,904,658

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

AS AT 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Note	As at 31 December 2021	2020
EQUITY AND LIABILITIES			
Capital and reserves attributable to equity holders of the Company			
Share capital	20	**15,698,093**	15,698,093
Other equity instruments	21	**48,417,977**	48,419,779
Capital surplus		**25,667,502**	26,162,550
Surplus reserves	22	**8,140,030**	8,140,030
Currency translation differences		**(1,443,398)**	(738,927)
Retained earnings		**16,567,610**	32,164,398
		113,047,814	129,845,923
Non-controlling interests	40	**20,510,199**	21,770,275
Total equity		**133,558,013**	151,616,198
Non-current liabilities			
Long-term loans	24	**136,857,716**	112,077,395
Long-term bonds	25	**29,396,919**	20,382,405
Lease liabilities	41	**6,138,846**	3,805,635
Deferred income tax liabilities	31	**2,300,088**	3,002,527
Derivative financial liabilities	13	**99,323**	188,139
Other non-current liabilities	26	**6,022,017**	4,784,268
Total non-current liabilities		**180,814,909**	144,240,369

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

	Note	As at 31 December 2021	2020
EQUITY AND LIABILITIES *(Continued)*			
Current liabilities			
Accounts payable and other liabilities	27	**54,609,553**	42,755,361
Contract liabilities	5(c)	**3,274,770**	2,903,296
Taxes payable	28	**2,053,418**	2,044,869
Dividends payable		**1,041,452**	694,854
Derivative financial liabilities	13	**41,034**	106,862
Short-term bonds	29	**8,222,517**	5,002,877
Short-term loans	30	**91,896,725**	66,311,160
Current portion of long-term loans	24	**17,213,799**	19,808,313
Current portion of long-term bonds	25	**7,175,540**	12,678,511
Current portion of lease liabilities	41	**800,521**	1,676,711
Current portion of other non-current liabilities	26	**68,972**	65,277
Total current liabilities		**186,398,301**	154,048,091
Total liabilities		**367,213,210**	298,288,460
Total equity and liabilities		**500,771,223**	449,904,658

These financial statements were approved for issue by the Board of Directors on 22 March 2022 and were signed on its behalf.

Zhao Keyu
Director

Zhao Ping
Director

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Attributable to equity holders of the Company													
			Capital surplus											
	Share capital	Other equity instruments	Share premium	Hedging reserve	Fair value reserve of financial assets at fair value through other comprehensive income	Other reserve in other comprehensive loss	Other capital reserve	Subtotal	Surplus reserves	Currency translation differences	Retained earnings	Total	Non-controlling interests	Total equity
Balance as at 31 December 2020	15,698,093	48,419,779	24,770,682	(77,707)	427,126	(105,910)	1,148,359	26,162,550	8,140,030	(738,927)	32,164,398	129,845,923	21,770,275	151,616,198
Profit/(loss) for the year ended 31 December 2021	-	2,137,420	-	-	-	-	-	-	-	-	(12,773,614)	(10,636,194)	(2,554,695)	(13,190,889)
Other comprehensive income/(loss):														
Fair value changes of other equity investment instruments, net of tax	-	-	-	-	(34,583)	-	-	(34,583)	-	-	-	(34,583)	6	(34,577)
Share of other comprehensive loss of investees – accounted for under the equity method, net of tax	-	-	-	-	(42,863)	(1,441)	-	(44,304)	-	-	-	(44,304)	-	(44,304)
Changes in fair value of effective portion and reclassification of cash flow hedges, net of tax	-	-	-	485,681	-	-	-	485,681	-	-	-	485,681	21,447	507,128
Currency translation differences	-	-	-	-	-	-	-	-	-	(704,471)	-	(704,471)	(285,461)	(989,932)
Total comprehensive income/(loss) for the year ended 31 December 2021	-	2,137,420	-	485,681	(77,446)	(1,441)	-	406,794	-	(704,471)	(12,773,614)	(10,933,871)	(2,818,703)	(13,752,574)

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

	Attributable to equity holders of the Company													
			Capital surplus											
	Share capital	Other equity instruments	Share premium	Hedging reserve	Fair value reserve of financial assets at fair value through other comprehensive income	Other reserve in other comprehensive loss	Other capital reserve	Subtotal	Surplus reserves	Currency translation differences	Retained earnings	Total	Non-controlling interests	Total equity
2020 dividends (Note 23)	-	-	-	-	-	-	-	-	-	-	(2,825,657)	(2,825,657)	(1,020,457)	(3,846,114)
Cumulative distribution of other equity instruments (Note 21)	-	(2,139,222)	-	-	-	-	-	-	-	-	-	(2,139,222)	-	(2,139,222)
Net capital injection from non-controlling interests of subsidiaries	-	-	-	-	-	-	12,358	12,358	-	-	-	12,358	1,864,426	1,876,784
Share of other capital reserve of investees accounted for under the equity method	-	-	-	-	-	-	1,086	1,086	-	-	-	1,086	-	1,086
Acquisition of non-controlling interests of subsidiaries	-	-	-	-	-	-	(915,286)	(915,286)	-	-	-	(915,286)	729,097	(186,189)
Deregistration of a subsidiary	-	-	-	-	-	-	-	-	-	-	-	-	(13,388)	(13,388)
Others	-	-	-	-	-	-	-	-	-	-	2,483	2,483	(1,051)	1,432
Balance as at 31 December 2021	15,698,093	48,417,977	24,770,682	407,974	349,680	(107,351)	246,517	25,667,502	8,140,030	(1,443,398)	16,567,610	113,047,814	20,510,199	133,558,013

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Attributable to equity holders of the Company													
			Capital surplus											
	Share capital	Other equity instruments	Share premium	Hedging reserve	Fair value reserve of financial assets at fair value through other comprehensive income	Other reserve in other comprehensive loss	Other capital reserve	Subtotal	Surplus reserves	Currency translation differences	Retained earnings	Total	Non-controlling interests	Total equity
Balance as at 31 December 2019	15,698,093	25,127,821	24,770,682	(298,249)	737,585	(101,562)	1,106,681	26,215,137	8,140,030	(54,812)	33,677,466	108,803,735	21,575,311	130,379,046
Profit for the year ended 31 December 2020	-	1,770,469	-	-	-	-	-	-	-	-	607,382	2,377,851	232,712	2,610,563
Other comprehensive income/(loss):														
Fair value changes of other equity investment instruments, net of tax	-	-	-	-	(131,958)	-	-	(131,958)	-	-	-	(131,958)	(30)	(131,988)
Share of other comprehensive loss of investees – accounted for under the equity method, net of tax	-	-	-	-	(178,501)	(4,348)	-	(182,849)	-	-	-	(182,849)	-	(182,849)
Changes in fair value of effective portion and reclassification of cash flow hedges, net of tax	-	-	-	220,542	-	-	-	220,542	-	-	-	220,542	(14,289)	206,253
Currency translation differences	-	-	-	-	-	-	-	-	-	(684,115)	-	(684,115)	(178,339)	(862,454)
Total comprehensive income/(loss) for the year ended 31 December 2020	-	1,770,469	-	220,542	(310,459)	(4,348)	-	(94,265)	-	(684,115)	607,382	1,599,471	40,054	1,639,525

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

	Attributable to equity holders of the Company													
			Capital surplus											
	Share capital	Other equity instruments	Share premium	Hedging reserve	Fair value reserve of financial assets at fair value through other comprehensive income	Other reserve in other comprehensive loss	Other capital reserve	Subtotal	Surplus reserves	Currency translation differences	Retained earnings	Total	Non-controlling interests	Total equity
Issue of other equity instruments	-	25,457,450	-	-	-	-	-	-	-	-	-	25,457,450	-	25,457,450
Redemption of other equity instruments	-	(2,499,844)	-	-	-	-	-	-	-	-	(156)	(2,500,000)	-	(2,500,000)
2019 dividends	-	-	-	-	-	-	-	-	-	-	(2,119,243)	(2,119,243)	(1,206,329)	(3,325,572)
Cumulative distribution of other equity instruments	-	(1,436,117)	-	-	-	-	-	-	-	-	-	(1,436,117)	-	(1,436,117)
Net capital injection from non-controlling interests of subsidiaries	-	-	-	-	-	-	34,071	34,071	-	-	-	34,071	1,302,085	1,336,156
Business combination	-	-	-	-	-	-	-	-	-	-	-	-	48,103	48,103
Share of other capital reserve of investees accounted for under the equity method	-	-	-	-	-	-	7,607	7,607	-	-	-	7,607	-	7,607
Others	-	-	-	-	-	-	-	-	-	-	(1,051)	(1,051)	11,051	10,000
Balance as at 31 December 2020	15,698,093	48,419,779	24,770,682	(77,707)	427,126	(105,910)	1,148,359	26,162,550	8,140,030	(738,927)	32,164,398	129,845,923	21,770,275	151,616,198

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Note	For the year ended 31 December 2021	2020
OPERATING ACTIVITIES			
(Loss)/profit before income tax expense		**(15,120,644)**	4,773,736
Adjustments to reconcile (loss)/profit before income tax expense to net cash provided by operating activities:			
Depreciation of property, plant and equipment	6	**21,490,876**	21,337,932
Depreciation of investment properties	6	**30,162**	22,866
Depreciation of right-of-use assets	6	**749,383**	785,518
Provision for impairment losses on property, plant and equipment	6	**28,879**	7,847,378
Provision for impairment of goodwill	6	**–**	685,036
Provision for impairment of other non-current assets	6	**63,000**	349,559
Amortisation of other non-current assets	6	**69,717**	128,177
Recognition of provision for loss allowance of receivables	6	**103,625**	172,711
(Reversal)/recognition of provision for inventory obsolescence	6	**(242)**	43,076
Loss on fair value changes of financial assets/liabilities	6	**–**	1,566
Other investment income		**(7,515)**	(8,585)
Net (gain)/loss on disposals of non-current assets	6	**(520,878)**	626,657
Share of profits less losses of associates and joint ventures	8	**(804,386)**	(1,774,322)
Interest income		**(288,291)**	(292,724)
Interest expense	6	**8,798,200**	9,200,612
Others		**(778,813)**	(648,651)
Changes in working capital:			
Inventories		**(10,216,073)**	2,244,127
Other receivables and assets		**(2,809,293)**	704,927
Accounts and notes receivable		**(6,734,986)**	(6,885,418)
Contract assets		**(139,990)**	(5,521)
Restricted cash		**45,043**	(56,990)
Accounts payable and other liabilities		**11,978,403**	2,343,598
Contract liabilities		**371,474**	196,767
Taxes payable		**1,099,111**	3,177,908
Interest received		**288,291**	292,724
Income tax expense paid		**(1,662,212)**	(3,275,626)
Net cash provided by operating activities		**6,032,841**	41,987,038

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

	Note	For the year ended 31 December 2021	2020
INVESTING ACTIVITIES			
Payment for the purchase of property, plant and equipment		**(43,055,805)**	(42,558,250)
Proceeds from disposal of property, plant and equipment, land use rights and other non-current assets		**514,525**	454,470
Payment for the purchase of other non-current assets		**(47,087)**	(72,699)
Cash dividends received		**796,168**	554,614
Capital injections for investments in associates and joint ventures		**(643,428)**	(586,261)
Cash paid for acquiring other equity instrument investments	3(b)	**(111,313)**	(61,713)
Cash paid for acquiring subsidiaries, net of cash acquired		**–**	(206,414)
Cash received from recovery of entrusted loans		**302,640**	–
Others		**(31,659)**	239,121
Net cash used in investing activities		**(42,275,959)**	(42,237,132)

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

		For the year ended 31 December	
	Note	2021	2020
FINANCING ACTIVITIES			
Issuance of short-term bonds		43,200,000	20,000,000
Repayments of short-term bonds		(40,000,000)	(24,000,000)
Proceeds from short-term loans		139,416,406	116,458,227
Repayments of short-term loans		(113,866,543)	(117,354,380)
Proceeds from long-term loans		62,464,866	52,219,578
Repayments of long-term loans		(39,279,532)	(54,593,490)
Issuance of long-term bonds		15,680,393	4,217,730
Repayments of long-term bonds		(12,000,000)	(2,800,000)
Interest paid		(12,274,217)	(11,586,250)
Net proceeds from the issuance of other equity instruments		–	25,457,450
Redemption of other equity instruments		–	(2,500,000)
Net capital injection from non-controlling interests of subsidiaries		1,876,784	1,155,556
Dividends paid to shareholders of the Company		(2,825,657)	(2,119,243)
Dividends paid to non-controlling interests of subsidiaries		(673,859)	(1,702,511)
Lease payments		(1,860,532)	(1,297,746)
Cash paid for acquisition of non-controlling interests of a subsidiary		(186,189)	–
Others		(285,954)	248,895
Net cash provided by financing activities		39,385,966	1,803,816
Effect of foreign exchange rate changes, net		(845,915)	(739,088)
NET INCREASE IN CASH AND CASH EQUIVALENTS		2,296,933	814,634
Cash and cash equivalents as at beginning of the year		13,257,892	12,443,258
CASH AND CASH EQUIVALENTS AS AT END OF THE YEAR	35	15,554,825	13,257,892

The notes on pages 125 to 309 are an integral part of these consolidated financial statements.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

1 COMPANY ORGANISATION AND PRINCIPAL ACTIVITIES

Huaneng Power International, Inc. (the "Company") was incorporated in the People's Republic of China (the "PRC") as a Sino-foreign joint stock limited company on 30 June 1994. The registered address of the Company is Huaneng Building, 6 Fuxingmennei Street, Xicheng District, Beijing, the PRC. The Company and its subsidiaries (collectively, the "Group") are principally engaged in the generation and sale of electric power to the respective regional or provincial grid companies in the PRC, the Republic of Singapore ("Singapore") and the Islamic Republic of Pakistan ("Pakistan"). The Company conducts its business in Singapore through SinoSing Power Pte Ltd. ("SinoSing Power") and its subsidiaries and in Pakistan through Huaneng Shandong Ruyi (Hong Kong) Energy Co., Ltd. ("Hong Kong Energy") and its subsidiaries.

The directors consider Huaneng International Power Development Corporation ("HIPDC") and China Huaneng Group Co., Ltd. ("Huaneng Group") as controlling shareholders of the Company, with HIPDC being the parent company and Huaneng Group being the ultimate parent company of the Company, respectively. Both HIPDC and Huaneng Group are incorporated in the PRC. HIPDC does not produce financial statements available for public use.

2 PRINCIPAL ACCOUNTING POLICIES

The principal accounting policies adopted in the preparation of these financial statements are set out below. These policies have been consistently applied to all the years presented, unless otherwise stated.

(a) Basis of preparation

These financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRSs") as issued by the International Accounting Standards Board (the "IASB") and the disclosure requirements of the Hong Kong Companies Ordinance. These financial statements also comply with the applicable disclosure provisions of the Rules Governing the Listing of Securities on the Stock Exchange of Hong Kong Limited. These financial statements have been prepared under the historical cost convention, except for the financial assets at fair value through other comprehensive income, financial assets at fair value through profit or loss and derivative financial assets and liabilities.

The preparation of financial statements in conformity with IFRSs requires the use of certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the Group' accounting policies. The areas involving a higher degree of judgement or complexity, or areas where assumptions and estimates are significant to the financial statements are disclosed in Note 4.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(a) Basis of preparation *(Cont'd)*

As at 31 December 2021, the Group had net current liabilities of approximately RMB93.93 billion, and a portion of the Group's funding requirements for capital expenditures were satisfied by short-term financing. Taking into consideration the undrawn available banking facilities exceeded RMB300.0 billion as at 31 December 2021, the Group is expected to refinance certain of its short-term loans and bonds and also to consider alternative sources of financing, where applicable and when needed.

Therefore, the directors of the Company are of the opinion that the Group will be able to meet its liabilities as and when they fall due within the next twelve months and accordingly, these consolidated financial statements are prepared on a going concern basis.

The IASB has issued certain new and revised IFRSs that are first effective or available for early adoption for the current accounting period of the Group. Note 2(b) provides information on any changes in accounting policies resulting from initial application of these developments to the extent that they are relevant to the Group for the current and prior accounting periods reflected in these financial statements.

(b) Changes in accounting policies

The Group has adopted the following revised IFRSs for the first time for the current year's consolidated financial statements.

Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16	*Interest Rate Benchmark Reform – Phase 2*
Amendment to IFRS 16	*Covid-19– Related Rent Concessions beyond 30 June 2021 (early adopted)*

The nature and the impact of the revised IFRSs are described below:

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(b) Changes in accounting policies *(Cont'd)*

(i) Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 *Interest Rate Benchmark Reform – Phase 2*

Amendments to IFRS 9, IAS 39, IFRS 7, IFRS 4 and IFRS 16 address issues not dealt with in the previous amendments which affect financial reporting when an existing interest rate benchmark is replaced with an alternative risk-free rate ("RFR"). The amendments provide a practical expedient to allow the effective interest rate to be updated without adjusting the carrying amount of financial assets and liabilities when accounting for changes in the basis for determining the contractual cash flows of financial assets and liabilities, if the change is a direct consequence of the interest rate benchmark reform and the new basis for determining the contractual cash flows is economically equivalent to the previous basis immediately preceding the change. In addition, the amendments permit changes required by the interest rate benchmark reform to be made to hedge designations and hedge documentation without the hedging relationship being discontinued. Any gains or losses that could arise on transition are dealt with through the normal requirements of IFRS 9 to measure and recognise hedge ineffectiveness. The amendments also provide a temporary relief to entities from having to meet the separately identifiable requirement when an RFR is designated as a risk component. The relief allows an entity, upon designation of the hedge, to assume that the separately identifiable requirement is met, provided the entity reasonably expects the RFR risk component to become separately identifiable within the next 24 months. Furthermore, the amendments require an entity to disclose additional information to enable users of financial statements to understand the effect of interest rate benchmark reform on an entity's financial instruments and risk management strategy. These amendments had no material impact on the consolidated financial statements of the Group.

(ii) Amendment to IFRS 16 *Covid-19– Related Rent Concessions beyond 30 June 2021 (early adopted)*

Amendment to IFRS 16 issued in April 2021 extends the availability of the practical expedient for lessees to elect not to apply lease modification accounting for rent concessions arising as a direct consequence of the covid-19 pandemic by 12 months. Accordingly, the practical expedient applies to rent concessions for which any reduction in lease payments affects only payments originally due on or before 30 June 2022, provided the other conditions for applying the practical expedient are met. The amendment is effective retrospectively for annual periods beginning on or after 1 April 2021 with any cumulative effect of initially applying the amendment recognised as an adjustment to the opening balance of retained profits at the beginning of the current accounting period. Earlier application is permitted. The amendment did not have any impact on the financial position and performance of the Group as there were no lease payments reduced or waived by the lessors as a result of the covid-19 pandemic during the year.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation

The consolidated financial statements include the financial statements of the Company and all of its subsidiaries.

Subsidiaries are investees over which the Group has the power to exercise control. The Group controls an entity when it is exposed, or has rights to variable returns from their involvement with the entity and has the ability to affect those returns through their power over the entity. In assessing whether the Group has power, only substantive rights (held by the Group and other parties) are considered.

When the Group has, directly or indirectly, less than a majority of the voting or similar rights of an investee, the Group considers all relevant facts and circumstances in assessing whether it has power over an investee, including:

(a) the contractual arrangement with the other vote holders of the investee;

(b) rights arising from other contractual arrangements; and

(c) the Group's voting rights and potential voting rights.

When there is any inconsistency on the accounting policies or financial period adopted between subsidiaries and the Company, the financial statements of subsidiaries are adjusted according to the accounting policies or financial period adopted by the Company.

Subsidiaries are consolidated from the date when control is transferred to the Group. They are de-consolidated from the date when control ceases. Intra-group balances, transactions and cash flows, and any unrealised income and expenses arising from intra-group transactions, are eliminated in full in preparing the consolidated financial statements. Unrealised gains arising from transactions with equity accounted investees are eliminated against the investment to the extent of the Group's interest in the investee. Unrealised losses are eliminated in the same way as unrealised gains, but only to the extent that there is no evidence of impairment. The portion of the shareholders' equity of the subsidiaries, which is not attributable directly or indirectly to the parent company, is separately presented as non-controlling interests in the shareholders' equity in the consolidated financial statements.

The Group reassesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control described above. A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction.

If the Group loses control over a subsidiary, it derecognises (i) the assets (including goodwill) and liabilities of the subsidiary, (ii) the carrying amount of any non-controlling interest and (iii) the cumulative translation differences recorded in equity; and recognises (i) the fair value of the consideration received, (ii) the fair value of any investment retained and (iii) any resulting surplus or deficit in profit or loss. The Group's share of components previously recognised in other comprehensive income is reclassified to profit or loss or retained profits, as appropriate, on the same basis as would be required if the Group had directly disposed of the related assets or liabilities.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation *(Cont'd)*

(i) Business combinations

The acquisition method is used to account for the business combinations of the Group (including business combinations under common controls). The consideration transferred for the acquisition of a subsidiary is the fair values of the assets transferred, the liabilities incurred to the former owners of the acquiree and the equity interests issued by the Group. Any contingent consideration is measured at fair value at the date of acquisition. If an obligation to pay contingent consideration that meets the definition of a financial instrument is classified as equity, then it is not remeasured and settlement is accounted for within equity. Otherwise, other contingent consideration is remeasured at fair value at each reporting date and subsequent changes in the fair value of the contingent consideration are recognised in profit or loss. Acquisition-related costs are expensed as incurred. Identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date. On an acquisition-by-acquisition basis, the Group recognises any non-controlling interests in the acquiree either at fair value or at the non-controlling interest's proportionate share of the recognised amounts of acquiree's identifiable net assets. The excess of the consideration transferred, the amount of any non-controlling interest in the acquiree and the acquisition-date fair value of any previous equity interest in the acquiree over the fair value of the identifiable net assets acquired is recorded as goodwill (Note 2(k)). If this consideration is lower than the fair value of the net assets of the subsidiary acquired, the difference is recognised in profit or loss. In a business combination achieved in stages, the acquirer shall remeasure its previously held equity interest in the acquiree at its acquisition-date fair value and recognise the resulting gain or loss, if any, in profit or loss or other comprehensive income, as appropriate. In prior reporting periods, the acquirer may have recognised changes in the value of its equity interest in the acquiree in other comprehensive income. If so, the amount that was recognised in other comprehensive income shall be recognised on the same basis as would be required if the acquirer had directly disposed of the previously held equity interest.

The Group determines that it has acquired a business when the acquired set of activities and assets includes an input and a substantive process that together significantly contribute to the ability to create outputs. The Group may elect to apply, or not apply, an optional test (the concentration test) to permit a simplified assessment of whether an acquired set of activities and assets is not a business, and the Group makes such an election separately for each transaction or other event. The concentration test is met if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets. If the concentration test is met, the set of activities and assets is determined not to be a business and no further assessment is needed. If the concentration test is not met, or if the entity elects not to apply the test, the Group then perform further assessment to determine whether an acquisition meet the minimum requirements to be a business.

When an acquisition does not constitute an integrated set of activities and assets that is capable of being conducted and managed for the purpose of providing goods or services to customers, generating investment income (such as dividends or interest) or generating other income from ordinary activities, it is not defined as a business and therefore is identified as an asset acquisition.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation *(Cont'd)*

(ii) Changes in ownership interests in subsidiaries

Transactions with non-controlling interests that do not result in loss of control are accounted for as equity transactions – that is, as transactions with the equity owners in their capacity as owners. The difference between fair value of any consideration paid and the relevant share acquired of the carrying value of net assets of the subsidiary is recorded in equity. Gains or losses on disposals to non-controlling interests are also recorded in equity.

When the Group loses control of a subsidiary, it is accounted for as a disposal of the entire interest in that subsidiary, with a resulting gain or loss being recognised in profit or loss. Any interest retained in that former subsidiary at the date when control is lost is recognised at fair value and this amount is regarded as the fair value on initial recognition of a financial asset (Note 2(m)) or, when appropriate, the cost on initial recognition of an investment in an associate or joint venture (Note 2(c)(iii)).

(iii) Associates and joint ventures

Associates are investees over which the Group has significant influence on the financial and operating decisions. A joint venture is an arrangement whereby the Group and other parties contractually agree to share control of the arrangement, and have rights to the net assets of the arrangement.

Investments in associates and joint ventures are initially recognised at cost and are subsequently measured using the equity method of accounting, unless it is classified as held for sale (or included in a disposal group that is classified as held for sale). The excess of the initial investment cost over the proportionate share of the fair value of identifiable net assets of investee acquired is included in the initial investment cost (Note 2(k)). Any shortfall of the initial investment cost to the proportionate share of the fair value of identifiable net assets of investee acquired is recognised in the current period profit or loss and long-term investment cost is adjusted accordingly.

When applying the equity method, the Group adjusts net profit or loss of the investees, including the fair value adjustments on the net identifiable assets of the associates and joint ventures and the adjustments to align with the accounting policies of the Company and the Company's financial reporting periods. The current period investment income is then recognised based on the proportionate share of the Group in the investees' net profit or loss. Net losses of investees are recognised to the extent of the carrying value of long-term equity investments and any other constituting long-term equity investments in investees that in substance form part of the investments in the investees. The Group continues to recognise investment losses and provision if they bear additional obligations which meet the recognition criteria.

The Group adjusts the carrying amount of the investment and directly recognises it into related other comprehensive income based on the proportionate share on the movements of the investees' other comprehensive income.

When the investees appropriate profit or declare dividends, the carrying value of long-term equity investments is reduced correspondingly by the proportionate share of the distribution.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation *(Cont'd)*

(iii) Associates and joint ventures *(Cont'd)*

The Group determines at each reporting date whether there is any objective evidence that the investment in the associate or the joint venture is impaired. If this is the case, the Group calculates the amount of impairment as the difference between the recoverable amount of the associate or the joint venture and its carrying value and recognises the amount in the consolidated statement of comprehensive income.

Profits or losses resulting from transactions between the Group and the associates and joint ventures are recognised in the Group's financial statements only to the extent of the unrelated third party investor's interests in the associates and joint ventures. Loss from transactions between the Group and the associates and joint ventures is fully recognised and not eliminated when there is evidence for asset impairment.

If an investment in an associate becomes an investment in a joint venture or vice versa, retained interest is not remeasured. Instead, the investment continues to be accounted for under the equity method.

Gains and losses arising from dilution of investments in associates and joint ventures are recognised in the consolidated statement of comprehensive income.

In the Company's statement of financial position, investments in associates and joint ventures are stated at cost less provision for impairment losses (Note 2(l)) unless classified as held for sale (or included in a disposal group that is classified as held for sale). Investment income from investments in associates and joint ventures is accounted for by the Company based on dividends received and receivable.

In all other cases, when the Group ceases to have significant influence over an associate or joint control over a joint venture, it is accounted for as a disposal of the entire interest in that investee, with a resulting gain or loss being recognised in profit or loss. Any interest retained in that former investee at the date when significant influence or joint control is lost is recognised at fair value and this amount is regarded as the fair value on initial recognition of a financial asset (Note 2(m)).

(d) Separate financial statements of the Company

Investments in subsidiaries are accounted for at cost less impairment unless classified as held for sale (or included in a disposal group that is classified as held for sale). Cost also includes direct attributable costs of investment. Investment income is recognised when the subsidiaries declare dividend.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(e) Segment reporting

The Group determines the operating segment based on the internal organisation structure, management requirement and internal reporting system for purposes of presenting reportable segment information.

An operating segment represents a component of the Group that meets all the conditions below: (i) the component earns revenue and incurs expenses in its daily operating activities; (ii) chief operating decision maker of the Group regularly reviews the operating results of the component in order to make decisions on allocating resources and assessing performance; (iii) the financial position, operating results, cash flows and other related financial information of the component are available. When two or more operating segments exhibit similar economic characteristics and meet certain conditions, the Group combines them as one reportable segment.

(f) Foreign currency translation

(i) Functional and presentation currency

Items included in the financial statements of each of the Group are measured using the currency of the primary economic environment in which the entity operates (the "functional currency"). The consolidated financial statements are presented in Renminbi ("RMB"), which is the Company's functional and presentation currency.

(ii) Transactions and balances

Foreign currency transactions are translated into the functional currency using the spot exchange rate on the transaction dates. As at the end of reporting period, foreign currency monetary items are translated into functional currency at the spot exchange rate as at the end of reporting period. Exchange differences are directly expensed in current period profit or loss unless they arises from foreign currency loans borrowed for purchasing or construction of qualifying assets which is eligible for capitalisation or they arise from monetary items that qualify as hedging instruments in cash flow hedges which are recorded in other comprehensive income to the extent that the hedge is effective.

(iii) Foreign subsidiaries

The operating results and financial position of the foreign subsidiaries are translated into presentation currency as follows:

Asset and liability items in each statement of financial position of foreign operations are translated at the closing rates at the end of reporting period; equity items excluding retained earnings are translated at the spot exchange rates at the date of the transactions. Income and expense items in the statement of comprehensive income of the foreign operations are translated at exchange rates that approximate to those prevailing at the dates of the transactions. All resulting translation differences are recognised in other comprehensive income.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(f) Foreign currency translation *(Cont'd)*

(iii) Foreign subsidiaries *(Cont'd)*

The cash flows denominated in foreign currencies and cash flows of overseas subsidiaries are translated at average exchange rates approximating the rates at the dates when cash flows incurred. The effect of the foreign currency translation on the cash and cash equivalents is presented in the statement of cash flows separately.

On the disposal of a foreign operation (that is, a disposal of the Group's entire interest in a foreign operation, or a disposal involving loss of control over a subsidiary that includes a foreign operation, a disposal involving loss of joint control over a joint ventures that includes a foreign operation, or a disposal involving loss of significant influence over an associate that includes a foreign operation), all of the exchange differences accumulated in equity in respect of that operation attributable to the equity holders of the Company are reclassified to profit or loss.

In the case of a partial disposal that does not result in the Group losing control over a subsidiary that includes a foreign operation, the proportionate share of accumulated exchange differences is re-attributed to non-controlling interests and are not recognised in profit or loss. For all other partial disposals (that is, reductions in the Group's ownership interest in associates or joint venture that includes a foreign operation that do not result in the Group losing significant influence or joint control), the proportionate share of the accumulated exchange differences is reclassified to profit or loss.

(g) Property, plant and equipment

Property, plant and equipment consists of dams, port facilities, buildings, electric utility plant in service, transportation facilities, others and construction-in-progress ("CIP"). Property, plant and equipment acquired or constructed are initially recognised at cost and carried at the net value of cost less accumulated depreciation and accumulated impairment loss, unless classified as held for sale (or included in a disposal group that is classified as held for sale).

Cost of CIP comprises construction expenditures, other expenditures necessary for the purpose of preparing the CIP for its intended use, those borrowing costs incurred before the assets are ready for intended use that are eligible for capitalisation. CIP is not depreciated until such time as the relevant asset is completed and ready for its intended use.

Subsequent costs about property, plant and equipment are included in the asset's carrying amount only when it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognised. Other subsequent expenditures not qualified for capitalisation are charged in the current period profit or loss when they are incurred.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(g) Property, plant and equipment *(Cont'd)*

Depreciation of property, plant and equipment is provided based on book value of the asset less estimated residual value over the estimated useful life using straight-line method. For those impaired property, plant and equipment, depreciation is provided based on book value after deducting impairment provision over the estimated useful life of the asset. The estimated useful lives are as follows:

	Estimated useful lives
Dams	8 – 50 years
Port facilities	20 – 40 years
Buildings	8 – 30 years
Electric utility plant in service	5 – 30 years
Transportation facilities	8 – 27 years
Others	5 – 14 years

Where parts of an item of property, plant and equipment have different useful lives, the cost of the item is allocated on a reasonable basis between the parts and each part is depreciated separately. At the end of each year, the Group reviews the estimated useful lives, residual values and the depreciation method of the property, plant and equipment and make adjustment when necessary.

Property, plant and equipment is derecognised when it is disposed of, or is not expected to bring economic benefit through use or disposal. The amount of disposal proceeds arising from sale, transfer, disposal or write-off of the property, plant and equipment less book value and related tax expenses is recorded in 'operating expenses – others' in the statement of comprehensive income.

The carrying amount of property, plant and equipment is written down immediately to their recoverable amount when their carrying amount is greater than their recoverable amount (Note 2(l)).

(h) Investment property

Investment properties are land and/or buildings which are owned or held under a leasehold interest (Note 2(ab)), including the leasehold property held as a right-of-use asset to earn rental income and/or for capital appreciation. These include land held for a currently undetermined future use and property that is being constructed or developed for future use as investment property.

Investment properties are stated at cost. Rental income from investment properties is accounted for as described in Note 2(z).

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(i) Power generation licence

The Group acquired the power generation licence as part of the business combination with Tuas Power Ltd. ("Tuas Power"). The power generation licence is initially recognised at fair value at the acquisition date. The licence has an indefinite useful life and is not amortised. The assessment that the licence has an indefinite useful life is based on the expected renewal of power generation licence without significant restriction and cost, together with the consideration on related future cash flows generated and the expectation of continuous operations. It is tested annually for impairment and carried at cost less accumulated impairment loss. The useful life of the power generation licence is reviewed by the Group each financial period to determine whether events and circumstances continue to support the indefinite useful life assessment.

(j) Mining rights

Mining rights are stated at cost less accumulated amortisation and impairment losses (Note 2(l)) and are amortised based on the units of production method utilising only recoverable coal reserves as the depletion base, unless the mining rights are classified as held for sale (or included in a disposal group that is classified as held for sale).

(k) Goodwill

Goodwill is initially measured at cost, being the excess of the consideration transferred, the amount of any non-controlling interest in the acquiree and the acquisition-date fair value of any previous equity interest in the acquiree over the fair value of the identifiable net assets acquired and liabilities assumed of the acquiree at the date of acquisition. If the sum of this consideration and other items is lower than the fair value of the net assets acquired, the difference is, after reassessment, recognised in profit or loss as a gain on bargain purchase.

After initial recognition, goodwill is measured at cost less accumulated impairment losses. Goodwill arising on a business combination is allocated to each cash-generating unit, or groups of cash generating units, that is expected to benefit from the synergies of the combination and is tested for impairment annually or more frequent if events or changes in circumstances indicate that the carrying value may be impaired (Note 2(l)).

On disposal of a cash-generating unit during the year, any attributable amount of purchased goodwill is included in the calculation of the profit or loss on disposal.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(l) Impairment of non-financial assets

The carrying amounts of property, plant and equipment, mining rights, intangible assets, right-of-use assets with definite useful lives and long-term equity investments not accounted for as financial assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Goodwill, indefinite life intangible assets and intangible assets not yet available for use are tested for impairment annually regardless of whether there are indications of impairment or more frequently if events or changes in circumstances indicate a potential impairment. An impairment loss is recognised if the carrying amount of an asset or cash-generating unit ("CGU") exceeds its recoverable amount.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less cost to sell. For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGUs. In testing a CGU for impairment, a portion of the carrying amount of a corporate asset (e.g., a headquarters building) is allocated to an individual CGU if it can be allocated on a reasonable and consistent basis or, otherwise, to the smallest group of CGUs.

Subject to an operating segment ceiling test, CGUs to which goodwill has been allocated are aggregated so that the level at which impairment testing is performed reflects the lowest level at which goodwill is monitored for internal reporting purposes.

Goodwill acquired in a business combination is allocated to groups of CGUs that are expected to benefit from the synergies of the combination.

Impairment losses are recognised in profit or loss. Impairment losses recognised in respect of CGUs are allocated first to reduce the carrying amount of any goodwill allocated to the CGU (group of CGUs), and then to reduce the carrying amounts of the other assets in the CGU (group of CGUs) on a pro rata basis, except that the carrying value of an asset will not be reduced below its individual fair value less costs of disposal (if measurable) or value in use (if determinable).

An impairment loss in respect of goodwill is not reversed. Except for goodwill, all impaired non-financial assets are subject to review for possible reversal of impairment at each reporting date. A reversal of an impairment loss is limited to the asset's carrying amount that would have been determined had no impairment loss been recognised in prior years. Reversals of impairment losses are credited to profit or loss in the year in which the reversals are recognised.

(m) Financial instruments

(i) Recognition and initial measurement

All financial assets and financial liabilities are initially recognised when the Group becomes a party to the contractual provisions of the instrument.

A financial asset (unless it is a receivable without a significant financing component) or financial liability is initially measured at fair value plus, for an item not at FVTPL, transaction costs that are directly attributable to its acquisition or issue. A receivable without a significant financing component is initially measured at the transaction price.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(ii) Classification and subsequent measurement of financial assets

(1) Classification of financial assets

On initial recognition, the Group categorises financial assets into three principal classification categories: measured at amortised cost, at fair value through other comprehensive income (FVOCI) and at fair value through profit or loss (FVTPL) based on the business model under which the financial asset is managed and its contractual cash flow characteristics.

Financial assets are not reclassified subsequent to their initial recognition unless the Group changes its business model for managing financial assets, in which case all affected financial assets are reclassified on the first day of the first reporting period following the change in the business model.

An entity's business model refers to how an entity manages its financial assets in order to generate cash flows. The entity's business model determines whether cash flows will result from collecting contractual cash flows, selling financial assets or both. The Group determines the business model for managing the financial assets according to the facts and based on the specific business objective determined by the Group's key management personnel.

On initial recognition of an equity investment that is not held for trading, the Group may make an irrevocable election to designate the investment at FVOCI (non-recycling) such that subsequent changes in fair value are recognised in other comprehensive income. Such elections are made on an instrument-by-instrument basis, but may only be made if the investment meets the definition of equity from the issuer's perspective.

The Group assesses the contractual cash flow characteristics of an financial asset whether contractual cash flows are solely payments of principal and interest("SPPI"). Principal is defined as the fair value of the financial asset on initial recognition. Interest is defined as consideration for the time value of money and for the credit risk associated with the principal amount outstanding during a particular period of time and for other basic lending risks and costs, as well as a profit margin. The Group assesses whether the financial assets contains a contractual term that could change the timing or amount of contractual cash flows such that it would not meet this condition. Financial assets with cash flows that are SPPI are classified and measured at amortised cost.

All financial assets not classified as measured at amortised cost or FVOCI as described in the above are measured at FVTPL. On initial recognition, the Group may irrevocably designate a financial asset that otherwise meets the requirements to be measured at amortised cost or at FVOCI or at FVTPL if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(ii) Classification and subsequent measurement of financial assets *(Cont'd)*

(2) Subsequent measurement of financial assets

– Financial assets at FVTPL

These assets are subsequently measured at fair value. Net gains and losses, including any interest or dividend income, are recognised in profit or loss, unless the financial assets are part of a hedging relationship.

– Financial assets at amortised cost

These assets are subsequently measured at amortised cost using the effective interest method. A gain or loss on a financial asset that is measured at amortised cost and is not part of a hedging relationship shall be recognised in profit or loss when the financial asset is derecognised, through the amortisation process or in order to recognise impairment gains or losses.

– Debt investments at FVOCI

These assets are subsequently measured at fair value. Interest income calculated using the effective interest method, impairment and foreign exchange gains and losses are recognised in profit or loss. Other net gains and losses are recognised in other comprehensive income. On derecognition, gains and losses accumulated in other comprehensive income are reclassified to profit or loss.

– Equity investments at FVOCI

These assets are subsequently measured at fair value. Dividends are recognised as income in profit or loss. Other net gains and losses are recognised in other comprehensive income and are transferred to retained earnings on derecognition.

(iii) Classification and subsequent measurement of financial liabilities

Financial liabilities are classified as measured at FVTPL or measured at amortised cost.

– Financial liabilities at FVTPL

A financial liability is classified as at FVTPL if it is classified as held-for-trading (including derivative financial liability) or it is designated as such on initial recognition.

These liabilities are subsequently measured at fair value and net gains and losses, including any interest expense, are recognised in profit or loss, unless the financial liabilities are part of a hedging relationship.

– Financial liabilities at amortised cost

These liabilities are subsequently measured at amortised cost using the effective interest method.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(iv) Offsetting

Financial assets and financial liabilities are separately presented in the statement of financial position without offsetting. However, financial assets and financial liabilities are offset when, and only when the Group:

– currently has a legally enforceable right to set off the amounts;

– intends either to settle them on a net basis or to realise the asset and settle the liability simultaneously.

(v) Derecognition

The Group derecognises a financial asset when one of the following conditions is met:

– the contractual rights to the cash flows from the financial asset expire;

– the Group transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred; and

– the Group transfers the rights to receive the contractual cash flows in a transaction in which the Group neither transfers nor retains substantially all of the risks and rewards of ownership and does not retain control of the financial asset.

On derecognition of a financial asset in its entirety, the difference between the two amounts below is recognised in profit or loss:

– the carrying amount of the financial asset transferred (measured at the date of derecognition); and

– the consideration received, along with the cumulative gain or loss previously recognised in other comprehensive income, for the part derecognised.

The Group derecognises a financial liability (or part of it) when, and only when, its contractual obligation (or part of it) is discharged or cancelled, or expire.

Continuing involvement that takes the form of a guarantee over the transferred asset is measured at the lower of the original carrying amount of the asset and the maximum amount of consideration that the Group could be required to repay.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(vi) Credit losses

The Group recognises loss allowance for expected credit losses ("ECLs") on the following items:

– financial assets measured at amortised cost;

– contract assets as defined in IFRS 15;

– lease receivables; and

– debt investments measured at FVOCI.

Financial assets measured at fair value, including debt investments or equity investments measured at FVTPL, other equity investments designated at FVOCI (non-recycling) and derivative financial assets, are not subject to the ECL assessment.

Measurement of ECLs

ECLs are a probability-weighted estimate of credit losses. Credit losses are measured as the present value of all expected cash shortfalls (i.e. the difference between the cash flows due to the Group in accordance with the contract and the cash flows that the Group expects to receive).

The maximum period considered when estimating ECLs is the maximum contractual period over which the Group is exposed to credit risk.

In measuring ECLs, the Group takes into account reasonable and supportable information that is available without undue cost or effort. This includes information about past events, current conditions and forecasts of future economic conditions.

ECLs are measured on either of the following bases:

– 12-month ECLs: these are losses that are expected to result from possible default events within the 12 months after the reporting date; and

– lifetime ECLs: these are losses that are expected to result from all possible default events over the expected lives of the items to which the ECL model applies.

Loss allowances for accounts receivable, lease receivables and contract assets are always measured at an amount equal to lifetime ECLs. ECLs on these financial assets are estimated using a provision matrix based on the Group's historical credit loss experience, adjusted for factors that are specific to the debtors and an assessment of both the current and forecast general economic conditions at the reporting date.

For all other financial instruments, the Group recognises a loss allowance equal to 12-month ECLs unless there has been a significant increase in credit risk of the financial instrument since initial recognition or the financial instrument is not determined to have low credit risk at the reporting date, in which cases the loss allowance is measured at an amount equal to lifetime ECLs.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(vi) Credit losses *(Cont'd)*

Low credit risk

If the financial instrument has a low risk of default, the borrower has a strong capacity to meet its contractual cash flow obligations in the near term and adverse changes in economic and business conditions in the longer term may, but will not necessarily, reduce the ability of the borrower to fulfil its contractual cash flow obligations, the credit risk on a financial instrument is considered low.

Significant increases in credit risk

In assessing whether the credit risk of a financial instrument has increased significantly since initial recognition, the Group compares the risk of default occurring on the financial instrument assessed at the reporting date with that assessed at the date of initial recognition. The Group considers both quantitative and qualitative information that is reasonable and supportable, including historical experience and forward-looking information that is available without undue cost or effort.

In particular, the following information is taken into account when assessing whether credit risk has increased significantly since initial recognition:

– failure to make payments of principal or interest on their contractually due dates;

– an actual or expected significant deterioration in a financial instrument's external or internal credit rating (if available);

– an actual or expected significant deterioration in the operating results of the debtor; and

– existing or forecast changes in the technological, market, economic or legal environment that have a significant adverse effect on the debtor's ability to meet its obligation to the Group.

Depending on the nature of the financial instruments, the assessment of a significant increase in credit risk is performed on either an individual basis or a collective basis. When the assessment is performed on a collective basis, the financial instruments are grouped based on shared credit risk characteristics, such as past due status and credit risk ratings.

The Group assumes that the credit risk on a financial asset has increased significantly if it is more than 30 days past due, unless the Group has reasonable and supportable information that is available without undue cost or effort, that demonstrates that the credit risk has not increased significantly since initial recognition even though the contractual payments are more than 30 days past due.

The Group considers a financial asset to be in default when the borrower is unlikely to pay its credit obligations to the Group in full, without recourse by the Group to actions such as realising security (if any is held).

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(vi) Credit losses *(Cont'd)*

Credit-impaired financial assets

At each reporting date, the Group assesses whether financial assets carried at amortised cost and debt investments at FVOCI are credit-impaired. A financial asset is credit-impaired when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred.

Evidence that a financial asset is credit-impaired includes the following observable events:

– significant financial difficulties of the debtor;

– a breach of contract, such as a default or delinquency in interest or principal payments;

– for economic or contractual reasons relating to the borrower's financial difficulty, the Group having granted to the borrower a concession that would not otherwise consider;

– it becoming probable that the borrower will enter into bankruptcy or other financial reorganisation; and

– the disappearance of an active market for that financial asset because of financial difficulties of the issuer.

Presentation of allowance for ECLs

ECLs are remeasured at each reporting date to reflect changes in the financial instrument's credit risk since initial recognition. Any change in the ECL amount is recognised as an impairment gain or loss in profit or loss.

The Group recognises an impairment gain or loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account, except for debt investments that are measured at FVOCI (recycling), for which the loss allowance is recognised in other comprehensive income.

Write-off policy

The gross carrying amount of a financial asset is written off (either partially or in full) to the extent that there is no realistic prospect of recovery. A write-off constitutes a derecognition event. This is generally the case when the Group determines that the debtor does not have assets or sources of income that could generate sufficient cash flows to repay the amounts subject to the write-off. However, financial assets that are written off could still be subject to enforcement activities in order to comply with the Group's procedures for recovery of amounts due.

Subsequent recoveries of an asset that was previously written off are recognised as a reversal of impairment in profit or loss in the period in which the recovery occurs.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(vii) Cash flow hedge

Cash flow hedge is a hedge of the exposure to variability in cash flows that is attributable to a particular risk associated with all, or a component of, a recognised asset or liability or a highly probable forecast transaction, and could affect profit or loss.

The hedged items of cash flow hedge are the designated items with respect to the risks associated with future cash flow changes, and can be reliably measurable. Hedging instruments are designated financial instruments for cash flow hedge whose cash flows are expected to offset changes in the cash flows of a hedged item.

When designating a hedging relationship and on an ongoing basis, the Group shall analyse the sources of hedge ineffectiveness that are expected to affect the hedging relationship during its term. If a hedging relationship ceases to meet the hedging effectiveness requirement relating to the hedge ratio, but the risk management objective for that designated hedging relationship remains the same, the Group shall adjust the hedge ratio of the hedging relationship, so that it meets the qualifying criteria again, which is referred to as rebalancing.

When a derivative is designated as a cash flow hedging instrument, the effective portion of changes in the fair value of the derivative is recognised in other comprehensive income and accumulated in the cash flow hedge reserve. The cash flow hedge reserve is adjusted to the lower of the following:

– the cumulative gain or loss on the hedging instrument from inception of the hedge; and

– the present value of the cumulative change in the hedged expected future cash flows from inception of the hedge.

The portion of the gain or loss on the hedging instrument that is determined to be an effective hedge shall be recognised in other comprehensive income. Any remaining gain or loss on the hedging instrument is hedge ineffectiveness that shall be recognised in profit or loss.

On rebalancing, the hedge ineffectiveness of the hedging relationship is determined and recognised immediately before adjusting the hedging relationship. Adjusting the hedge ratio allows an entity to respond to changes in the relationship between the hedging instrument and the hedged item that arise from their underlying or risk variables. The Group adjusts the hedge ratio by increasing the volume of the hedged items or hedging instruments. Hence, increases in volumes refer to the quantities that are part of the hedging relationship, and decreases in volumes are not part of the hedging relationship.

The amount accumulated in the hedging reserve and the cost of hedging reserve is reclassified to profit or loss in the same period or periods during which the hedged expected future cash flows affect profit or loss.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(m) Financial instruments *(Cont'd)*

(vii) Cash flow hedge *(Cont'd)*

When the hedged forecast transaction subsequently results in the recognition of a non-financial item, the amount accumulated in the hedging reserve and the cost of hedging reserve is included directly in the initial cost of the non-financial item when it is recognised.

If the amount that has been accumulated in the cash flow hedge reserve is a loss and the Group expects that all or a portion of that loss will not be recovered in one or more future periods, the Group immediately reclassifies the amount that is not expected to be recovered in profit or loss.

When the Group discontinues hedge accounting for a cash flow hedge, the Group accounts for the amount that has been accumulated in the cash flow hedge reserve as follows:

– if the hedged future cash flows are still expected to occur, that amount shall remain in the cash flow hedge reserve until the future cash flows occur;

– if the hedged future cash flows are no longer expected to occur, that amount shall be immediately reclassified from the cash flow hedge reserve to profit or loss. A hedged future cash flow that is no longer highly probable to occur may still be expected to occur.

When the future cash flows occur, the amounts accumulated in the hedging reserve of the effective portion are reclassified to profit or loss or included directly in the initial cost of the non-financial item. If the hedged future cash flows are no longer expected to occur, then the amounts that have been accumulated in the hedging reserve and the cost of hedging reserve are immediately reclassified to profit or loss.

(n) Dividend distribution

Dividend distribution to the shareholders of the Group is recognised as a liability in the period when the dividend is approved in the shareholders' meeting.

(o) Inventories

Inventories include fuel for power generation, materials for repairs and maintenance and spare parts, and are stated at lower of cost and net realisable values.

Inventories are initially recorded at cost and are charged to fuel costs or repairs and maintenance, respectively when used, or capitalized to property, plant and equipment when installed, as appropriate, using weighted average cost basis. Cost of inventories includes costs of purchase and transportation costs.

When the forecast transaction that is hedged results in the recognition of the inventory, the gains and losses previously deferred in equity are transferred from equity and included in the initial measurement of the cost of the inventory.

Provision for inventory obsolescence is determined by the excess of cost over net realisable value. Net realisable values are determined based on the estimated selling price less estimated conversion costs during power generation, selling expenses and related taxes in the ordinary course of business.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(p) Related parties

A party is considered to be related to the Group if:

(a) the party is a person or a close member of that person's family and that person

(i) has control or joint control over the Group;

(ii) has significant influence over the Group; or

(iii) is a member of the key management personnel of the Group or of a parent of the Group;

or

(b) the party is an entity where any of the following conditions applies:

(i) the entity and the Group are members of the same group;

(ii) one entity is an associate or joint venture of the other entity (or of a parent, subsidiary or fellow subsidiary of the other entity);

(iii) the entity and the Group are joint ventures of the same third party;

(iv) one entity is a joint venture of a third entity and the other entity is an associate of the third entity;

(v) the entity is a post-employment benefit plan for the benefit of employees of either the Group or an entity related to the Group;

(vi) the entity is controlled or jointly controlled by a person identified in (a);

(vii) a person identified in (a)(i) has significant influence over the entity or is a member of the key management personnel of the entity (or of a parent of the entity); and

(viii) the entity, or any member of a group of which it is a part, provides key management personnel services to the Group or to the parent of the Group.

(q) Cash and cash equivalents

Cash and cash equivalents listed in the statement of cash flows represents cash in hand, call deposits held with banks and other financial institutions, and other short-term (3 months or less), highly-liquid investments that are readily convertible to known amounts of cash and are subject to an insignificant risk of changes in value. Bank overdrafts that are repayable on demand and form an integral part of the cash management are also included as a component of cash and cash equivalents for the purpose of the consolidated statement of cash flows.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(r) Borrowings

Borrowings are recognised initially at fair value less transaction costs and subsequently measured at amortised cost using the effective interest method. Borrowings are classified as current liabilities unless the Group has an unconditional right to defer settlement of the liability for at least 12 months after the end of the reporting period.

(s) Borrowing costs

General and specific borrowing costs directly attributable to the acquisition, construction or production of qualifying assets, which are assets that necessarily take a substantial period of time to get ready for their intended use or sale, are added to the cost of those assets. The capitalisation of borrowing costs as part of the cost of a qualifying asset commences when expenditure for the asset is being incurred, borrowing costs are being incurred and activities that are necessary to prepare the asset for its intended use or sale are in progress. Capitalisation of borrowing costs is suspended or ceases when substantially all the activities necessary to prepare the qualifying asset for its intended use or sale are interrupted or complete.

The amount of specific borrowing costs capitalised is net of the investment income on any temporary investment of the funds pending expenditure on the asset.

All other borrowing costs are recognised in profit or loss in the period in which they are incurred.

(t) Share capital

Ordinary shares are classified as equity. Incremental costs directly attributable to the issue of new shares are shown in equity as a deduction, net of tax, from the proceeds.

(u) Other equity instruments

Perpetual corporate bonds and other equity instruments are classified as equity if they are non-redeemable, or redeemable only at the Company's option, and any interests or dividends are discretionary. Interests or dividends on such instruments classified as equity are recognised as distributions within equity. When these equity instruments are redeemed according to the contractual terms, the redemption price is charged to equity.

(v) Payables

Payables primarily include accounts payable and other liabilities, and are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method.

(w) Taxation

(i) Value-added tax ("VAT")

The domestic sales of power, heat and goods of the Group are subject to VAT. VAT payable is determined by applying 13%, 9% and 6% on the taxable revenue after offsetting deductible input VAT of the period.

(ii) Goods and service tax ("GST")

The power sales of the subsidiaries in Singapore are subject to goods and service tax of the country where they operate. GST payable is determined by applying 7% on the taxable revenue after offsetting deductible GST of the period.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(w) Taxation *(Cont'd)*

(ii) Goods and service tax ("GST") *(Cont'd)*

The subsidiaries in Pakistan are subject to goods and service tax of the country where they operate. The applicable tax rates in respect of capacity payment, operation and maintenance services and sales of power are 0%, 16% and 17% respectively on the taxable revenue.

(iii) Current and deferred income tax

The income tax expense for the period comprises current and deferred income tax. Income tax expense is recognised in profit or loss, except to the extent that it relates to items recognised in other comprehensive income or directly in equity. In this case, the tax is also recognised in other comprehensive income or directly in equity, respectively.

Deferred income tax assets and liabilities are recognised based on the differences between tax bases of assets and liabilities and respective book values (temporary differences). For deductible tax losses or tax credit that can be brought forward in accordance with tax law requirements for deduction of taxable income in subsequent years, it is considered as temporary differences and related deferred income tax assets are recognised. No deferred income tax liability is recognised for temporary differences arising from initial recognition of goodwill. For those temporary differences arising from initial recognition of an asset or liability in a non-business combination transaction that affects neither accounting profit nor taxable profit (or deductible loss) at the time of the transaction, no deferred income tax asset and liability is recognised. For the temporary differences relating to investments in subsidiaries to the extent that, in the case of taxable differences, the Group controls the timing of the reversal and it is probable that the differences will not reverse in the foreseeable future, or in the case of deductible differences, unless it is probable that they will reverse in the future, no deferred income tax asset and liability is recognised.

The Group recognises deferred income tax assets to the extent that it is probable that taxable profit will be available to offset the deductible temporary difference, deductible tax loss and tax credit.

At the end of the reporting period, deferred income tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realised or liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and is reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow the related tax benefit to be utilised. Any such reduction is reversed to the extent that it becomes probable that sufficient taxable profits will be available.

Deferred income tax assets and deferred income tax liabilities are offset when all the conditions below are met:

(1) The Group has the legally enforceable right to offset current income tax assets and current income tax liabilities;

(2) Deferred income tax assets and deferred income tax liabilities are related to the income tax levied by the same tax authority of the Group.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(x) Employee benefits

Employee benefits include all expenditures relating to the employees for their services. The Group recognises employee benefits as liabilities during the accounting period when employees render services and allocate to related cost of assets and expenses based on different beneficiaries.

In connection with pension obligations, the Group operates various defined contribution plans in accordance with the local conditions and practices in the countries and provinces in which it operate. A defined contribution plan is a pension plan under which the Group pays fixed contributions into a separate publicly administered pension insurance plan on mandatory and voluntary bases. The Group has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee service in the current and prior periods. The contributions are recognised as employee benefits when incurred. Prepaid contributions are recognised as assets to the extent that a cash refund or a reduction in the future payment is available.

(y) Government grants

Government grants are recognised when the Group fulfils the conditions attached to them and they are probable to be received. When government grants are received in the form of monetary assets, they are measured at the amount received or receivable. When the grant is in the form of non-monetary assets, it is measured at fair value. When fair value cannot be measured reliably, a nominal amount is assigned.

Asset-related government grant is recognised as deferred income and is amortised evenly in profit or loss over the useful lives of related assets.

Income-related government grant that is used to compensate subsequent related expenses or losses of the Group is recognised as deferred income and recorded in profit or loss when related expenses or losses are incurred. When the grant is used to compensate expenses or losses that were already incurred, they are directly recognised in the current period profit or loss.

(z) Revenue and other income

Income is increases in economic benefits during the accounting period in the form of inflows or enhancements of assets or decreases of liabilities that result in an increase in equity, other than those relating to contributions from equity participants.

Revenue is recognised when (or as) the Group satisfies a performance obligation in the contract by transferring the control over a promised good or service to a customer.

When two or more performance obligations are identified, the Group allocates the transaction price to each performance obligation identified in the contract on a relative stand-alone selling price basis at contract inception and recognises as revenue the amount of the transaction price that is allocated to that performance obligation.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(z) Revenue and other income *(Cont'd)*

Transaction price is the amount of consideration to which the Group expects to be entitled in exchange for transferring promised goods or services to a customer, excluding amounts collected on behalf of third parties. Revenue is only recognised to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognised will not occur. The Group recognises a refund liability if the entity receives consideration from a customer and expects to refund some or all of that consideration to the customer. Where the contract contains a significant financing component, the Group recognises revenue at an amount that reflects the price that a customer would have paid for the promised goods or services if the customer had paid cash for those goods or services when (or as) they transfer to the customer. The difference between the promised amount of consideration and its present value is amortised using the effective interest rate. The Group will not adjust the promised amount of consideration for the effects of a significant financing component if the Group expects, at contract inception, that the period between when the Group transfers a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

A performance obligation is satisfied over time if one of the following criteria is met:

– When the customer simultaneously receives and consumes the benefits provided by the Group's performance, as the Group performs;

– When the Group's performance creates or enhances an asset that the customer controls as the asset is created or enhanced;

– When the Group's performance does not create an asset with an alternative use to the entity and the Group has an enforceable right to payment for performance completed to date.

For performance obligations satisfied over time, revenue is recognised on the basis of direct measurements of the value to the customer of the goods or services transferred to date relative to the remaining goods or services promised under the contract. When the outcome of the contract cannot be reasonably measured, revenue is recognised only to the extent of contract costs incurred that are expected to be recovered.

For performance obligations satisfied at a point in time, revenue is recognised when the customer obtains control of the promised good or service in the contract. The Group considers indicators of the transfer of control, which include, but are not limited to, the following:

– The Group has a present right to payment for the asset;

– The Group has transferred physical possession of the asset;

– The customer has legal title to the asset or the significant risks and rewards of ownership of the asset; or

– The customer has accepted the asset.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(z) Revenue and other income *(Cont'd)*

A contract asset is the Group's right to consideration in exchange for goods or services that the Group has transferred to a customer when that right is conditional on something other than the passage of time and an impairment of a contract asset is measured using the ECL model (Note 2(m)(vi)). The Group presents any unconditional rights to consideration separately as a receivable. The Group's obligation to transfer goods or services to a customer for which the Group has received consideration (or the amount is due) from the customer is present as a contract liability.

Further details of revenue and income recognition policies are as follows:

(i) Sale of power

Revenue is recognised upon transmission of electricity to the power grid when the control of the electricity is transferred at the same time.

(ii) Sale of heat

Revenue is recognised upon transmission of heat to the customers when the control of the heat is transferred at the same time.

(iii) Service revenue

Service revenue refers to amounts received from port service, transportation service, maintenance service and heating pipeline service that is recognised over time during the provision of service, using an input method to measure progress towards complete satisfaction of the service, because the customer simultaneously receives and consumes the benefits provided by the Group. Revenue is recognised on a straight-line basis because the entity's inputs are expended evenly throughout the performance period.

(iv) Coal and raw material sales revenue

Revenue is recognised when the control of the fuel and materials is transferred to the customers.

(v) Rental income from operating leases

Rental income receivable under operating leases is recognised in profit or loss in equal instalments over the periods covered by the lease term, except where an alternative basis is more representative of the pattern of benefits to be derived from the use of the leased asset. Lease incentives granted are recognised in profit or loss as an integral part of the aggregate net lease payments receivable. Contingent rentals are recognised as income in the accounting period in which they are earned.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(z) Revenue and other income *(Cont'd)*

(vi) Dividend income

Dividend income is recognised when the shareholders' right to receive payment has been established, it is probable that the economic benefits associated with the dividend will flow to the Group and the amount of the dividend can be measured reliably.

(vii) Interest income

Interest income from deposits is recognised on a time proportion basis using the effective interest method. Interest income from finance leases is recognised on a basis that reflects a constant periodic rate of return on the net investment in the finance lease.

(aa) Contract cost

Contract costs are either the incremental costs of obtaining a contract with a customer or the costs to fulfil a contract with a customer.

Incremental costs of obtaining a contract are those costs that the Group incurs to obtain a contract with a customer that it would not have incurred if the contract had not been obtained e.g. an incremental sales commission. Incremental costs of obtaining a contract are capitalised when incurred if the costs relate to revenue which will be recognised in a future reporting period and the costs are expected to be recovered. Other costs of obtaining a contract are expensed when incurred.

If the costs incurred in fulfilling a contract with a customer are not within the scope of another Standard such as IAS 2 *Inventories*, the Group recognises an asset from the costs incurred to fulfil a contract only if those costs meet all of the following criteria:

– the costs relate directly to an existing contract or to a specifically identifiable anticipated contract, including direct labour, direct materials, allocations of costs, costs that are explicitly chargeable to the customer and other costs that are incurred only because the Group entered into the contract;

– the costs generate or enhance resources that will be used to provide goods or services in the future; and

– the costs are expected to be recovered.

Amortisation of capitalised contract costs is charged to profit or loss when the revenue to which the asset relates is recognised. The accounting policy for revenue recognition is set out in Note 2(z). Contract costs are recognised as an expense when incurred if the amortisation period of the asset that the Group otherwise would have recognised is one year or less.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(aa) Contract cost *(Cont'd)*

Impairment losses are recognised to the extent that the carrying amount of the contract cost asset exceeds the net of:

(i) remaining amount of consideration that the Group expects to receive in exchange for the goods or services to which the asset relates, less

(ii) any costs that relate directly to providing those goods or services that have not yet been recognised as expenses.

(ab) Leases

The Group assesses at contract inception whether a contract is, or contains, a lease. A contract is, or contains, a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

Group as a lessee

The Group applies a single recognition and measurement approach for all leases, except for short-term leases and leases of low-value assets. The Group recognises lease liabilities to make lease payments and right-of-use assets representing the right to use the underlying assets.

At inception or on reassessment of a contract that contains a lease component and non-lease component(s), the Group adopts the practical expedient not to separate non-lease component(s) and to account for the lease component and the associated non-lease component(s) (e.g., property management services for leases of properties) as a single lease component.

(i) Right-of-use assets

Right-of-use assets are recognised at the commencement date of the lease (that is the date the underlying asset is available for use). Right-of-use assets are measured at cost, less any accumulated depreciation and any impairment losses, and adjusted for any remeasurement of lease liabilities. The cost of right-of-use assets includes the amount of lease liabilities recognised, initial direct costs incurred, and lease payments made at or before the commencement date less any lease incentives received. Right-of-use assets are depreciated on a straight-line basis over the shorter of the lease terms and the estimated useful lives of the assets as follows:

Buildings	2.5 – 10 years
Electric utility plant in service	8 – 25 years
Transportation facilities	30 years
Land use rights	10 – 50 years
Others	5 – 50 years

If ownership of the leased asset transfers to the Group by the end of the lease term or the cost reflects the exercise of a purchase option, depreciation is calculated using the estimated useful life of the asset.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(ab)Leases *(Cont'd)*

Group as a lessee *(Cont'd)*

(ii) Lease liabilities

Lease liabilities are recognised at the commencement date of the lease at the present value of lease payments to be made over the lease term. The lease payments include fixed payments (including in-substance fixed payments) less any lease incentives receivable, variable lease payments that depend on an index or a rate, and amounts expected to be paid under residual value guarantees. The lease payments also include the exercise price of a purchase option reasonably certain to be exercised by the Group and payments of penalties for termination of a lease, if the lease term reflects the Group exercising the option to terminate the lease. The variable lease payments that do not depend on an index or a rate are recognised as an expense in the period in which the event or condition that triggers the payment occurs.

In calculating the present value of lease payments, the Group uses its incremental borrowing rate at the lease commencement date because the interest rate implicit in the lease is not readily determinable. After the commencement date, the amount of lease liabilities is increased to reflect the accretion of interest and reduced for the lease payments made. In addition, the carrying amount of lease liabilities is remeasured if there is a modification, a change in the lease term, a change in lease payments (e.g., a change to future lease payments resulting from a change in an index or rate) or a change in assessment of an option to purchase the underlying asset.

(iii) Short-term leases and leases of low-value assets

The Group has elected not to recognise right-of-use assets and lease liabilities for its short-term leases (elected by class of underlying asset) of certain offices and apartments for employees (that is those leases that have a lease term of 12 months or less from the commencement date and do not contain a purchase option). It also applies the recognition exemption for leases of low-value assets (elected on a lease by lease basis) to leases of office equipment that is considered to be of low value (i.e., below RMB30,000). Instead, the Group recognises the lease payments associated with those leases as an expense on a straight-line basis over the lease term.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(ab)Leases *(Cont'd)*

Group as a lessor

When the Group acts as a lessor, it classifies at lease inception (or when there is a lease modification) each of its leases as either an operating lease or a finance lease.

Leases in which the Group does not transfer substantially all the risks and rewards incidental to ownership of an asset are classified as operating leases. When a contract contains lease and non-lease components, the Group allocates the consideration in the contract to each component on a relative stand-alone selling price basis. Rental income is accounted for on a straight-line basis over the lease terms and is included in revenue in the statement of comprehensive income due to its operating nature. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognised over the lease term on the same basis as rental income. Contingent rents are recognised as revenue in the period in which they are earned.

Leases that transfer substantially all the risks and rewards incidental to ownership of an underlying asset to the lessee are accounted for as finance leases. At the commencement date, the cost of the leased asset is capitalised at the present value of the lease payments and related payments (including the initial direct costs), and presented as a receivable at an amount equal to the net investment in the lease. The finance income of such leases is recognised in the statement of comprehensive income so as to provide a constant periodic rate of charge over the lease terms.

(ac) Contingencies

Contingent liabilities are not recognised in the financial statements. They are disclosed unless the possibility of an outflow of resources embodying economic benefits is remote. Contingent assets are not recognised in the financial statements but disclosed when an inflow of economic benefit is probable.

(ad)Fair value management

The Group measures its equity investments at fair value at the end of each reporting period. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value measurement is based on the presumption that the transaction to sell the asset or transfer the liability takes place either in the principal market for the asset or liability, or in the absence of a principal market, in the most advantageous market for the asset or liability. The principal or the most advantageous market must be accessible by the Group. The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest.

A fair value measurement of a non-financial asset takes into account a market participant's ability to generate economic benefits by using the asset in its highest and best use or by selling it to another market participant that would use the asset in its highest and best use.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(ad)Fair value management *(Cont'd)*

The Group uses valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value, maximising the use of relevant observable inputs and minimising the use of unobservable inputs.

All assets and liabilities for which fair value is measured or disclosed in the financial statements are categorised within the fair value hierarchy, described as follows, based on the lowest level input that is significant to the fair value measurement as a whole:

Level 1 – based on quoted prices (unadjusted) in active markets for identical assets or liabilities

Level 2 – based on valuation techniques for which the lowest level input that is significant to the fair value measurement is observable, either directly or indirectly

Level 3 – based on valuation techniques for which the lowest level input that is significant to the fair value measurement is unobservable

For assets and liabilities that are recognised in the financial statements on a recurring basis, the Group determines whether transfers have occurred between levels in the hierarchy by reassessing categorisation (based on the lowest level input that is significant to the fair value measurement as a whole) at the end of each reporting period.

(ae)Research and development costs

All research costs are charged to the statement of profit or loss as incurred.

Expenditure incurred on projects to develop new products is capitalised and deferred only when the Group can demonstrate the technical feasibility of completing the intangible asset so that it will be available for use or sale, its intention to complete and its ability to use or sell the asset, how the asset will generate future economic benefits, the availability of resources to complete the project and the ability to measure reliably the expenditure during the development. Product development expenditure which does not meet these criteria is expensed when incurred.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(af) Issued but not yet effective International Financial Reporting Standards

The new and amended standards and interpretations that are issued, but not yet effective, up to the date of issuance of the Group's financial statements are disclosed below. The Group intends to adopt these new and amended standards and interpretations, if applicable, when they become effective.

Amendments to IAS 1	*Classification of Liabilities as Current or Non-current*
Amendments to IFRS 3	*Reference to the Conceptual Framework*
Amendments to IAS 16	*Property, Plant and Equipment: Proceeds before Intended Use*
Amendments to IAS 37	*Onerous Contracts – Cost of Fulfilling a Contract*
Amendments to IFRS 10 and IAS 28	*Sale or Contribution of Assets between an Investor and its Associate or Joint Venture*
Amendments to IAS 8	*Definition of Accounting Estimates*
Amendments to IAS 1 and IFRS Practice Statement 2	*Disclosure of Accounting Policies*
Amendments to IAS 12	*Deferred Tax related to Assets and Liabilities arising from a Single Transaction*
Annual Improvements to IFRSs 2018-2020	Amendments to IFRS 1, IFRS 9, Illustrative Examples accompanying IFRS 16, and IAS 41

(i) Amendments to IAS 1 *Classification of Liabilities as Current or Non-current*

In January 2020, the IASB issued amendments to paragraphs 69 to 76 of IAS 1 to specify the requirements for classifying liabilities as current or non-current. The amendments clarify:

– What is meant by a right to defer settlement

– That a right to defer must exist at the end of the reporting period

– That classification is unaffected by the likelihood that an entity will exercise its deferral right

– That only if an embedded derivative in a convertible liability is itself an equity instrument would the terms of a liability not impact its classification

The amendments are effective for annual reporting periods beginning on or after 1 January 2023 and must be applied retrospectively. The Group is currently assessing the impact that the amendments will have on current practice and whether existing loan agreements may require renegotiation.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(af) Issued but not yet effective International Financial Reporting Standards *(Cont'd)*

(ii) Amendments to IFRS 3 *Reference to the Conceptual Framework*

Amendments to IFRS 3 are intended to replace a reference to the previous *Framework for the Preparation and Presentation of Financial Statements* with a reference to the *Conceptual Framework for Financial Reporting* issued in March 2018 without significantly changing its requirements. The amendments also add to IFRS 3 an exception to its recognition principle for an entity to refer to the Conceptual Framework to determine what constitutes an asset or a liability. The exception specifies that, for liabilities and contingent liabilities that would be within the scope of IAS 37 or IFRIC 21 if they were incurred separately rather than assumed in a business combination, an entity applying IFRS 3 should refer to IAS 37 or IFRIC 21 respectively instead of the Conceptual Framework. Furthermore, the amendments clarify that contingent assets do not qualify for recognition at the acquisition date. The amendments are effective for annual reporting periods beginning on or after 1 January 2022 and apply prospectively. The Group expects to adopt the amendments prospectively from 1 January 2022. Since the amendments apply prospectively to business combinations for which the acquisition date is on or after the date of first application, the Group will not be affected by these amendments on the date of transition.

(iii) Amendments to IAS 16 *Property, Plant and Equipment: Proceeds before Intended Use*

In May 2020, the IASB issued *Property, Plant and Equipment: Proceeds before Intended Use,* which prohibit entities deducting from the cost of an item of property, plant and equipment any proceeds from selling items produced while bringing that asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Instead, an entity recognises the proceeds from selling such items, and the costs of producing those items, in profit or loss.

The amendments are effective for annual reporting periods beginning on or after 1 January 2022 and must be applied retrospectively to items of property, plant and equipment made available for use on or after the beginning of the earliest period presented when the entity first applies the amendments. The Group is currently assessing the impact that the amendments will have on current practice.

(iv) Amendments to IAS 37 *Onerous Contracts – Cost of Fulfilling a Contract*

In May 2020, the IASB issued amendments to IAS 37 to specify which costs an entity needs to include when assessing whether a contract is onerous or loss-making.

The amendments apply a "directly related cost approach". The costs that relate directly to a contract to provide goods or services include both incremental costs and an allocation of costs directly related to contract activities. General and administrative costs do not relate directly to a contract and are excluded unless they are explicitly chargeable to the counterparty under the contract.

The amendments are effective for annual reporting periods beginning on or after 1 January 2022. The Group will apply these amendments to contracts for which it has not yet fulfilled all its obligations at the beginning of the annual reporting period in which it first applies the amendments. The Group is currently assessing the impact that the amendments will have on current practice.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(af) Issued but not yet effective International Financial Reporting Standards *(Cont'd)*

(v) Amendments to IFRS 10 and IAS 28 *Sale or Contribution of Assets between an Investor and its Associate or Joint Venture*

The amendments address an inconsistency between the requirements in IFRS 10 and in IAS 28 in dealing with the sale or contribution of assets between an investor and its associate or joint venture. The amendments require a full recognition of a gain or loss resulting from a downstream transaction when the sale or contribution of assets between an investor and its associate or joint venture constitutes a business. For a transaction involving assets that do not constitute a business, a gain or loss resulting from the transaction is recognised in the investor's profit or loss only to the extent of the unrelated investor's interest in that associate or joint venture. The mandatory effective date for these amendments is not yet determined but early adoption is permitted. The Group is currently assessing the impact that the amendments will have on current practice.

(vi) Amendments to IAS 8 *Definition of Accounting Estimates*

In February 2021, the IASB issued amendments to IAS 8, in which it introduces a definition of 'accounting estimates'. The amendments clarify the distinction between changes in accounting estimates and changes in accounting policies and the correction of errors. Also, they clarify how entities use measurement techniques and inputs to develop accounting estimates.

The amendments are effective for annual reporting periods beginning on or after 1 January 2023 and apply to changes in accounting policies and changes in accounting estimates that occur on or after the start of that period. Earlier application is permitted as long as this fact is disclosed.

The Group is currently assessing the impact that the amendments will have on current practice.

(vii) Amendments to IAS 1 and IFRS Practice Statement 2 *Disclosure of Accounting Policies*

In February 2021, the IASB issued amendments to IAS 1 and IFRS Practice Statement 2 *Making Materiality Judgements,* in which it provides guidance and examples to help entities apply materiality judgements to accounting policy disclosures. The amendments aim to help entities provide accounting policy disclosures that are more useful by replacing the requirement for entities to disclose their 'significant' accounting policies with a requirement to disclose their 'material' accounting policies and adding guidance on how entities apply the concept of materiality in making decisions about accounting policy disclosures.

The amendments to IAS 1 are applicable for annual periods beginning on or after 1 January 2023 with earlier application permitted. Since the amendments to the Practice Statement 2 provide non-mandatory guidance on the application of the definition of material to accounting policy information, an effective date for these amendments is not necessary.

The Group is currently assessing the impact that the amendments will have on current practice.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(af) Issued but not yet effective International Financial Reporting Standards *(Cont'd)*

(viii) Amendments to IAS 12 *Deferred Tax related to Assets and Liabilities arising from a Single Transaction*

Amendments to IAS 12 narrow the scope of the initial recognition exception so that it no longer applies to transactions that give rise to equal taxable and deductible temporary differences, such as leases and decommissioning obligations. Therefore, entities are required to recognise a deferred tax asset and a deferred tax liability for temporary differences arising from these transactions. The amendments are effective for annual reporting periods beginning on or after 1 January 2023 and shall be applied to transactions related to leases and decommissioning obligations at the beginning of the earliest comparative period presented, with any cumulative effect recognised as an adjustment to the opening balance of retained profits or other component of equity as appropriate at that date. In addition, the amendments shall be applied prospectively to transactions other than leases and decommissioning obligations. Earlier application is permitted. The Group is currently assessing the impact that the amendments will have on current practice.

(ix) *Annual Improvements to IFRSs 2018-2020* Amendments to IFRS 1, IFRS 9 and Illustrative Examples accompanying IFRS 16, and IAS 41

Annual Improvements to IFRSs 2018-2020 sets out amendments to IFRS 1, IFRS 9, Illustrative Examples accompanying IFRS 16, and IAS 41. Details of the amendments that are expected to be applicable to the Group are as follows:

IFRS 9 *Financial Instruments:* clarifies the fees that an entity includes when assessing whether the terms of a new or modified financial liability are substantially different from the terms of the original financial liability. These fees include only those paid or received between the borrower and the lender, including fees paid or received by either the borrower or lender on the other's behalf. An entity applies the amendment to financial liabilities that are modified or exchanged on or after the beginning of the annual reporting period in which the entity first applies the amendment. The amendment is effective for annual periods beginning on or after 1 January 2022. Earlier application is permitted. The Group is currently assessing the impact that the amendments will have on current practice.

IFRS 16 *Leases* removes the illustration of payments from the lessor relating to leasehold improvements in Illustrative Example 13 accompanying IFRS 16. This removes potential confusion regarding the treatment of lease incentives when applying IFRS 16. The Group is currently assessing the impact that the amendments will have on current practice.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT

(a) Financial risk management

Risk management, including the management of financial risks, is carried out under the instructions of the Strategic Committee of the Board of Directors and the Risk Management Team. The Group works out general principles for overall management as well as management policies covering specific areas. In considering the importance of risks, the Group identifies and evaluates risks at head office and individual power plant level, and requires analysis and proper communication of the information collected periodically.

SinoSing Power and its subsidiaries and Huaneng Shandong Ruyi (Pakistan) Energy (Private) Co., Ltd. ("Ruyi Pakistan Energy") and Shandong Huatai Electric Power Operation & Maintenance (Private) Co., Ltd. ("Huatai Power"), the subsidiaries of Hong Kong Energy, are subject to financial risks that are different from the entities operating within the PRC. They have a series of controls in place to maintain the cost of risks occurring and the cost of managing the risks at an acceptable level. Management continually monitors the risk management process to ensure that an appropriate balance between risk and control is achieved. SinoSing Power and its subsidiaries, Ruyi Pakistan Energy and Huatai Power have their written policies and financial authorisation limits in place which are reviewed periodically. These financial authorisation limits seek to mitigate and eliminate operational risks by setting approval thresholds required for entering into contractual obligations and investments.

(i) Market risk

(1) Foreign exchange risk

Foreign exchange risk of the entities operating within the PRC primarily arises from loans denominated in foreign currencies of the Group. SinoSing Power and its subsidiaries are exposed to foreign exchange risk on bank balances, accounts receivable, other receivables and assets, accounts payable, long-term bonds and other liabilities that are denominated primarily in US$, a currency other than the Singapore dollar ("S$"), their functional currency. Ruyi Pakistan Energy is exposed to foreign exchange risk on bank balances, financial lease receivables, accounts payable and other liabilities and long-term loans that are denominated primarily in US$, a currency other than Pakistan rupee ("PKR"), their functional currency. The Group manages exchange risk through closely monitoring the interest and exchange market.

As at 31 December 2021, if RMB had weakened/strengthened by 5% (2020: 5%) against US$ and 3% (2020: 3%) against EUR ("€") with all other variables constant, the Group would further recognise an exchange loss/gain amounting to RMB21 million (2020: RMB51 million) and RMB1 million (2020: RMB3 million), respectively. The ranges of such sensitivity disclosed above were based on the observation on the historical trend of related exchange rates during the previous year under analysis.

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(i) Market risk *(Cont'd)*

(1) Foreign exchange risk (Cont'd)

As at 31 December 2021, if S$ had weakened/strengthened by 10% (2020:10%) against US$ with all other variables constant, SinoSing Power and its subsidiaries would further recognise exchange loss/gain amounting to RMB364 million (2020: RMB418 million). The range of such sensitivity disclosed above was based on the management's experience and forecast.

SinoSing Power and its subsidiaries also are exposed to foreign exchange risk on fuel purchases that are denominated primarily in US$. They substantially hedge their estimated foreign currency exposure in respect of forecast fuel purchases over the next three months using primarily foreign currency contracts.

As at 31 December 2021, if PKR had weakened/strengthened by 5% (2020: 5%) against US$ with all other variables constant, Ruyi Pakistan Energy would further recognise an exchange gain/loss amounting to RMB55 million (2020: RMB78 million). The range of such sensitivity disclosed above was based on the management's experience and forecast.

Ruyi Pakistan Energy is exposed to foreign exchange risk on payments of long-term loans that are denominated primarily in US$. Ruyi Pakistan Energy entered into an agreement on a tariff adjustment mechanism with Central Power Purchasing Agency (Guarantee) Limited ("CPPA-G") and the tariff adjustment mechanism was approved by the National Electric Power Regulatory Authority. The mechanism mitigates foreign exchange risk by decreasing or increasing electricity tariff when PKR strengthens or weakens against US$.

(2) Price risk

The other equity instrument investments of the Group designated as at FVTOCI are exposed to equity security price risk.

Detailed information relating to the other equity instrument investments is disclosed in Note 10. The Group closely monitors the pricing trends in the open market in determining its long-term strategic stakeholding decisions.

The Group is exposed to fuel price risk on fuel purchases. In particular, SinoSing Power and its subsidiaries use fuel oil swaps to hedge against such a risk and designate them as cash flow hedges. Please refer to Note 13 for details.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(i) Market risk *(Cont'd)*

(3) Cash flow interest rate risk

The interest rate risk of the Group primarily arises from loans. Loans borrowed at variable rates expose the Group to cash flow interest rate risk. The exposures of these risks are disclosed in Notes 24 and 30 to the financial statements. The Group has entered into interest rate swap agreements with banks to hedge against a portion of cash flow interest rate risk.

As at 31 December 2021, if interest rates on RMB-denominated borrowings had been 50 basis points higher/lower with all other variables held constant, interest expense for the year would have been RMB1,002 million (2020: RMB812 million) higher/lower. If interest rates on US$-denominated borrowings had been 50 basis points higher/lower with all other variables held constant, interest expense for the year would have been RMB43 million (2020: RMB48 million) higher/lower. If interest rates on S$-denominated borrowings had been 100 basis points higher/lower with all other variables held constant, interest expense for the year would have been RMB62 million (2020: RMB70 million) higher/lower. The ranges of such sensitivity disclosed above were based on the observation on the historical trend of related interest rates during the previous year under analysis.

TP-STM Water Resources Pte. Ltd. ("TPSTMWR") also entered into a number of floating-to-fixed interest rate swap agreements to hedge against cash flow interest rate risk of loans.

According to the interest rate swap agreements, TPSTMWR agrees with the counterparty to settle the difference between fixed contract rates and floating-rate interest amounts calculated by reference to the agreed notional amount quarterly until 2044. Please refer to Note 13 for details.

(ii) Credit risk

Credit risk arises from bank deposits, accounts receivable, contract assets, other receivables and assets and other non-current assets. The maximum exposures of contract assets, other non-current assets, other receivables and assets, accounts receivable and bank deposits are disclosed in Notes 5(c), 15, 17, 18 and 35 to the financial statements, respectively.

Bank deposits are placed with reputable banks and financial institutions. In addition, a significant portion is deposited with a non-bank financial institution which is a related party of the Group. The Group has a director on the Board of this non-bank financial institution and exercises influence. Corresponding maximum exposures of these bank deposits are disclosed in Note 36 (a)(i) to the financial statements.

The majority of the power plants of the Group operating within the PRC sell electricity generated to their sole customers, the power grid companies of their respective provinces or regions where the power plants operate. These power plants communicate with their individual grid companies periodically and believe that adequate provision for loss allowance on accounts receivable has been made in the financial statements.

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(ii) Credit risk *(Cont'd)*

Pursuant to Cai Jian [2020] No. 4 Opinions on the Promotion of Healthy Development over Non-water Renewable Energy Power Generation jointly issued by the Ministry of Finance, the National Development and Reform Commission and the National Energy Administration in January 2020, the application process of renewable energy tariff premium has been further simplified to file the project tariff supplementary information on the National Renewable Energy Information Management Platform. The tariff premium receivables are settled in accordance with prevailing government policies and prevalent payment trends of the Ministry of Finance. There is no due date for settlement. The directors are of the opinion that the application process will be completed in due course and these trade receivables from tariff premium are fully recoverable considering there were no bad debt experiences with the grid companies in the past and such tariff premium is funded by the PRC government. On 20 January 2020, the Ministry of Finance, the National Development and Reform Commission and the National Energy Administration jointly issued Cai Jian [2020] No. 5 Notice on the Measures for Administration of Funds for Tariff Premium of Renewable Energy and abolished the Notice on the Interim Measures for Administration of Subsidy Funds for Tariff Premium of Renewable Energy issued in 2012. The new measures clarified that the total amount of funds for tariff premium will be determined by the Ministry of Finance in accordance with the principle of determining expenditure by revenue, and the capacity of newly installed renewable energy projects within the premium scope will be determined by the National Development and Reform Commission and the Energy Administration. At the same time, the stock projects included in the annual construction plan could be enrolled in the list of subsidies after approved by the power grid company.

Singapore subsidiaries derive revenue mainly from the sale of electricity to the National Electricity Market of Singapore operated by Energy Market Company Pte. Ltd., which does not have high credit risk. Singapore subsidiaries also derive revenue mainly from retailing electricity to consumers with monthly consumption of more than 2,000kWh. These customers engage in a wide spectrum of manufacturing and commercial activities in a variety of industries. Singapore subsidiaries also entered into a build-operate-transfer agreement with a Singapore government related entity for certain water related projects, the projects were still in construction phase and thus contract assets were recognised accordingly, and the Singapore government related entity does not have high credit risk.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(ii) Credit risk *(Cont'd)*

Ruyi Pakistan Energy derives revenue from the sale of electricity to CPPA-G, which is measured on the basis of lifetime ECLs. The loss allowances recognised during the year were RMB0.33 million.

Finance lease receivables are mainly from a domestic related party, business enterprises in Singapore and CPPA-G in Pakistan. As the related party and Singapore local enterprises have a good track of records and no historical losses have been incurred, the Group concluded that these receivables have low credit risk and remote possibility of default. The finance lease receivables from CPPA-G are secured against the sovereign guarantee issued by the Government of Pakistan pursuant to the designated agreement. The ECLs of the finance lease receivables are measured on the basis of lifetime ECLs, and a 0.03% of risk of default against the Government of Pakistan is considered during the assessment. The ECLs relating to the finance lease receivables recognised during the year were RMB0.15 million.

The Group measures loss allowances for accounts receivable and contract assets at an amount equal to lifetime ECLs, which is calculated using a provision matrix. As at 31 December 2021, for accounts receivable amounting to RMB3,088 million with specific credit risk, the Group measures their credit risk individually and recognised loss allowances amounting to RMB133 million. For other accounts receivable and notes receivable, the Group measures loss allowances based on the past due status and further distinguish them by the Group's different customer bases and business types into five categories. The Group's historical credit loss experience does not indicate significantly different loss patterns for these five categories.

As at 31 December 2021	Gross carrying amount	ECL	Loss allowance
Receivables from domestic sales of power	37,859,874	0.00%	–
Receivables from domestic sales of heat	1,617,222	0.00%	–
Receivables from overseas sales of power	1,263,094	0.58%	7,334
Receivables from domestic sales of others	189,162	0.00%	–
Receivables from overseas sales of others	361	0.00%	–
Total	40,929,713		7,334

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(ii) Credit risk *(Cont'd)*

The Group measures loss allowances for other receivables at an amount equal to 12-month ECLs unless there has been a significant increase in credit risk.

Other receivables	Gross carrying amount	Loss allowance
Current (not past due)	3,707,047	179,954
Within 1 year past due	–	–
1 – 3 years past due	–	–
More than 3 years past due	41,274	40,872
	3,748,321	220,826

Expected loss rates are based on actual loss experience over the past 5 years. These rates are adjusted to reflect differences between economic conditions during the period over which the historic data has been collected, the current conditions, and the Group's view of economic conditions over the expected lives of the receivables.

(iii) Liquidity risk

Liquidity risk management is to primarily ensure the ability of the Group to meet its liabilities as and when they are fall due. The liquidity reserve comprises the undrawn borrowing facility and cash and cash equivalents available as at each month end in meeting the Group's liabilities.

The Group maintains flexibility in funding by cash generated by their operating activities and availability of committed credit facilities.

Financial liabilities due within 12 months are presented as current liabilities in the statement of financial position. The cash flows of derivative financial liabilities and repayment schedules of the long-term loans, long-term bonds, other non-current liabilities and lease liabilities are disclosed in Notes 13, 24, 25, 26 and 41, respectively.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(b) Fair value estimation

(i) Fair value measurements

The following table presents the assets and liabilities that are measured at fair value at 31 December 2021 on a recurring basis.

	Level 1	Level 2	Level 3	Total
Recurring fair value measurements				
Assets				
Accounts receivable at fair value through other comprehensive income (Note 18)	–	277,781	–	277,781
Derivatives used for hedging (Note 13)	–	722,211	–	722,211
Other equity instrument investments (Note 10)	6,865	–	722,205	729,070
Total assets	6,865	999,992	722,205	1,729,062
Liabilities				
Derivatives used for hedging (Note 13)	–	140,357	–	140,357
Total liabilities	–	140,357	–	140,357

The following table presents the assets and liabilities that are measured at fair value at 31 December 2020 on a recurring basis.

	Level 1	Level 2	Level 3	Total
Recurring fair value measurements				
Assets				
Accounts receivable at fair value through other comprehensive income (Note 18)	–	1,255,888	–	1,255,888
Derivatives used for hedging (Note 13)	–	184,733	–	184,733
Other equity instrument investments (Note 10)	6,662	–	658,284	664,946
Total assets	6,662	1,440,621	658,284	2,105,567
Liabilities				
Derivatives used for hedging (Note 13)	–	295,001	–	295,001
Total liabilities	–	295,001	–	295,001

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(b) Fair value estimation *(Cont'd)*

(i) Fair value measurements *(Cont'd)*

The fair value of financial instruments traded in active markets is based on quoted market prices at the end of the reporting period. A market is regarded as active if quoted prices are readily and regularly available from an exchange, dealer, broker, industry group, pricing service, or regulatory agency, and those prices represent actual and regularly occurring market transactions on an arm's length basis. The quoted market price used for financial assets held by the Group is the current bid price. These instruments are included in level 1. As at 31 December 2021, instruments included in level 1 were equity instruments in listed securities designated as financial assets measured at fair value through other comprehensive income.

The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques. These valuation techniques maximise the use of relevant observable inputs and minimise the use of unobservable inputs. If all significant inputs required to fair value an instrument are observable, the instrument is included in level 2.

If one or more of the significant inputs is not based on observable market data, the instrument is included in level 3.

Specific valuation techniques used to value financial instruments include:

- The forward exchange contracts and fuel oil swaps are both valued using quoted market prices or dealer quotes for similar instruments.

- The fair value of interest rate swaps is calculated as the present value of the estimated future cash flows based on observable yield curves.

- The fair values of accounts receivable at fair value through other comprehensive income were measured using the discounted cash flow model. The model incorporates various market observable inputs including the annualised yields of similar securitisation products and interest rate curves. The carrying amounts of accounts receivable are the same as their fair values.

- The material other equity instrument investments in unlisted securities are valued using a market-base valuation technique based on assumptions that are not supported by observable market prices or rates. The Group determines comparable public companies based on industry, size, leverage and strategy and calculates an appropriate price multiple, such as price to book ("P/B") multiple for each comparable company identified.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(b) Fair value estimation *(Cont'd)*

(i) Fair value measurements *(Cont'd)*

Below is a summary of significant unobservable inputs to the valuation of financial instruments together with a quantitative sensitivity analysis as at 31 December 2021:

	Valuation technique	Significant Unobservable input	Range	Sensitivity of fair value to the input
Unlisted equity investments	Valuation multiples	Average P/B	2021: 1.05 to 1.15	10% increase/decrease in multiple would result in increase/ decrease in fair value by RMB52.68 million.
		Discount for lack of marketability	2021: 22.17% to 24.39%	10% increase/decrease in multiple would result in decrease/ increase in fair value by RMB15.01 million.

The discount for lack of marketability represents the amounts of premiums and discounts determined by the Group that market participants would take into account when pricing the investments.

During the years ended 31 December 2021 and 2020, there were no transfers of financial instruments between level 1 and level 2, or transfers into or out of level 3.

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(b) Fair value estimation *(Cont'd)*

(i) Fair value measurements *(Cont'd)*

The movements during the year in the balance of the level 3 fair value measurements are as follows:

	As at 31 December	
	2021	2020
Contingent consideration		
Beginning of the year	–	457,727
Movements:		
Profit compensation received from Huaneng Group	–	(457,727)
End of the year	–	–
Total gains for the year included in profit or loss for assets held at the end of the reporting period	–	–

	As at 31 December	
	2021	2020
Other equity instrument investments		
Beginning of the year	**658,284**	770,828
Addition	**111,313**	61,713
Disposal	**(382)**	–
Fair value changes	**(47,010)**	(174,257)
End of the year	**722,205**	658,284
Changes in fair value recognised in other comprehensive income for the year	**(35,258)**	(130,692)

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(b) Fair value estimation *(Cont'd)*

(ii) Fair value disclosures

The carrying value less provision for loss allowances on accounts receivable, other receivables and assets, accounts payable and other liabilities, short-term bonds and short-term loans approximated to their fair values. The fair value of financial liabilities for disclosure purposes is estimated by discounting the future contractual cash flows at the current market interest rate that is available to the Group for similar financial instruments.

The estimated fair values of long-term loans and long-term bonds (both including current maturities) were approximately RMB153.82 billion and RMB36.79 billion as at 31 December 2021 (2020: RMB131.72 billion and RMB33.12 billion), respectively. The aggregate book values of these liabilities were approximately RMB154.07 billion and RMB36.57 billion as at 31 December 2021 (2020: RMB131.89 billion and RMB33.06 billion), respectively.

(c) Capital risk management

The objectives of the Group for managing capital are to safeguard the ability of the Group in continuing as a going concern in order to provide returns for shareholders and benefits for other stakeholders and to maintain an optimal capital structure to reduce the cost of capital.

The Group monitors capital by using debt ratio analysis. This ratio is calculated as total liabilities (sum of current liabilities and non-current liabilities) divided by total assets as shown in the consolidated statement of financial position. During 2021, the strategy of the Group's capital management remained unchanged from 2020. The debt ratio of the Group as at 31 December 2021 was 73.33% (2020: 66.30%).

4 CRITICAL ACCOUNTING ESTIMATES AND JUDGEMENTS

Estimates and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

The Group makes estimates and assumptions concerning the future. The resulting accounting estimates will, by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

4 CRITICAL ACCOUNTING ESTIMATES AND JUDGEMENTS *(Cont'd)*

(a) Accounting estimates on impairment of goodwill

In accordance with the accounting policies stated in Note 2(l), the Group performs annual tests on whether goodwill has suffered any impairment or more frequently if events or changes in circumstances indicate that the carrying value may be impaired. The recoverable amounts of CGU or CGUs to which goodwill has been allocated are determined based on value-in-use calculations. The annual goodwill impairment assessment is complex because the determination of the recoverable amount of the underlying CGUs involves significant estimates and judgements, including the future sales volumes, fuel prices, gross margin and terminal growth rate used to estimate future cash flows and discount rates applied to these forecasted future cash flows of the underlying CGUs. These estimates and judgements may be significantly affected by changes in future market or economic conditions.

(b) Accounting estimates on impairment of property, plant and equipment

In accordance with the accounting policies stated in Note 2(l), the Group reviews at each reporting date to determine whether there is any indication of impairment on property, plant and equipment. If any such indication exists, then the recoverable amount of property, plant and equipment is estimated. The impairment assessment is by determining the recoverable amounts of the CGUs that the PPE are allocated to. The impairment assessment of property, plant and equipment was complex due to the significant estimates and judgements involved in the projections of future cash flows, including the future sales volumes, fuel prices, and discount rates applied to these forecasted future cash flows. These estimates and judgements may be significantly affected by changes in future market or economic conditions.

(c) Deferred tax assets

The Group recognises the deferred tax assets to the extent that it is probable that future taxable profit and taxable temporary differences will be available against which the deductible temporary differences and tax losses carried forward can be utilised, using tax rates that are expected to be applied in the period when the asset is recovered. Recognition of deferred tax assets was complex because it requires significant estimation and judgement, and it involves significant assumptions, including future taxable profits, future tax rates, the reversal of deductible and taxable temporary differences, and the possible utilisation of tax losses carried forward that could be significantly affected by changes in the tax law framework and future market or economic conditions.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION

(a) Disaggregation of revenue

In the following table, revenue is disaggregated by major products and/or service lines of revenue recognition. The table also includes a reconciliation of the disaggregated operating revenue to the Group's reportable segments (Note 5(b)).

For the year ended 31 December 2021	PRC power segment	Overseas segment Note i	All other segments	Inter–segment revenue	Total
– Sales of power and heat	178,213,816	15,437,421	–	–	193,651,237
– Sales of coal and raw materials	2,286,929	657,654	543,648	(446,930)	3,041,301
– Port service	–	–	615,183	(373,198)	241,985
– Transportation service	–	–	232,442	(172,791)	59,651
– Lease income	148,023	1,325,376	–	–	1,473,399
– Others	1,969,036	4,157,381	35,281	(24,188)	6,137,510
Total	182,617,804	21,577,832	1,426,554	(1,017,107)	204,605,083
Revenue:					
– From contracts with customers within the scope of IFRS 15					203,131,684
– From other sources					1,473,399

For the year ended 31 December 2020	PRC power segment	Overseas segment Note i	All other segments	Inter–segment revenue	Total
– Sales of power and heat	150,752,779	10,700,000	–	–	161,452,779
– Sales of coal and raw materials	1,857,484	29,780	–	–	1,887,264
– Port service	–	–	510,765	(312,625)	198,140
– Transportation service	–	–	153,679	(102,155)	51,524
– Lease income	86,136	1,544,118	–	–	1,630,254
– Others	1,392,275	2,823,775	26,161	(15,834)	4,226,377
Total	154,088,674	15,097,673	690,605	(430,614)	169,446,338
Revenue:					
– From contracts with customers within the scope of IFRS 15					167,816,084
– From other sources					1,630,254

Note i: The overseas segment mainly consists of the operations in Singapore and Pakistan.

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(a) Disaggregation of revenue *(Cont'd)*

The revenue from the sale of power and heat and the sale of coal and raw materials is recognised at the point in time upon the transfer of products, whereas the revenue from port service, transportation service, maintenance service, and heating pipeline service is recognised over time during the provision of such services. Lease income is recognised over the lease term.

(b) Segment information

Directors and certain senior management of the Company perform the function as the chief operating decision maker (collectively referred to as the "senior management"). The senior management reviews the internal reporting of the Group in order to assess performance and allocate resources. The Company has determined the operating segments based on these reports. The reportable segments of the Group are the PRC power segment, overseas segment and all other segments (mainly including port and transportation operations). No operating segments have been aggregated to form a reportable segment.

Senior management assesses the performance of the operating segments based on a measure of profit before income tax expense under China Accounting Standards for Business Enterprises ("PRC GAAP") excluding dividend income received from other equity instrument investments, share of profits of China Huaneng Finance Co., Ltd ("Huaneng Finance") and operating results of the centrally managed and resource allocation functions of headquarters ("segment results"). Other information provided, except as noted below, to the senior management of the Company is measured under PRC GAAP.

Segment assets exclude prepaid income tax, deferred income tax assets, other equity instrument investments, investment in Huaneng Finance and assets related to the centrally managed and resource allocation functions of the headquarters that are not attributable to any operating segment ("corporate assets"). Segment liabilities exclude current income tax liabilities, deferred income tax liabilities and liabilities related to the centrally managed and resource allocation functions of the headquarters that are not attributable to any operating segment ("corporate liabilities"). These are part of the reconciliation to total assets and liabilities of the consolidated statement of financial position.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(b) Segment information *(Cont'd)*

All sales among the operating segments have been eliminated as internal transactions when preparing the consolidated financial statements.

(Under PRC GAAP)

	PRC power segment	Overseas segment	All other segments	Total
For the year ended 31 December 2021				
Total revenue	182,617,804	21,577,832	1,426,554	205,622,190
Intersegment revenue	–	–	(1,017,107)	(1,017,107)
External revenue	182,617,804	21,577,832	409,447	204,605,083
Segment results	(15,703,242)	954,815	590,003	(14,158,424)
Interest income	171,655	114,637	1,999	288,291
Interest expense	(7,941,183)	(707,069)	(137,743)	(8,785,995)
Impairment loss	(90,805)	1,711	–	(89,094)
Credit loss	(50,161)	(53,464)	–	(103,625)
Depreciation and amortisation	(20,806,815)	(600,029)	(224,634)	(21,631,478)
Net gain on disposal of non-current assets	528,842	231	11,601	540,674
Share of profits less losses of associates and joint ventures	156,892	–	483,532	640,424
Income tax expense	1,667,483	(42,726)	(21,043)	1,603,714

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(b) Segment information *(Cont'd)*

(Under PRC GAAP)

	PRC power segment	Overseas segment	All other segments	Total
For the year ended 31 December 2020				
Total revenue	154,174,151	15,005,045	690,605	169,869,801
Intersegment revenue	–	–	(430,614)	(430,614)
External revenue	154,174,151	15,005,045	259,991	169,439,187
Segment results	7,634,662	896,315	225,969	8,756,946
Interest income	144,124	145,955	2,680	292,759
Interest expense	(8,096,150)	(943,797)	(152,378)	(9,192,325)
Impairment loss	(6,114,200)	536	–	(6,113,664)
Credit loss	(49,116)	(70,900)	–	(120,016)
Depreciation and amortisation	(20,237,935)	(809,284)	(218,951)	(21,266,170)
Net (loss)/income on disposal of non-current assets	(612,263)	20	(3)	(612,246)
Share of profits less losses of associates and joint ventures	1,316,377	–	298,815	1,615,192
Income tax expense	(3,087,995)	(6,063)	(16,350)	(3,110,408)

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(b) Segment information *(Cont'd)*

(Under PRC GAAP)

	PRC power segment	Overseas segment	All other segments	Total
31 December 2021				
Segment assets	430,142,720	40,378,092	10,938,171	481,458,983
Including:				
Additions to non-current assets (excluding financial assets and deferred income tax assets)	48,632,163	485,642	674,173	49,791,978
Investments in associates	13,962,007	–	4,995,904	18,957,911
Investments in joint ventures	1,367,492	–	1,151,581	2,519,073
Segment liabilities	(337,445,709)	(23,857,688)	(2,655,232)	(363,958,629)

	PRC power segment	Overseas segment	All other segments	Total
31 December 2020				
Segment assets	382,917,976	39,922,997	9,883,826	432,724,799
Including:				
Additions to non-current assets (excluding financial assets and deferred income tax assets)	38,156,544	432,151	186,313	38,775,008
Investments in associates	14,230,345	–	3,855,842	18,086,187
Investments in joint ventures	1,550,986	–	1,193,536	2,744,522
Segment liabilities	(265,407,038)	(23,933,317)	(4,501,554)	(293,841,909)

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(b) Segment information *(Cont'd)*

A reconciliation of external revenue to operating revenue is provided as follows:

	For the year ended 31 December	
	2021	2020
External revenue (PRC GAAP)	**204,605,083**	169,439,187
Reconciling item:		
Impact of restatement under PRC GAAP in relation to business combination under common control*	**–**	(85,477)
Impact of recognition of build-operate-transfer (BOT) related revenue under IFRSs	**–**	92,628
Operating revenue per IFRS consolidated statement of comprehensive income	**204,605,083**	169,446,338

A reconciliation of segment results to profit before income tax expense is provided as follows:

	For the year ended 31 December	
	2021	2020
Segment results (PRC GAAP)	**(14,158,424)**	8,756,946
Reconciling item:		
Loss related to the headquarters	**(309,414)**	(132,234)
Share of profits of Huaneng Finance	**188,956**	188,643
Dividend income of other equity instrument investments	**1,743**	775
Impact of restatement under PRC GAAP in relation to business combination under common control*	**–**	(13,995)
Impact of IFRS adjustments**	**(843,505)**	(4,026,399)
(Loss)/profit before income tax expense per IFRS consolidated statement of comprehensive income	**(15,120,644)**	4,773,736

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(b) Segment information *(Cont'd)*

Reportable segment assets are reconciled to total assets as follows:

	As at 31 December	
	2021	2020
Total segment assets (PRC GAAP)	**481,458,983**	432,724,799
Reconciling items:		
Investment in Huaneng Finance	**1,426,986**	1,394,030
Deferred income tax assets	**5,503,847**	2,996,690
Prepaid income tax	**695,156**	133,090
Other equity instrument investments	**729,070**	664,946
Corporate assets	**254,442**	292,197
Impact of IFRS adjustments**	**10,702,739**	11,698,906
Total assets per IFRS consolidated statement of financial position	**500,771,223**	449,904,658

Reportable segment liabilities are reconciled to total liabilities as follows:

	As at 31 December	
	2021	2020
Total segment liabilities (PRC GAAP)	**(363,958,629)**	(293,841,909)
Reconciling items:		
Current income tax liabilities	**(227,880)**	(288,106)
Deferred income tax liabilities	**(900,885)**	(977,810)
Corporate liabilities	**(1,089,086)**	(1,622,574)
Impact of IFRS adjustments**	**(1,036,730)**	(1,558,061)
Total liabilities per IFRS consolidated statement of financial position	**(367,213,210)**	(298,288,460)

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(b) Segment information *(Cont'd)*

Other material items:

	Reportable segment total	Headquarters	Share of profits of Huaneng Finance	Impact of restatement under PRC GAAP in relation to business combination under common control*	Impact of IFRS adjustments**	Total
For the year ended 31 December 2021						
Total revenue	204,605,083	–	–	–	–	204,605,083
Interest expense	(8,785,995)	(12,205)	–	–	–	(8,798,200)
Depreciation and amortisation	(21,631,478)	(50,986)	–	–	(657,674)	(22,340,138)
Impairment loss	(89,094)	–	–	–	(2,543)	(91,637)
Credit loss	(103,625)	–	–	–	–	(103,625)
Share of profits less losses of associates and joint ventures	640,424	–	188,956	–	(24,994)	804,386
Net gain on disposal of non-current assets	540,674	–	–	–	(19,796)	520,878
Income tax expense	1,603,714	–	–	–	326,041	1,929,755
For the year ended 31 December 2020						
Total revenue	169,439,187	–	–	(85,477)	92,628	169,446,338
Interest expense	(9,192,325)	(37,293)	–	29,006	–	(9,200,612)
Depreciation and amortisation	(21,266,170)	(36,434)	–	26,023	(997,912)	(22,274,493)
Impairment loss	(6,113,664)	–	–	–	(2,811,385)	(8,925,049)
Credit loss	(120,016)	–	–	–	(52,695)	(172,711)
Share of profits less losses of associates and joint ventures	1,615,192	–	188,643	–	(29,513)	1,774,322
Net loss on disposal of non-current assets	(612,246)	–	–	–	(14,411)	(626,657)
Income tax expense	(3,110,408)	–	–	176	947,059	(2,163,173)

* The Group completed the acquisitions of equity interests of certain companies in 2020. As the acquisitions were business combinations under common control, the transactions were accounted for using the pooling of interests method under PRC GAAP. The assets and liabilities acquired in business combinations were measured at the carrying amounts of the acquirees in the consolidated financial statements of the ultimate controlling party on the acquisition date. The operating results for all periods presented were retrospectively restated as if the current structure and operations resulting from the acquisitions had been in existence from the date when the acquirees first became under the control of the same ultimate controlling party. Therefore, the relevant comparative figures in the segment information were restated under PRC GAAP as the acquisitions were accounted for using the acquisition method under IFRSs.

** IFRS adjustments above primarily represented the reclassification adjustments and adjustments related to business combination and borrowing cost. Other than the reclassification adjustments, the differences will be gradually eliminated following subsequent depreciation and amortisation of related assets or the extinguishment of liabilities.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(b) Segment information *(Cont'd)*

Geographical information (Under IFRSs):

(i) External revenue generated from the following countries:

	For the year ended 31 December	
	2021	2020
PRC	**183,027,251**	154,348,665
Overseas	**21,577,832**	15,097,673
Total	**204,605,083**	169,446,338

The geographical location of customers is based on the location at which the electricity was transferred, goods were delivered, and services were provided.

(ii) Non-current assets (excluding financial assets and deferred income tax assets) are located in the following countries:

	As at 31 December	
	2021	2020
PRC	**371,244,403**	346,766,179
Overseas	**22,087,875**	23,275,028
Total	**393,332,278**	370,041,207

The non-current asset information above is based on the locations of the assets.

The information on sales to major customers of the Group which accounted for 10% or more of external revenue is as follows:

In 2021, the revenue from grid companies under common control of State Grid Corporation of China within the PRC power segment in total accounted for 70% of external revenue (2020: 77%). The sales to a subsidiary of State Grid Corporation of China which accounted for 10% or more of external revenue are as follows:

	For the year ended 31 December			
	2021 Amount	**Proportion**	2020 Amount	Proportion
State Grid Shandong Electric Power Company	**30,346,435**	**15%**	27,265,600	16%

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(c) Contract balances

The contract assets primarily relate to the Group's rights to consideration for service completed but not billed at the reporting date. The contract assets are transferred to receivables when the rights become unconditional according to the contract.

The contract liabilities primarily relate to the advance received from customers for heat sales and heating pipeline upfront fees. The contract liabilities of RMB324 million (2020: RMB242 million) at the beginning of the year has been recognised as revenue of heating pipeline service in 2021 (2020). The contract liabilities of RMB2,199 million (2020: RMB2,055 million) at the beginning of the year has been recognised as revenue of heat sales in 2021 (2020).

(i) The transaction prices allocated to remaining performance obligations (unsatisfied or partially unsatisfied) are as follows:

	As at 31 December	
	2021	2020
Within 1 year	**208,668**	268,001
Over 1 year	**2,685,875**	2,355,763
Total (Note 26)	**2,894,543**	2,623,764

The transaction prices allocated to the above remaining performance obligations expected to be recognised in more than one year relate to the provision of heating pipeline services, of which the performance obligations are to be satisfied within 17 years. All the other amounts of transaction prices allocated to the remaining performance obligations are expected to be recognised as revenue within one year. The amount disclosed above does not include variable consideration which is constrained.

(ii) Performance obligations

The Group has elected the practical expedient of not disclosing the remaining obligation excluding heating pipeline upfront fees. As allowed by IFRS 15, no information is provided about the performance obligations at 31 December 2021 that have an original expected duration of one year or less.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

6 (LOSS)/PROFIT BEFORE INCOME TAX EXPENSE

(Loss)/profit before income tax expense was determined after charging/(crediting) the following:

	For the year ended 31 December	
	2021	2020
Total interest expense on borrowings	**10,096,884**	10,128,467
Less: amounts capitalised in property, plant and equipment	**1,298,684**	927,855
Interest expense charged to the consolidated statement of comprehensive income	**8,798,200**	9,200,612
Including: Interest expense on lease liabilities	**169,696**	202,264
Depreciation of property, plant and equipment	**21,490,876**	21,337,932
Depreciation of investment properties	**30,162**	22,866
Depreciation of right-of-use assets	**749,383**	785,518
Included in other investment (income)/loss		
– Dividends on other equity instrument investments	**(1,743)**	(775)
– Investment loss of derivative financial instruments	**–**	74,870
– Other	**(5,772)**	(5,588)
Included in loss on fair value changes of financial assets/liabilities		
– Loss on fair value changes of trading derivatives	**–**	1,566

6 (LOSS)/PROFIT BEFORE INCOME TAX EXPENSE *(Cont'd)*

	For the year ended 31 December	
	2021	2020
Included in other operating expenses:		
– Operating expense of Ruyi Pakistan Energy	**3,943,171**	2,581,665
– Service concession construction cost	**148,578**	103,177
– Other materials expense	**1,611,493**	1,626,385
– Electricity charges	**1,109,709**	973,372
– Cost of sales of raw materials	**1,125,710**	295,330
– Water charges	**617,595**	549,260
– Insurance expense	**413,985**	386,435
– Cleaning, greening and fire protection expense	**440,704**	430,476
– Purchase of power generation quota	**231,233**	392,902
– Transportation allowance	**190,532**	179,955
– Pollutant charge	**98,037**	137,579
– Water conservancy fund and disabled security fund	**92,199**	471,129
– Test and inspection expense	**341,511**	359,997
– Service charge	**335,874**	333,916
– Heating pipeline related cost	**159,990**	134,915
– Auditors' remuneration audit services	**32,996**	39,117
– Other consulting expense	**114,361**	97,559
– Office expense	**276,561**	223,913
– Minimum lease payments under operating leases, lease payments not included in the measurement of lease liabilities	**114,909**	106,031
– Amortisation of other non-current assets	**69,717**	128,177
– Property management expense	**99,561**	95,037
– Information technology maintenance expense	**245,027**	229,214
– Travel expense	**128,458**	99,106
– Business entertainment expense	**39,678**	28,553
– Research and development expenditure	**1,324,735**	667,592
– Net loss on disposal of materials and supplies	**13,575**	167,449
– Net (gain)/loss on disposal of non-current assets	**(520,878)**	626,657
– Recognition of loss allowance for receivables*	**103,625**	172,711
– (Reversal)/recognition of provision for inventory obsolescence (Note 16)	**(242)**	43,076
– Impairment loss on property, plant and equipment	**28,879**	7,847,378
– Impairment loss on goodwill	**–**	685,036
– Impairment loss on other non-current assets*	**63,000**	349,559
– Gain on Three Supplies and Property Management	**(36,835)**	(126,425)
– Government grants**	**(2,013,149)**	(739,740)
– Penalties	**45,349**	22,279
– Donations	**37,707**	55,663
– Others	**675,423**	525,637
Total	**11,702,778**	20,300,072

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

6 (LOSS)/PROFIT BEFORE INCOME TAX EXPENSE *(Cont'd)*

* The loss allowance for receivables included in other non-current assets was recorded in the item of "Recognition of loss allowance for receivables".

** For the year ended 31 December 2021, among the government grants, there were standby compensation of Huaneng Power International, Inc. Jining Power Plant, heating subsidies, VAT refund and coal guarantee fund amounting to RMB707 million, RMB208 million, RMB212 million and RMB197 million. There are no unfulfilled conditions or contingencies relating to these grants.

7 PROPERTY, PLANT AND EQUIPMENT

	Dams	Port facilities	Buildings	Electric utility plant in service	Transportation facilities	Others	CIP	Total
As at 1 January 2020								
Cost	2,305,554	3,975,987	12,916,746	488,256,686	1,410,233	8,429,661	38,949,263	556,244,130
Accumulated depreciation	(343,836)	(525,192)	(4,614,648)	(241,169,240)	(556,149)	(5,191,819)	–	(252,400,884)
Accumulated impairment losses	(402,212)	(439,190)	(236,123)	(14,796,384)	(993)	(81,445)	(2,263,992)	(18,220,339)
Net book value	1,559,506	3,011,605	8,065,975	232,291,062	853,091	3,156,397	36,685,271	285,622,907
Year ended 31 December 2020								
Beginning of the year	1,559,506	3,011,605	8,065,975	232,291,062	853,091	3,156,397	36,685,271	285,622,907
Acquisition	–	–	11,222	975,303	–	4,081	1,878	992,484
Additions	–	–	12,839	622,380	–	163,389	42,976,346	43,774,954
Transfer from CIP	4,773	24,938	447,047	27,265,667	7,305	259,431	(28,009,161)	–
Other additions	–	–	23,652	189,847	–	9,185	–	222,684
Reclassification to investment property	–	–	(1,348)	–	–	–	–	(1,348)
Disposals/write-off	–	–	(10,259)	(594,632)	(24)	(9,613)	–	(614,528)
Depreciation charge	(43,218)	(126,252)	(537,815)	(20,139,034)	(59,926)	(468,716)	–	(21,374,961)
Impairment charge	(92,026)	–	(109,205)	(7,552,442)	–	(24,875)	(68,830)	(7,847,378)
Reclassification	(73,290)	–	124,978	38,186	(75,100)	(14,774)	–	–
Other decrease	–	–	–	(262,788)	–	–	–	(262,788)
Currency translation differences	–	–	–	(332,568)	–	(3,476)	(4,840)	(340,884)
End of the year	1,355,745	2,910,291	8,027,086	232,500,981	725,346	3,071,029	51,580,664	300,171,142
As at 1 January 2021								
Cost	2,218,159	4,000,925	13,496,843	511,570,031	1,334,131	8,504,371	53,909,608	595,034,068
Accumulated depreciation	(402,811)	(651,444)	(5,127,671)	(256,998,944)	(608,003)	(5,331,854)	–	(269,120,727)
Accumulated impairment losses	(459,603)	(439,190)	(342,086)	(22,070,106)	(782)	(101,488)	(2,328,944)	(25,742,199)
Net book value	1,355,745	2,910,291	8,027,086	232,500,981	725,346	3,071,029	51,580,664	300,171,142

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

	Dams	Port facilities	Buildings	Electric utility plant in service	Transportation facilities	Others	CIP	Total
Year ended 31 December 2021								
Beginning of the year	1,355,745	2,910,291	8,027,086	232,500,981	725,346	3,071,029	51,580,664	300,171,142
Acquisition	–	–	14,518	328,410	–	20,590	–	363,518
Additions	–	–	40,337	813,507	100	111,166	41,441,055	42,406,165
Transfer from CIP	4,390	3,567	635,095	41,837,300	645	427,103	(42,908,100)	–
Other additions	–	–	21,305	69,074	4,079	4,890	–	99,348
Reclassification to investment property	–	–	(45,026)	–	–	–	–	(45,026)
Disposals/write-off	–	(29,505)	(4,619)	(101,843)	–	(3,888)	–	(139,855)
Depreciation charge	(37,251)	(127,260)	(581,157)	(20,225,793)	(67,660)	(481,280)	–	(21,520,401)
Impairment charge	–	–	–	(27,949)	–	(930)	–	(28,879)
Reclassification	1	–	1,392,362	(1,622,016)	8,250	221,403	–	–
Other decrease	–	–	(229)	(432,323)	–	(1,037)	–	(433,589)
Currency translation differences	–	–	–	(266,085)	–	(8,843)	(7,870)	(282,798)
End of the year	1,322,885	2,757,093	9,499,672	252,873,263	670,760	3,360,203	50,105,749	320,589,625
As at 31 December 2021								
Cost	2,222,549	3,973,839	15,716,208	549,459,275	1,352,671	9,152,056	50,105,749	631,982,347
Accumulated depreciation	(440,062)	(777,556)	(5,884,746)	(274,980,787)	(681,129)	(5,688,837)	–	(288,453,117)
Accumulated impairment losses	(459,602)	(439,190)	(331,790)	(21,605,225)	(782)	(103,016)	–	(22,939,605)
Net book value	1,322,885	2,757,093	9,499,672	252,873,263	670,760	3,360,203	50,105,749	320,589,625

Interest capitalisation

Interest expense of approximately RMB1,299 million (2020: RMB928 million) arising on borrowings for the construction of property, plant and equipment was capitalised during the year and was included in 'Additions' in property, plant and equipment. The weighted average capitalisation rate was approximately 3.85% (2020: 4.12%) per annum.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Security

As at 31 December 2021 and 2020, certain property, plant and equipment were pledged to banks as collateral for short-term (Note 30) and long-term loans (Note 24).

Buildings without ownership certificates

At 31 December 2021, the Group was in the process of applying for the ownership certificates for certain buildings (buildings for power generation were included in electric utility plant in service) with an aggregate net book value of RMB5,145 million (2020: RMB6,209 million). Management is of the opinion that the Group is entitled to lawfully and validly occupy and use of the abovementioned buildings. There have been no litigations, claims or assessments against the Group for compensation with respect to the use of these buildings as at the date of approval of these financial statements.

Impairment

For the year ended 31 December 2021, the Group recognised impairment loss on property, plant and equipment amounting to RMB29 million (for the year ended 31 December 2020: RMB7,847 million).

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES

	2021	2020
Beginning of the year	**22,375,377**	20,783,259
Capital injections in associates and joint ventures	**852,323**	596,877
Share of net profit less loss	**804,386**	1,774,322
Share of other comprehensive loss	**(44,304)**	(182,849)
Share of other capital reserve of equity-method investees	**1,086**	7,607
Dividends	**(950,964)**	(603,839)
End of the year	**23,037,904**	22,375,377

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES *(Cont'd)*

As at 31 December 2021, investments in associates and joint ventures of the Group are unlisted except for Shenzhen Energy Corporation Limited ("SECL"), which is listed on the Shenzhen Stock Exchange. The following list contains only the particulars of material associates and joint ventures:

Name	Country of incorporation	Registered capital	Business nature and scope of operation	Percentage of equity interest held Direct	Indirect[1]
Associates:					
Huaneng Sichuan Energy Development Co., Ltd.("Sichuan Energy Development")	PRC	RMB1,469,800,000	Development, investment, construction, operation and management of hydropower	49%	–
SECL*	PRC	RMB4,757,389,916	Energy and investment in related industries	25.02%	–
Hebei Hanfeng Power Generation Limited Liability Company ("Hanfeng Power")	PRC	RMB1,975,000,000	Power generation	40%	–
Huaneng Finance	PRC	RMB5,000,000,000	Provision of financial service, including fund deposit and lending services, finance lease arrangements, notes discounting and entrusted loans and investment arrangements within Huaneng Group	20%	–
China Huaneng Group Fuel Co., Ltd. ("Huaneng Group Fuel Company") **	PRC	RMB3,000,000,000	Wholesale of coal, import and export of coal	50%	–
Hainan Nuclear Power Limited Liability Company ("Hainan Nuclear")	PRC	RMB5,141,810,000	Construction and operation of nuclear power plants; production and sales of electricity and related products	30%	–

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES *(Cont'd)*

Name	Country of incorporation	Registered capital	Business nature and scope of operation	Percentage of equity interest held Direct	Indirect[1]
Joint ventures:					
Shanghai Time Shipping Co., Ltd. ("Shanghai Time Shipping")	PRC	RMB1,200,000,000	International and domestic sea transportation	50%	–
Jiangsu Nantong Power Generation Co., Ltd. ("Jiangsu Nantong Power")[1]	PRC	RMB1,596,000,000	Operation and management of power generation plants and transportation related projects	–	35%

[1] The indirect percentage of equity interest held represents the effective ownership interest of the Group.

* As at 31 December 2021, the fair value of the Group's shares in SECL was RMB9,640 million (2020: RMB7,248 million).

** In accordance with the articles of association of the investee, the Group could only exercise significant influence on the investee and therefore accounted for the investment under the equity method.

All the above associates and joint ventures are accounted for under the equity method in the consolidated financial statements.

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES *(Cont'd)*

Summarised financial information of the material associates, adjusted for any differences in accounting policies and acquisition adjustments, and reconciliation to the carrying amounts in the consolidated financial statements, are disclosed below:

	Sichuan Energy Development		SECL		Huaneng Finance		Hanfeng Power		Huaneng Group Fuel Company		Hainan Nuclear	
	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
Gross amounts of the associates'												
Current assets	1,011,553	825,632	27,003,410	21,111,690	33,699,466	27,426,242	946,505	964,515	17,257,003	5,263,174	1,895,782	1,894,806
Non-current assets	15,969,523	14,836,413	104,596,390	92,332,480	18,287,225	20,003,370	1,169,435	1,279,233	3,502,773	3,641,641	18,912,695	19,826,469
Current liabilities	(4,346,583)	(3,731,524)	(27,078,010)	(22,565,250)	(44,746,000)	(40,458,908)	(520,045)	(328,093)	(13,851,633)	(3,066,531)	(4,183,200)	(4,025,596)
Non-current liabilities	(7,720,769)	(7,171,879)	(54,855,980)	(48,951,200)	(105,762)	(553)	(15,718)	(36,218)	(2,934,343)	(1,780,436)	(11,948,437)	(13,041,682)
Equity	4,913,724	4,758,642	49,665,810	41,927,720	7,134,929	6,970,151	1,580,177	1,879,437	3,973,800	4,057,848	4,676,840	4,653,997
– Equity attributable to shareholders	3,685,293	3,568,982	27,264,740	27,346,169	7,134,929	6,970,151	1,580,177	1,879,437	3,582,981	3,688,698	4,676,840	4,653,997
– Non-controlling interests	1,228,431	1,189,660	22,401,070	14,581,551	–	–	–	–	390,819	369,150	–	–
Revenue	2,489,554	2,396,218	29,975,740	20,597,600	1,606,826	1,600,537	1,779,286	1,873,548	68,257,609	29,928,618	3,442,936	3,367,222
Gross profit/(loss)	1,246,712	701,606	6,091,800	5,952,100	955,394	1,014,653	(236,323)	22,637	496,741	284,754	789,660	1,131,729
Net profit/(loss)	662,406	555,009	2,367,920	4,248,550	944,778	943,215	(276,684)	6,426	28,167	222,488	8,634	77,037
Profit/(loss) from continuing operations attributable to shareholders	410,948	348,660	2,281,820	3,929,390	944,778	943,215	(276,684)	6,426	(2,836)	207,297	8,634	77,037
Other comprehensive loss attributable to shareholders	–	–	(150,771)	(578,559)	–	(153,979)	–	–	(2,881)	(8,695)	–	–
Total comprehensive income/(loss) attributable to shareholders	410,948	348,660	2,131,049	3,350,831	944,778	789,236	(276,684)	6,426	(5,717)	198,602	8,634	77,037
Dividend received from the associates	144,520	98,449	309,423	49,587	156,000	180,000	–	–	50,000	50,000	–	–

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES *(Cont'd)*

	Sichuan Energy Development		SECL		Huaneng Finance		Hanfeng Power		Huaneng Group Fuel Company		Hainan Nuclear	
	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020
Reconciled to the interests in the associates												
Gross amounts of net assets attributable to shareholders of the associates	3,685,293	3,568,982	27,264,740	27,346,169	7,134,929	6,970,151	1,580,177	1,879,437	3,582,981	3,688,698	4,676,840	4,653,997
The Group's effective interest	49%	49%	25.02%	25.02%	20%	20%	40%	40%	50%	50%	30%	30%
The Group's share of net assets attributable to shareholders of the associates	1,805,794	1,748,801	6,821,638	6,842,011	1,426,986	1,394,030	632,071	751,775	1,791,491	1,844,349	1,403,052	1,396,199
Impact of adjustments	207,586	207,586	1,161,810	1,161,810	–	–	293,082	293,082	16,521	16,521	14,076	14,076
Carrying amount in the consolidated financial statements	2,013,380	1,956,387	7,983,448	8,003,821	1,426,986	1,394,030	925,153	1,044,857	1,808,012	1,860,870	1,417,128	1,410,275

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES *(Cont'd)*

Summarised financial information of material joint ventures adjusted for any differences in accounting policies and acquisition adjustment, and reconciliation to the carrying amount in the consolidated financial statements, are disclosed below:

	Shanghai Time Shipping		Jiangsu Nantong Power	
	2021	2020	**2021**	2020
Gross amounts of joint ventures'				
Current assets	**482,732**	318,387	**1,296,242**	742,195
Non-current assets	**3,666,424**	3,910,739	**4,585,414**	4,740,502
Current liabilities	**(2,204,087)**	(2,375,821)	**(2,746,397)**	(2,046,053)
Non-current liabilities	**(197,496)**	–	**(1,396,877)**	(1,318,905)
Equity	**1,747,573**	1,853,305	**1,738,382**	2,117,739
Revenue	**2,028,494**	1,143,885	**3,996,964**	3,118,059
Gross profit/(loss)	**567,470**	169,040	**(368,485)**	541,305
Net profit/(loss)	**300,268**	11,325	**(357,719)**	240,436
Total comprehensive income/(loss)	**300,268**	11,325	**(357,719)**	240,436
Dividend received in cash from the joint ventures	**50,000**	–	**10,820**	126,215
Reconciled to the interests in the joint ventures:				
Gross amounts of net assets	**1,747,573**	1,853,305	**1,738,382**	2,117,739
The Group's effective interest rates	**50%**	50%	**50%**	50%
The Group's share of net assets	**873,787**	926,653	**869,191**	1,058,870
Impact of adjustments	**18,324**	18,324	**–**	–
Carrying amount in the consolidated financial statements	**892,111**	944,977	**869,191**	1,058,870

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES *(Cont'd)*

Aggregate information of associates and joint ventures that are not individually material:

	2021	2020
Aggregate carrying amount of individually immaterial associates and joint ventures in the consolidated financial statements	**5,702,495**	4,701,290
Aggregate amounts of the Company and its subsidiaries' share of those associates and joint ventures Profit from continuing operations	**236,306**	190,029
Total comprehensive income	**235,475**	190,029

As at 31 December 2021, the Group's share of losses of associates exceeded its interests in the associates and the unrecognised further losses amounted to RMB563 million (2020: RMB552 million).

As at 31 December 2021, there were no proportionate interests in the associates' and joint ventures' capital commitments (31 December 2020: Nil). There were no material contingent liabilities relating to the Group's interests in the associates and joint ventures, and the associates and joint ventures themselves.

9 INVESTMENTS IN SUBSIDIARIES

As at 31 December 2021, the investments in subsidiaries of the Group, all of which are unlisted, are as follows:

(i) Subsidiaries acquired through establishment or investment

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng International Power Fuel Limited Liability Company	PRC	Held directly	RMB200,000,000	Wholesale of coal	100%	100%
Huaneng Nantong Power Generation Limited Liability Company	PRC	Held indirectly	RMB798,000,000	Power generation	70%	70%
Huaneng Yingkou Co-generation Limited Liability Company	PRC	Held directly	RMB875,675,300	Production and sale of electricity and heat, and sale of coal ash and lime	100%	100%
Huaneng Hunan Xiangqi Hydropower Co., Ltd.	PRC	Held directly	RMB328,000,000	Construction, operation and management of hydropower plants and related projects	100%	100%
Huaneng Zuoquan Coal-fired Power Generation Limited Liability Company	PRC	Held directly	RMB960,996,200	Construction, operation and management of electricity projects; development and utilisation of clean energy resources	80%	80%
Huaneng Kangbao Wind Power Utilisation Limited Liability Company	PRC	Held directly	RMB543,200,000	Construction, operation and management of wind power plants and related projects; solar power generation	100%	100%
Huaneng Jiuquan Wind Power Generation Co., Ltd.	PRC	Held directly	RMB2,761,480,000	Construction, operation and management of wind power generation and related projects	100%	100%
Huaneng Rudong Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB90,380,000	Operation and management of wind power generation projects	90%	90%
Huaneng Guangdong Haimen Port Limited Liability Company	PRC	Held indirectly	RMB331,400,000	Loading, warehousing and conveying services, providing facility services and water transportation services	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Taicang Port Limited Liability Company	PRC	Held indirectly	RMB600,000,000	Port provision, cargo loading and storage	85%	85%
Huaneng Taicang Power Generation Co., Ltd.	PRC	Held indirectly	RMB883,899,310	Power generation	75%	75%
Huaneng Huaiyin II Power Generation Limited Company	PRC	Held indirectly	RMB930,870,000	Power generation	63.64%	63.64%
Huaneng Xindian Power Generation Co., Ltd.	PRC	Held directly	RMB991,915,789	Power generation	95%	95%
Huaneng Shanghai Combined Cycle Power Limited Liability Company	PRC	Held directly	RMB699,700,000	Power generation	70%	70%
Huaneng Yumen Wind Power Generation Co., Ltd.	PRC	Held directly	RMB785,960,000	Construction, operation and management of wind power generation and related projects	100%	100%
Huaneng Qingdao Co-generation Limited Company	PRC	Held directly	RMB498,729,045	Construction, operation and management of co-generation power plants and related projects	100%	100%
Huaneng Tongxiang Combined Cycle Co-generation Co., Ltd.	PRC	Held directly	RMB300,000,000	Production and sale of electricity and heat; investment in combined cycle co-generation industries	95%	95%
Huaneng Shantou Haimen Power Generation Limited Liability Company	PRC	Held indirectly	RMB1,508,000,000	Construction, operation and management of power plants and related projects	80%	80%
Huaneng Chongqing Liangjiang Power Generation Limited Liability Company	PRC	Held directly	RMB871,920,000	Construction, operation and management of natural gas power plants and related projects	75%	75%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Yunnan Fuyuan Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB326,290,000	Wind power project investment, management and sales	100%	100%
Huaneng Guizhou Panzhou State City Wind Power Co., Ltd.	PRC	Held directly	RMB188,180,000	Construction and management of wind power plants and related projects	100%	100%
Huaneng Jiangxi Clean Energy Limited Liability Company	PRC	Held directly	RMB1,384,502,000	Power generation and supply development, management and construction of clean energy resource	100%	100%
Huaneng Hunan Subaoding Wind Power Generation Co., Ltd.	PRC	Held directly	RMB266,000,000	Construction, operation and management of wind power plants and related projects	100%	100%
Huaneng Suixian Jieshan Wind Power Generation Co., Ltd.	PRC	Held directly	RMB183,500,000	Construction, operation and management of wind power plants and related projects	100%	100%
Huaneng Taiyuan Dongshan Combined Cycle Co-generation Co., Ltd.	PRC	Held directly	RMB731,710,000	Construction and operation of thermal heating networks, development and utilisation of clean energy resources	82%	82%
Huaneng Xuzhou Tongshan Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB287,951,400	Wind power generation, electricity engineering design services, maintenance of power supply and control facilities, solar energy power generation	70%	70%
Huaneng Nanjing Co-generation Co., Ltd.	PRC	Held indirectly	RMB320,400,000	Construction and operation of power plants, and thermal heating services	70%	70%
Huaneng Hunan Guidong Wind Power Generation Co., Ltd.	PRC	Held directly	RMB140,000,000	Investment, construction, operation and management of electricity projects; development and utilisation of clean energy resources	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Nanjing Luhe Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB84,800,000	Investment, construction, operation, management of electricity projects; development and utilisation of clean energy resources	100%	100%
Huaneng Luoyuan Power Generation Co., Ltd.	PRC	Held indirectly	RMB1,163,100,000	Construction, operation and management of power plants and related projects	100%	100%
Huaneng Lingang (Tianjin) Gas Co-generation Co., Ltd.	PRC	Held directly	RMB332,000,000	Power generation and supply	100%	100%
Huaneng Lingang (Tianjin) Heat Co-generation Co., Ltd.	PRC	Held indirectly	RMB5,000,000	Providing thermal energy and cold energy services, supplying steam and hot water (except portable water), plumbing pipe installation and repair, energy engineering construction	66%	66%
Huaneng Anhui Huaining Wind Power Generation Co., Ltd.	PRC	Held directly	RMB301,500,000	Investment, construction and operation of electricity projects development and utilisation of clean energy resources	100%	100%
Huaneng Mianchi Co-generation Limited Liability Company	PRC	Held directly	RMB570,000,000	Construction, operation and management of coal-fired plants and related projects	60%	60%
Huaneng Yingkou Xianrendao Co-generation Co., Ltd.	PRC	Held directly	RMB352,020,000	Power generation and supply development and utilisation of clean energy resources	100%	100%
Huaneng Nanjing Xingang Comprehensive Energy Co., Ltd.	PRC	Held indirectly	RMB198,664,300	Thermal generation and supply, power distribution and sale	65%	65%
Huaneng Changxing Photovoltaic Power Generation Limited Liability Company	PRC	Held indirectly	RMB26,000,000	Construction and operation of distributed photovoltaic power generation plants and related projects	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Rudong Baxianjiao Offshore Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB1,629,338,700	Infrastructure construction of wind power plants	70%	70%
Huaneng Guilin Gas Distributed Energy Co., Ltd.	PRC	Held directly	RMB267,450,000	Construction, operation and management of power plants and thermal energy	80%	80%
Huaneng (Dalian) Co-generation Co., Ltd.	PRC	Held directly	RMB1,015,851,769	Construction, operation and management of co-generation power plants and related projects	100%	100%
Huaneng Zhongxiang Wind Power Generation Co., Ltd.	PRC	Held directly	RMB240,000,000	Construction, operation and management of wind power plants and related projects	100%	100%
Huaneng International Power Hong Kong Limited Company	Hong Kong	Held directly	100,000 Shares	Development, construction management and operation of power supply, coal projects; related investment and financing businesses	100%	100%
Tuas Power Generation Pte. Ltd. ("TPG")	Singapore	Held indirectly	S$1,183,000,001	Power generation and related by-products, derivatives, developing power supply resources operating electricity and power sales	100%	100%
TP Utilities Pte. Ltd.	Singapore	Held indirectly	S$255,500,001	Provision of energy, power supply, thermal supply, management of industrial water and waste	100%	100%
TPSTMWR	Singapore	Held indirectly	S$4,500,000	Providing desalinated water	60%	60%
TP-STM Water Services Pte. Ltd.	Singapore	Held indirectly	S$21,000	Providing desalinated water	60%	60%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Mianchi Clean Energy Limited Liability Company	PRC	Held directly	RMB291,800,000	Wind power generation, new energy development and utilisation	100%	100%
Huaneng Zhuolu Clean Energy Limited Liability Company	PRC	Held directly	RMB159,178,100	Construction, operation and management of power plants and related projects	100%	100%
Huaneng Tongwei Wind Power Generation Limited Liability Company	PRC	Held directly	RMB264,640,000	Construction, operation and management of wind power plants and related projects	100%	100%
Huaneng Yizheng Wind Power Generation Limited Liability Company	PRC	Held indirectly	RMB200,000,000	Wind power plants design, construction, management and maintenance	100%	100%
Huaneng Yancheng Dafeng New Energy Power Generation Limited Liability Company	PRC	Held indirectly	RMB1,000,000,000	Construction, operation and management of wind power photovoltaic power plant	100%	100%
Huaneng Shanyin Power Generation Limited Liability Company	PRC	Held directly	RMB1,573,000,000	Construction, operation and management of power plants and related projects	51%	51%
Huaneng Jiangsu Comprehensive Energy Service Co., Ltd.	PRC	Held indirectly	RMB201,000,000	Purchase and sale of electricity and thermal energy, water supply services, construction and operation of electricity distribution networks and heating pipe networks	100%	100%
Huaneng Liaoning Energy Sales Limited Liability Company	PRC	Held directly	RMB200,000,000	Sale of electricity, thermal energy and hot water circulation	100%	100%
Huaneng Guangdong Energy Sales Limited Liability Company	PRC	Held indirectly	RMB200,000,000	Power and thermal energy supply, energy conservation technology service, transmission and substation projects contracting	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Suizhou Power Generation Limited Liability Company	PRC	Held directly	RMB96,020,000	Construction, operation and management of power plants, production and sale of electricity and heat	100%	100%
Huaneng Fuzhou Changle Photovoltaic Power Generation Limited Liability Company	PRC	Held indirectly	RMB15,570,000	Construction, operation and management of photovoltaic power plants and related projects	100%	100%
Huaneng Longyan Wind Power Generation Limited Liability Company	PRC	Held indirectly	RMB35,000,000	Construction, operation and management of wind power plants and related projects	100%	100%
Huaneng Dandong Comprehensive Energy Service Co., Ltd.	PRC	Held directly	RMB17,720,000	Investment, construction operation and management of electricity projects, development and utilisation of clean energy resources	100%	100%
Huaneng Dongguan Combined Cycle Co-generation Limited Liability Company	PRC	Held indirectly	RMB704,490,000	Investment of electricity projects, thermal power generation and supply, investment in heating pipe networks, development and utilisation of clean energy resources	80%	80%
Huaneng Chongqing Fengjie Wind Power Generation Limited Liability Company	PRC	Held directly	RMB183,900,000	Electricity production and supply; development and utilisation of clean energy resources	100%	100%
Huaneng Jingxing Photovoltaic Power Generation Limited Liability Company	PRC	Held directly	RMB23,500,000	Investment, construction and management of photovoltaic power plants	100%	100%
Huaneng Shanxi Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Electricity supply and sales investment, construction, operation and repair of regional transmission and distribution networks	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Chongqing Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Operation of natural gas, electric energy and thermal energy product sale	100%	100%
Huaneng Chongqing Luohuang Energy Sales Limited Liability Company	PRC	Held indirectly	RMB210,000,000	Sale and supply of electricity, sale of thermal products	90%	90%
Huaneng Chongqing Tongliang Energy Sales Limited Liability Company	PRC	Held indirectly	RMB210,000,000	Operation of natural gas, sale of electricity supply, sale of thermal products	51%	51%
Huaneng Hunan Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Electricity and thermal energy product sale	100%	100%
Huaneng Jiangxi Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Construction, operation and management of heat and power supply facilities	100%	100%
Huaneng Hebei Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Construction, installation, maintenance and repair of heat and power supply facilities	100%	100%
Huaneng Henan Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Sale of electricity, heat, gas and other energy products	100%	100%
Huaneng Handan Heating Limited Liability Company	PRC	Held directly	RMB100,000,000	Construction, operation and maintenance of heating sources and pipe networks	100%	100%
Huaneng (Huzhou Development Zone) Photovoltaic Power Generation Limited Liability Company	PRC	Held indirectly	RMB10,000,000	Photovoltaic power generation; power supply, purchase and sale	100%	100%
Huaneng Fujian Energy Sales Limited Liability Company	PRC	Held indirectly	RMB210,000,000	Sale of electricity, heat, gas and other energy products	100%	100%
Huaneng Hubei Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Sale of electricity, heat, gas and other energy products	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng (Sanming) Clean Energy Limited Liability Company	PRC	Held indirectly	RMB500,000	Construction, operation and management of wind power, photovoltaic power station and related projects	100%	100%
Huaneng Yueyang Xingang Photovoltaic Power Generation Limited Liability Company	PRC	Held directly	RMB16,000,000	Construction, operation and management of electricity projects, development and utilisation of clean energy	60%	60%
Huaneng Shanghai Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Power supply (except construction and operation of electricity networks), technology services in energy conservation and environmental protection	100%	100%
Huaneng Anhui Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Sale of electricity, heat, gas and other energy products	100%	100%
Huaneng (Shanghai) Power Maintenance Limited Liability Company	PRC	Held directly	RMB200,000,000	Contracting installation and repair of electricity facilities	100%	100%
Huaneng Guanyun Clean Energy Power Limited Liability Company	PRC	Held indirectly	RMB1,446,020,000	Sale of electricity, construction, operation and management of co-generation power plants, heating network and expansion engineering	100%	100%
Huaneng Jianchang Photovoltaic Power Generation Limited Liability Company	PRC	Held directly	RMB10,000,000	Production and supply of electricity, and development and utilisation of clean energy resources	100%	100%
Huaneng Chaoyang Photovoltaic Power Generation Limited Liability Company	PRC	Held directly	RMB10,000,000	Production and supply of electricity, and development and utilisation of clean energy resources	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng (Fujian) Port Limited Company	PRC	Held indirectly	RMB619,710,000	Port management, investment and development	100%	100%
Huaneng Shijiazhuang Energy Limited Liability Company	PRC	Held directly	RMB60,000,000	Production and supply of heat and purchase and sale of electricity	100%	100%
Huaneng Jiangyin Combined Cycle Co-generation Limited Liability Company	PRC	Held indirectly	RMB600,000,000	Production and supply of electricity, and production and supply of heat	51%	51%
Huaneng Anyang Energy Limited Liability Company	PRC	Held directly	RMB619,600,000	Production and supply of electricity, and production and supply of heat	100%	100%
Huaneng Shanxi Comprehensive Energy Limited Liability Company	PRC	Held directly	RMB2,086,698,606	Production and supply of electricity, and production and supply of heat	100%	100%
Zhaodong Huaneng Dechang Solar Power Generation Limited Company	PRC	Held indirectly	RMB30,810,000	Solar energy generation and technology promotion, and repair electricity facilities	100%	100%
Huaneng Mingguang Wind Power Generation Limited Liability Company	PRC	Held directly	RMB13,000,000	Production and supply of electricity; investment, construction, operation and management of electricity projects	100%	100%
Huaneng Guangxi Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Power supply, contracting installation and repair of electricity facilities	100%	100%
Huaneng Hunan Lianping Wind Power Generation Limited Liability Company	PRC	Held directly	RMB173,920,000	Production and supply of electricity	80%	80%
Huaneng Abagaqi Clean Energy Limited Liability Company	PRC	Held directly	RMB316,180,760	Production, supply and sale of electricity and thermal energy	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Jiashan Photovoltaic Power Generation Limited Liability Company	PRC	Held indirectly	RMB10,000,000	Production and supply of electricity	100%	100%
Huaneng Zhejiang Energy Sales Limited Liability Company	PRC	Held indirectly	RMB210,000,000	New energy technology development and technology consulting	100%	100%
Huaneng Guangdong Shantou Power Generation Limited Liability Company	PRC	Held indirectly	RMB10,000,000	Production and supply of electricity and thermal energy	100%	100%
Huaneng Shantou Photovoltaic Power Generation Limited Liability Company	PRC	Held indirectly	RMB100,000	Production and supply of electricity	100%	100%
Huaneng Guigang Clean Energy Limited Liability Company	PRC	Held directly	RMB173,810,000	Production and supply of electricity, and investment, construction and operation of electricity projects	100%	100%
Huaneng Changxing Jiapu Photovoltaic Power Generation Limited Liability Company	PRC	Held indirectly	RMB10,000,000	Production and supply of electricity, and investment, construction and operation of electricity projects	100%	100%
Huaneng Hainan Energy Sales Limited Liability Company (i)	PRC	Held indirectly	RMB210,000,000	Construction and operation of heat and power supply facilities, operation of heat resources, heat networks and power supply facilities	91.80%	100%
Huaneng Yangpu Co-generation Limited Company (i)	PRC	Held indirectly	RMB802,222,000	Investment, construction, operation and management of electricity projects and heat pipe networks	82.62%	90.00%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Zhejiang Pinghu Offshore Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB2,200,000,000	Production and supply of electricity, and investment, construction and operation of electricity projects	100%	100%
Huaneng Liaoning Clean Energy Limited Liability Company	PRC	Held directly	RMB170,000,000	Technology development technical advice services for clean energy	100%	100%
Jiangsu Huaneng Zhongyang New Energy Power Generation Co., Ltd.	PRC	Held indirectly	RMB28,000,000	Production and supply of electricity, investment, construction and operation of electricity projects	75%	75%
Huaneng Henan Puyang Clean Energy Limited Liability Company	PRC	Held directly	RMB1,491,567,000	Production and supply of electricity, and investment, construction and operation of electricity projects	100%	100%
Huaneng Guizhou Energy Sales Co., Ltd.	PRC	Held directly	RMB210,000,000	Sale of electricity, heat and gas	100%	100%
Huaneng Guangdong Shantou Offshore Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB62,950,000	Investment and development of wind energy and new energy	100%	100%
Jiyuan Huaneng Energy Sales Co., Ltd. ("Jiyuan Energy Sales")(xi)	PRC	Held indirectly	RMB20,000,000	Sale of electricity, heat and gas	51%	100%
Huaneng Yushe Poverty Relief Energy Co., Ltd.	PRC	Held indirectly	RMB14,760,000	Construction, operation and management of photovoltaic power generation and new energy projects	90%	90%
Huaneng Anhui Mengcheng Wind Power Co., Ltd.	PRC	Held directly	RMB409,070,000	Production and supply of electricity, and investment, construction and operation of electricity projects	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Anshun Comprehensive Energy Co., Ltd.	PRC	Held directly	RMB10,530,000	Production and supply of electricity, and investment, construction and operation of electricity projects	100%	100%
Huaneng Shengdong Rudong Offshore Wind Power Co., Ltd.	PRC	Held indirectly	RMB2,000,000,000	Production and sale of electric power; investment in wind power generation	79%	79%
Huaneng Zhejiang Cangnan Offshore Wind Power Co., Ltd.	PRC	Held directly	RMB10,000,000	Production and sale of electric power; and investment in wind power generation	100%	100%
Huaneng Zhejiang Ruian Offshore Wind Power Co., Ltd.	PRC	Held indirectly	RMB10,000,000	Production and sale of electric power, and investment in wind power generation	100%	100%
Huaneng (Shanghai) Photovoltaic Power Co., Ltd.	PRC	Held directly	RMB35,496,600	Technical service of wind power generation	100%	100%
Sinosing Services PTE. Ltd.	Singapore	Held indirectly	USD1	Bond issuance service	100%	100%
Huaneng Yangqu Wind Power Co., Ltd.	PRC	Held indirectly	RMB47,000,000	Construction, operation and management of wind power projects	100%	100%
Huaneng Ruicheng Comprehensive Energy Co., Ltd.	PRC	Held indirectly	RMB216,300,000	Construction, operation and management of new energy power projects, and power generation	100%	100%
Huaneng Xiayi Wind Power Co., Ltd.	PRC	Held directly	RMB117,720,000	Production and sale of electric power, clean energy development and utilisation and investment in electricity projects	100%	100%
Huaneng (Anhui Shitai) Wind Power Co., Ltd.	PRC	Held directly	RMB63,600,000	Production and sale of electric power, clean energy development and utilisation and investment in electricity projects	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng (Tianjin) Energy Sales Co., Ltd.	PRC	Held directly	RMB200,000,000	Power and thermal energy supply, energy conservation technology service, transmission and substation projects contracting	100%	100%
Huaneng Qingneng Tongyu Power Co., Ltd.	PRC	Held indirectly	RMB180,000,000	Development and operation of new energy power projects	100%	100%
Huaneng Guanling New Energy Power Generation Co., Ltd.	PRC	Held directly	RMB100,000,000	Production and sale of electricity and heat	100%	100%
Huaneng Luobei Wind Power Co., Ltd.	PRC	Held indirectly	RMB467,148,000	Development and management of new energy technology, operation and management of wind power, and maintenance of wind power equipment	100%	100%
Huaneng Sihong New Energy Co., Ltd.	PRC	Held indirectly	RMB150,000,000	Development and management of new energy technology	100%	100%
Huaneng Taiqian Wind Power Co., Ltd.	PRC	Held directly	RMB101,136,800	Production and sale of electricity and heat, development, investment and management of new energy technology, and development and utilisation of clean energy	51%	51%
Huaneng Zhenping Clean Energy Co., Ltd.	PRC	Held directly	RMB80,000,000	Production and sale of electricity, and development and utilisation of clean energy	100%	100%
Huaneng (Heze Dongming) New Energy Co., Ltd.	PRC	Held directly	RMB208,726,700	Photovoltaic power generation, wind power generation and biomass power generation	100%	100%
Huaneng Jiangkou Wind Power Co., Ltd.	PRC	Held directly	RMB20,000,000	Production and sale of wind power, and development and utilisation of clean energy	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Chongqing Huaqing Energy Co., Ltd. (i)	PRC	Held indirectly	RMB44,420,000	Providing thermal energy and cold energy services; supplying electricity	45%	60%
Shengdong Rudong Offshore Wind Power Co., Ltd. (i)	PRC	Held indirectly	RMB2,000,000,000	Ancillary projects, construction of wind farm and wind farm maintenance	79%	100%
Huaneng Zhanhua Photovoltaic Power Generation Limited Company (i)	PRC	Held indirectly	RMB145,790,000	Photovoltaic power generation	46.40%	58%
Huaneng Dezhou New Energy Limited Company (i)	PRC	Held indirectly	RMB609,864,000	Photovoltaic power generation, wind power generation, and biomass power generation	80%	100%
Huaneng Jiyang Biomass Thermal Power Co., Ltd. (i)	PRC	Held indirectly	RMB72,190,000	Production and sale of new energy power	80%	100%
Huaneng (Liaocheng Gaotang) New Energy Co., Ltd. (i)	PRC	Held indirectly	RMB261,670,000	Development and operation of new energy power projects	80%	100%
Huaneng Yantai New Energy Co., Ltd. (i)	PRC	Held indirectly	RMB1,663,602,000	Biomass power generation, sale of electricity and heat, and energy-saving technology promotion	58.18%	72.73%
Huaneng Shanghai Shidongkou Power Generation Limited Liability Company ("Shidongkou Power") (ii)	PRC	Held directly	RMB1,179,000,000	Power generation	50%	100%
Huaneng Nanjing Combined Cycle Co-generation Co., Ltd. ("Nanjing Combined Cycle Co-generation") (iii)	PRC	Held indirectly	RMB938,350,000	Construction, operation and management of power plants and energy projects	57.39%	84.78%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Weishan New Energy Limited Company ("Weishan New Energy") (iv)	PRC	Held indirectly	RMB167,000,000	Investment, production and sale of new energy power generation projects	40%	100%
Huaneng Ruyi (Helan) New Energy Limited Company ("Helan New Energy") (iv)	PRC	Held indirectly	RMB19,000,000	Photovoltaic power generation	40%	100%
Huaneng Wulian New Energy Limited Company ("Wulian New Energy")(iv)	PRC	Held indirectly	RMB300,000,000	Photovoltaic power generation, wind power generation, and investment and development of new energy power projects	88.80%	100%
Huaneng Zhenlai Photovoltaic Power Generation Co., Ltd. ("Zhenlai Photovoltaic Power") (v)	PRC	Held indirectly	RMB29,958,660	Investment, construction, production, operation and overhaul of photovoltaic power generation projects	50%	100%
Huaneng Ruzhou Clean Energy Limited Liability Company	PRC	Held directly	RMB217,010,000	Production and supply of electricity projects, investment, construction and operation of electricity projects	100%	100%
Huaneng Sheyang New Energy Power Generation Co., Ltd. ("Sheyang New Energy") (xii)	PRC	Held indirectly	RMB1,136,500,000	Production and sale of electricity and heat	34%	70%
Huaneng (Jinxiang) New Energy Co., Ltd. (i)	PRC	Held indirectly	RMB80,000,000	Construction, operation and maintenance of new energy generation projects and distribution network projects; and production and sale of electricity	80%	100%
Huaneng Zuoquan Yangjiao Wind Power Co., Ltd.	PRC	Held indirectly	RMB500,000	Production and sale of electricity	100%	100%
Huaneng (Zhuanghe) Wind Power Co., Ltd.	PRC	Held indirectly	RMB2,700,000,000	Production and sale of electricity and heat	86.21%	86.21%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng (Zhuanghe) Clean Energy Co., Ltd.	PRC	Held indirectly	RMB1,500,000,000	Investment, construction and management of wind power projects	86.01%	86.01%
Huaneng Zaoyang New Energy Co., Ltd.	PRC	Held directly	RMB232,920,000	Production and sale of electricity, and development and utilisation of clean energy	100%	100%
Huaneng Zhenning New Energy Power Generation Co., Ltd.	PRC	Held directly	RMB222,470,000	Technological research and development and management of new energy projects, and sale of electricity	100%	100%
Huaneng Luodian New Energy Power Generation Co., Ltd.	PRC	Held directly	RMB155,190,000	Technological research and development and management of new energy projects, and sale of electricity	100%	100%
Huaneng Wangmo New Energy Power Generation Co., Ltd.	PRC	Held directly	RMB44,000,000	Technological research and development and management of new energy projects, and sale of electricity	100%	100%
Guizhou Huajin Clean Energy Co., Ltd.	PRC	Held indirectly	RMB200,000,000	Production and sale of electricity and heat, construction, operation and management of clean energy projects	51%	51%
Huaneng Daqing Clean Energy Co., Ltd.	PRC	Held indirectly	RMB1,000,000,000	Production and sale of electricity, construction, operation and management of clean energy projects	100%	100%
Huaneng Zhaodong Biomass Power Generation Co., Ltd.	PRC	Held indirectly	RMB120,000,000	Biomass power generation, sale of electricity and heat, and energy-saving technology promotion	60%	60%
Huaneng Siping Wind Power Co., Ltd.	PRC	Held indirectly	RMB407,810,000	Development and operation of new energy power projects	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Tongyu Tuanjie Wind Power Co., Ltd.	PRC	Held indirectly	RMB212,680,000	Development and operation of new energy power projects	100%	100%
Huaneng Henan Clean Energy Co., Ltd.	PRC	Held directly	RMB200,000,000	Production and sale of electricity, and construction, operation and management of clean energy projects	100%	100%
Huaneng Yingcheng New Energy Co., Ltd.	PRC	Held directly	RMB95,418,000	Production and sale of electricity, and construction, operation and management of clean energy projects	100%	100%
Huaneng (Fujian) Energy Development Co., Ltd.	PRC	Held directly	RMB4,214,710,512	Production and sale of electricity, and prevention of water pollution	100%	100%
Huaneng Power International Jiangsu Energy Development Co., Ltd. ("Jiangsu Energy Development")	PRC	Held directly	RMB15,089,400,000	Electricity, heat, and new energy development	100%	100%
Huaneng (Guangdong) Energy Development Co., Ltd.	PRC	Held directly	RMB6,536,297,868	Production and sale of heat, sewage treatment and recycling, and new energy technology development	100%	100%
Huaneng (Zhejiang) Energy Development Co., Ltd.	PRC	Held directly	RMB100,000,000	Production and sale of electricity and heat, sale of coal, lime, gypsum and related products, and research and development of energy-efficient technologies	100%	100%
Huaneng Nantong Combined Cycle Power Limited Company	PRC	Held indirectly	RMB960,000,000	Production and sale of electricity and heat; and investment in combined cycle co-generation industries	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Smart Energy (Jiaxiang) Co., Ltd. (i)	PRC	Held indirectly	RMB180,000,000	Production and sale of electricity and heat; and investment in combined cycle co-generation industries	80%	100%
Huaneng Yantai Bajiao Thermal Power Co., Ltd.* (i)	PRC	Held indirectly	RMB1,291,720,000	Production and sale of electricity and heat; and investment in combined cycle co-generation industries	80%	100%
Huaneng (Dashiqiao) Power New Energy Co., Ltd.*	PRC	Held indirectly	RMB500,000	Development and operation of new energy power projects	100%	100%
Huaneng (Haiyang) Guangfu New Energy Co., Ltd.* (i)	PRC	Held indirectly	RMB744,466,900	Production and sale of electricity, and development and utilisation of clean energy	64%	80%
Huaneng (Laizhou) New Energy Technology Co., Ltd.* (i)	PRC	Held indirectly	RMB210,000,000	Production and sale of electricity, and development and utilisation of clean energy	65.14%	81.43%
Huaneng (Liaocheng Guanxian) New Energy Development Limited Company* (i)	PRC	Held indirectly	RMB1,493,950,000	Production and sale of electricity, and development and utilisation of clean energy	52%	65%
Huaneng (Shantou Jinping) New Energy Co., Ltd.*	PRC	Held indirectly	RMB500,000	Production and sale of electricity, and development and utilisation of clean energy	100%	100%
Huaneng (Weifang Binhai District) New Energy Limited Company* (i)	PRC	Held indirectly	RMB404,650,000	Production and sale of electricity, and development and utilisation of clean energy	52%	65%
Huaneng (Yingkou) Electric Power New Energy Development Co., Ltd.*	PRC	Held indirectly	RMB500,000	Production and sale of new energy power	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng (Zhejiang Daishan) Offshore Wind Power Co., Ltd.* ("Daishan Wind Power") (xiii)	PRC	Held indirectly	RMB1,500,000,000	Production and sale of wind power, and development and utilisation of clean energy	40%	75%
Huaneng Beibu Gulf (Guangxi) New Energy Development Co., Ltd.*	PRC	Held directly	RMB100,000,000	Production and sale of new energy power	100%	100%
Huaneng Cixian Comprehensive Energy Co., Ltd.*	PRC	Held indirectly	RMB158,776,300	Production and sale of new energy power	100%	100%
Huaneng Daan Clean Energy Power Co., Ltd.* (i)	PRC	Held indirectly	RMB670,670,000	Production and sale of new energy power	80%	100%
Huaneng Daqing Ranghulu District Clean Energy Co., Ltd.*	PRC	Held indirectly	RMB300,000,000	Production and sale of electricity, construction, operation and management of clean energy projects	100%	100%
Huaneng Guangxi Clean Energy Co., Ltd.*	PRC	Held directly	RMB30,000,000	Production and sale of electricity	100%	100%
Huaneng Hebei Clean Energy Co., Ltd.*	PRC	Held directly	RMB3,000,000	Production and sale of electricity, construction, operation and management of clean energy projects	100%	100%
Huaneng Hubei New Energy Co., Ltd.*	PRC	Held directly	RMB164,920,000	Development and operation of new energy power projects	100%	100%
Huaneng Hualiangting (Tongling) Clean Energy Co., Ltd.*	PRC	Held indirectly	RMB72,000,000	Production and sale of electricity, construction, operation and management of clean energy projects	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Lindian Clean Energy Co., Ltd.*	PRC	Held indirectly	RMB100,000,000	Production and sale of electricity, construction, operation and management of clean energy projects	100%	100%
Huaneng Linxiang New Energy Co., Ltd.*	PRC	Held directly	RMB100,000	Development and operation of new energy power projects	100%	100%
Huaneng Pingshan Clean Energy Co., Ltd.*	PRC	Held indirectly	RMB500,000	Production and sale of electricity, construction, operation and management of clean energy projects	100%	100%
Huaneng Puyang Longyuan Clean Energy Co., Ltd.*	PRC	Held indirectly	RMB59,715,000	Development and operation of new energy power projects	51%	51%
Huaneng Clean Energy (Qujing Fuyuan) Co., Ltd.*	PRC	Held indirectly	RMB240,000,000	Production and sale of electricity, construction, operation and management of clean energy projects	75%	75%
Huaneng Clean Energy (Qujing Zhanyi) Co., Ltd.*	PRC	Held indirectly	RMB156,000,000	Production and sale of electricity, construction, operation and management of clean energy projects	75%	75%
Huaneng Tangshan Caofeidian District Clean Energy Co., Ltd.*	PRC	Held indirectly	RMB141,210,000	Production and sale of electricity, construction, operation and management of clean energy projects	70%	70%
Huaneng Xingtai Comprehensive Energy Co., Ltd.*	PRC	Held indirectly	RMB12,177,000	Development and operation of new energy power projects	100%	100%
Huaneng Chongqing Wushan Wind Power Co., Ltd.*	PRC	Held directly	RMB108,000,000	Production and sale of wind power, and development and utilisation of clean energy	75%	75%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(i) Subsidiaries acquired through establishment or investment *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Shangyi Guolang New Energy Co., Ltd.*	PRC	Held indirectly	RMB10,000,000	Production and sale of new energy power	100%	100%
Zhangjiakou Guolang New Energy Co., Ltd.*	PRC	Held directly	RMB141,000,000	Production and sale of new energy power	100%	100%
Shijiazhuang Yujun New Energy Technology Co., Ltd.* ("Yujun New Energy") (xv)	PRC	Held indirectly	RMB500,000	Development and operation of new energy power projects	40%	95%
Xinhe Hanhao New Energy Technology Co., Ltd.* ("Hanhao New Energy") (xv)	PRC	Held indirectly	RMB100,000	Development and operation of new energy power projects	40%	100%
Huaneng (Chaozhou Chaoan) New Energy Co., Ltd.*	PRC	Held indirectly	RMB500,000	Development and operation of new energy power projects	100%	100%
Huaneng (Pucheng) Clean Energy Co., Ltd.*	PRC	Held indirectly	RMB5,000,000	Production and sale of wind power, and development and utilisation of clean energy	100%	100%
Huaneng Shanxi Energy Service Co., Ltd.*	PRC	Held directly	RMB230,742,300	Production and sale of electricity	100%	100%
Hengshui Huaqing New Energy Technology Co., Ltd.* ("Huaqing New Energy") (xvi)	PRC	Held indirectly	RMB700,000	Development and operation of new energy power projects	40%	95%
Shenzhen Shunyi New Energy Technology Co., Ltd.* ("Shunyi New Energy") (xvi)	PRC	Held indirectly	RMB500,000	Development and operation of new energy power projects	40%	100%

* These companies were newly established in 2021.

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng (Suzhou Industrial Park) Power Generation Co., Ltd.	PRC	Held indirectly	RMB632,840,000	Power generation	75%	75%
Huaneng Qinbei Power Generation Co., Ltd. ("Qinbei Power")	PRC	Held directly	RMB3,139,965,055	Power generation	60%	60%
Huaneng Yushe Power Generation Co., Ltd.	PRC	Held directly	RMB615,760,000	Power generation, power distribution and sale of power	100%	100%
Huaneng Hunan Yueyang Power Generation Limited Liability Company	PRC	Held directly	RMB2,025,934,545	Power generation	55%	55%
Huaneng Chongqing Luohuang Power Generation Limited Liability Company ("Luohuang Power")	PRC	Held directly	RMB1,748,310,000	Power generation, production and sale of heat	60%	60%
Huaneng Pingliang Power Generation Co., Ltd.	PRC	Held directly	RMB924,050,000	Power generation	65%	65%
Huaneng Nanjing Jinling Power Generation Co., Ltd.	PRC	Held indirectly	RMB1,590,220,000	Power generation	60%	60%
Huaneng Qidong Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB391,738,500	Development of wind power projects, and production and sale of electricity	65%	65%
Tianjin Huaneng Yangliuqing Co-generation Limited Liability Company ("Yangliuqing Co-generation")	PRC	Held directly	RMB1,537,130,909	Power generation, heat supply, facilities installation, maintenance and related services	55%	55%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Wuhan Power Generation Co., Ltd. ("Wuhan Power")	PRC	Held directly	RMB1,478,461,500	Investment, construction, operation and management of electricity projects, and development and utilisation of clean energy resources	75%	75%
Huaneng Anyuan Power Generation Co., Ltd.	PRC	Held directly	RMB1,184,587,300	Construction and operation of power plants and related construction projects, and production of electricity	100%	100%
Huaneng Hualiangting Hydropower Co., Ltd.	PRC	Held directly	RMB50,000,000	Generation and transfer of power supply, and water supply (irrigation)	100%	100%
Huaneng Jingmen Thermal Power Co., Ltd.	PRC	Held directly	RMB780,000,000	Thermal power, power development and other service	100%	100%
Enshi Qingjiang Dalongtan Hydropwer Development Co., Ltd.	PRC	Held directly	RMB177,080,000	Hydropower development, production and management of electric power, and urban water supply	98.01%	98.01%
Huaneng Hainan Power Generation Limited Company	PRC	Held directly	RMB2,652,839,174	Investment, construction, operation of various power plants, and regular energy and new energy development	91.80%	91.80%
Huaneng Yingcheng Thermal Power Co., Ltd.	PRC	Held directly	RMB759,776,000	Construction and operation of power plants and production, sale of power and heat	100%	100%
Huaneng Heilongjiang Power Generation Limited Company	PRC	Held directly	RMB2,008,512,900	Development, investment construction, production and management of power (thermal) projects	100%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Hegang Power Generation Limited Company	PRC	Held indirectly	RMB1,092,550,000	Electricity power construction, energy conservation, development projects, and heat production and supply	64%	64%
Huaneng Xinhua Power Generation Limited Liability Company	PRC	Held indirectly	RMB284,880,000	Power generation, power equipment repair, and coal sale	70%	70%
Huaneng Tongjiang Wind Power Generation Limited Company	PRC	Held indirectly	RMB330,000,000	Wind power generation, wind power plants operation planning and design	82.85%	82.85%
Huaneng Daqing Thermal Power Limited Company	PRC	Held indirectly	RMB630,000,000	Power generation, and thermal production and supply	100%	100%
Daqing Lvyuan Wind Power Generation Limited Company	PRC	Held indirectly	RMB577,796,000	Wind power generation	100%	100%
Huaneng Yichun Thermal Power Limited Company ("Yichun Thermal Power")	PRC	Held indirectly	RMB581,000,000	Power construction, production and sale, and thermal production and sale	100%	100%
Huaneng Heilongjiang Energy Sales Limited Company	PRC	Held indirectly	RMB210,000,000	Power supply, and the production of heat and hot water	100%	100%
Zhaodong Huaneng Thermal Power Limited Company	PRC	Held indirectly	RMB10,000,000	Heat production and supply	100%	100%
Huaneng Jilin Power Generation Limited Company ("Jilin Power")	PRC	Held directly	RMB4,719,757,200	Power (thermal) projects, development of new energy projects and investment, construction, production, operation and sale	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Linjiang Jubao Hydropower Limited Company	PRC	Held indirectly	RMB46,820,000	Hydropower development and operation, and construction and operation of photovoltaic power generation	100%	100%
Huaneng Jilin Energy Sales Limited Company	PRC	Held indirectly	RMB210,000,000	Thermal (cold) production and supply, and power supply	100%	100%
Huaneng Shandong Power Generation Co., Ltd. ("Shandong Power")	PRC	Held directly	RMB4,241,460,000	Power (thermal) project development, investment, construction and management	80%	80%
Huaneng Henan Zhongyuan Gas Power Generation Co., Ltd.	PRC	Held directly	RMB400,000,000	Investment, construction, operation and management of power projects, thermal supply, and development and utilisation of clean energy resources	90%	90%
Huaneng Zibo Boshan Photovoltaic Power Limited Company (i)	PRC	Held indirectly	RMB22,000,000	Solar power generation, and sale	80%	100%
Huaneng Jining New Energy Limited Company (i)	PRC	Held indirectly	RMB38,000,000	Investment, construction and management of photovoltaic and wind power projects	80%	100%
Huaneng Rizhao Thermal Power Limited Company (i)	PRC	Held indirectly	RMB52,000,000	Urban heat construction, maintenance and operation, design and construction of heat engineering	80%	100%
Huaneng Laiwu New Energy Limited Company (i)	PRC	Held indirectly	RMB68,000,000	Photovoltaic power and wind power generation	80%	100%
Huaneng Shandong Sishui New Energy Limited Company (i)	PRC	Held indirectly	RMB143,090,000	Solar energy grid connected generation	80%	100%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Shandong Electric and Thermal Power Marketing Limited Company (i)	PRC	Held indirectly	RMB200,000,000	Sales and service of power and heating products, investment in power industry	80%	100%
Huaneng Shandong Information Technology Limited Company (i)	PRC	Held indirectly	RMB80,000,000	Information technology and management consulting services	80%	100%
Huaneng Zhanhua New Energy Limited Company (i)	PRC	Held indirectly	RMB235,298,200	Wind power, photovoltaic power generation	80%	100%
Huaneng Weihai Port Photovoltaic Power Generation Limited Company (i)	PRC	Held indirectly	RMB32,380,000	Photovoltaic power generation projects development and construction, electricity sales	80%	100%
Huaneng Jinan Huangtai Power Limited Company ("Huangtai Power") (i)	PRC	Held indirectly	RMB1,391,878,400	Electricity power production, heat management	72%	90%
Huaneng Dezhou Thermal Power Limited Company (i)	PRC	Held indirectly	RMB40,000,000	Urban heat construction, maintenance and operation, design and construction of heat engineering	68%	85%
Huaneng Dongying New Energy Limited Company (i)	PRC	Held indirectly	RMB92,601,483	Wind power projects development, wind power generation and sales of electricity	56%	70%
Huaneng Shandong (Hong Kong) Investment Limited Company ("Hong Kong Investment") (i)	Hong Kong	Held indirectly	10,000 shares	Investment	80%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Shandong Silk Road International Power Limited Company (i)	PRC	Held indirectly	RMB35,000,000	Contracting overseas projects and domestic international bidding projects, and construction and operation of power projects	80%	100%
Huaneng Jining Yunhe Power Generation Co., Ltd. ("Yunhe Power") (i)	PRC	Held indirectly	RMB696,355,300	Electrical (thermal) production and on-grid sale, technology consulting and services	78.68%	98.35%
Huaneng Linyi Power Generation Limited Company ("Linyi Power") (i)	PRC	Held indirectly	RMB1,093,313,400	Power generation	60%	75%
Liaocheng Changrun National Electric Heating Limited Company (i)	PRC	Held indirectly	RMB130,000,000	Heat supply	60%	75%
Linyi Lantian Thermal Power Limited Company (i)	PRC	Held indirectly	RMB36,000,000	Heat supply, maintenance of thermal power network, power sale, and installation and maintenance of distribution facilities	54.40%	68%
Yantai 500 Heating Limited Company (i)	PRC	Held indirectly	RMB20,500,000	Central heat services, plumbing and pipe installation services	64%	80%
Huaneng Shandong Taifeng Renewable Energy Co., Ltd.(i)	PRC	Held indirectly	RMB200,000,000	Investment, development, construction and management of photovoltaic power generation projects	65.78%	82.23%
Huaneng Laiwu Power Generation Limited Company (i)	PRC	Held indirectly	RMB2,340,000,000	Power production	74.32%	92.90%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Shandong Ruyi Coal Power Limited Company ("Ruyi Coal Power") (iv)	PRC	Held indirectly	RMB1,294,680,000	Development, investment, construction, operation and management of electricity power and coal	40%	100%
Huaneng Rongcheng New Energy Co., Ltd. (i)	PRC	Held indirectly	RMB36,540,000	Wind power generation	48%	60%
Huaneng Liaocheng Co-generation Limited Company ("Liaocheng Co-generation") (i)	PRC	Held indirectly	RMB1,038,407,950	Power and heat production and sale	60%	75%
Huaneng Jiaxiang Power Generation Limited Company ("Jiaxiang Power") (iv)	PRC	Held indirectly	RMB646,680,000	Power generation, electrical equipment maintenance	40%	100%
Huaneng Qufu Co-generation Limited Company ("Qufu Co-generation") (iv)	PRC	Held indirectly	RMB300,932,990	Sale and production of electric power, and thermal power	40%	100%
Huaneng Jining Hi-Tech Zone Co-generation Limited Company ("Jining Co-generation") (iv)	PRC	Held indirectly	RMB118,699,761	Heat supply and power generation	40%	100%
Huaneng Shandong Electric Power Fuel Limited Company ("Shandong Fuel Company") (iv)	PRC	Held indirectly	RMB100,000,000	Wholesale operation of coal	76.55%	100%
Huaneng Shandong Power Generation Maintenance Technology Limited Company ("Shandong Maintenance Company") (iv)	PRC	Held indirectly	RMB50,000,000	Power engineering design and construction	76.55%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(ii) Subsidiaries acquired from business combinations under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Shandong Rizhao Power Generation Limited Company ("Rizhao Power") (iv)	PRC	Held indirectly	RMB1,245,587,900	Heat and power business	88.80%	100%
Huaneng Beijing Co-generation Limited Liability Company ("Beijing Co-generation") (vi)	PRC	Held directly	RMB3,702,090,000	Construction and operation of power plants and related construction projects	41%	66%
Huaneng Chaohu Power Generation Co., Ltd. ("Chaohu Power") (vii)	PRC	Held directly	RMB840,000,000	Construction, operation, management of electricity projects, and development and utilisation of clean energy resources	60%	70%
Huaneng Suzhou Thermal Power Co., Ltd. ("Suzhou Thermal Power") (viii)	PRC	Held indirectly	RMB600,000,000	Construction, operation and management of electricity projects, and development and utilisation of clean energy	53.45%	100%
Huaneng Qinmei Ruijin Power Generation Co., Ltd. ("Qinmei Ruijin Power Generation") (x)	PRC	Held directly	RMB1,819,846,598	Construction, operation, management of electricity projects, and development and utilisation of clean energy	50%	100%
Tianjin Longye New Energy Co., Ltd.	PRC	Held directly	RMB9,300,000	Design, construction and maintenance of solar power projects, and sale of photovoltaic modules	100%	100%

The subsidiaries above and the Group are all controlled by Huaneng Group before and after the acquisitions.

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iii) Subsidiaries acquired from business combinations not under common control

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Huaneng Weihai Power Generation Limited Liability Company ("Weihai Power")	PRC	Held directly	RMB1,822,176,621	Power generation	60%	60%
Huaneng Huaiyin Power Generation Co., Ltd.	PRC	Held indirectly	RMB305,111,720	Power generation	100%	100%
Huade County Daditaihong Wind Power Utilisation Limited Liability Company	PRC	Held directly	RMB196,400,000	Wind power development and utilisation	100%	100%
Huaneng Zhanhua Co-generation Limited Company	PRC	Held directly	RMB190,000,000	Production and sale of electricity and thermal energy	100%	100%
Shandong Hualu Sea Transportation Limited Company	PRC	Held directly	RMB100,000,000	Cargo transportation along domestic coastal areas, and goods storage	74%	74%
Huaneng Qingdao Port Limited Company	PRC	Held directly	RMB219,845,009	Loading and conveying warehousing, conveying, water carriage materials supply	51%	51%
Huaneng Yunnan Diandong Energy Limited Liability Company	PRC	Held directly	RMB9,654,092,100	Electricity project investment, power generation and sale, and coal exploitation and investment	100%	100%
Yunnan Diandong Yuwang Energy Limited Company	PRC	Held directly	RMB6,796,510,000	Electricity project investment, power generation and sale, and coal exploitation and investment	100%	100%
Huaneng Luoyang Co-generation Limited Liability Company	PRC	Held directly	RMB600,000,000	Production and sale of electricity and heating	80%	80%
Huaneng Zhumadian Wind Power Generation Co., Ltd.	PRC	Held directly	RMB259,028,000	Wind power generation, and new energy development and utilisation	90%	90%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iii) Subsidiaries acquired from business combinations not under common control *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
SinoSing Power	Singapore	Held directly	US$1,476,420,585	Investment holding	100%	100%
Tuas Power	Singapore	Held indirectly	S$1,433,550,000	Investment holding	100%	100%
Tuas Power Supply Pte. Ltd.	Singapore	Held indirectly	S$500,000	Power sale	100%	100%
TP Asset Management Pte. Ltd.	Singapore	Held indirectly	S$2	Rendering of environment engineering services	100%	100%
TPGS Green Energy Pte. Ltd.	Singapore	Held indirectly	S$1,000,000	Provision of utility services	75%	75%
Ruzhou Wind Power Generation Co., Ltd.	PRC	Held indirectly	RMB133,800,000	Wind power and photovoltaic power generation	100%	100%
Hong Kong Energy (iv)	Hong Kong	Held indirectly	US$360,000,000	Investment	40%	100%
Huatai Power (iv)	Pakistan	Held indirectly	PKR1,000,000	Power generation operation and maintenance	40%	100%
Ruyi Pakistan Energy (iv)	Pakistan	Held indirectly	US$360,000,000	Electric power production and sale	40%	100%
Shanxi Xiaoyi Economic Development Zone Huaneng Energy Service Co., Ltd. ("Shanxi Xiaoyi Energy") (ix)	PRC	Held indirectly	RMB100,000,000	Electricity sale, and sale of raw coal and processed coal	51%	100%
Huaneng Shandong Power Design Co., Ltd.** ("Shandong Power Design") (iv)	PRC	Held indirectly	RMB3,000,000	Power engineering design, technology consulting and detection test	76.55%	100%
Chongqing Tuobo Water Affairs Co., Ltd.** (i)	PRC	Held indirectly	RMB10,000,000	Port management, port cargo handling and transportation	60%	100%

** These companies were newly acquired in 2021. The consideration of acquisition of these companies was zero, these business combinations were immaterial, both individually and in the aggregate, therefore, no further information was disclosed.

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Shangrao Hongyuan Power Co., Ltd	PRC	Held indirectly	RMB397,800,000	Construction, operation and management of photovoltaic power projects	100%	100%
Poyang Luohong Power Co., Ltd.	PRC	Held indirectly	RMB780,000,000	Investment, construction, operation and management of photovoltaic power projects	100%	100%
Shuozhou Taizhong Wind Power Limited Company	PRC	Held indirectly	RMB362,703,300	Investment, construction, operation and management of wind power projects	99.46%	99.46%
Wuzhai Taizhong New Energy Wind Power Limited Company	PRC	Held indirectly	RMB518,147,600	Investment, construction, operation and management of wind power projects	99.62%	99.62%
Xian Xvheng New Energy Limited Company	PRC	Held indirectly	RMB549,530,000	Construction, operation and management of photovoltaic power projects	100%	100%
Licheng Yingheng Clean Energy Limited Company	PRC	Held indirectly	RMB1,100,000,000	Construction, operation and management of photovoltaic power projects	100%	100%
Ruicheng Yaosheng Power Development Co., Ltd.	PRC	Held indirectly	RMB405,880,000	Development, construction, management and operation of solar power projects	100%	100%
Ruicheng Ningsheng New Energy Co., Ltd.	PRC	Held indirectly	RMB207,699,000	Development, construction, management and operation of solar power projects	100%	100%
Fanshi Nengyu Wind Power Co., Ltd.	PRC	Held indirectly	RMB512,123,000	Development, construction, management and operation of wind power projects, and wind power generation	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Dalian Chuanbo Haizhuang New Energy Co., Ltd. (i)	PRC	Held indirectly	RMB10,000,000	Development, construction, management and operation of wind power projects, wind power generation	86.01%	100%
Henan Juhe New Energy Technology Co., Ltd.	PRC	Held directly	RMB111,900,000	Technology promotion and application service industry	100%	100%
Xincai Juhe Wind Power Co., Ltd.	PRC	Held indirectly	RMB111,600,000	Development, construction, management and operation of wind power projects, and wind power generation	100%	100%
Nanchang Tongshang New Energy Co., Ltd.	PRC	Held indirectly	RMB110,000,000	New energy and energy-saving technology promotion, construction of solar and wind power projects, electronic product and mechanical equipment installation	100%	100%
Dashiqiao Baoneng Wind Power Generation Co., Ltd. ***	PRC	Held indirectly	RMB1,000,000	Development, construction, management and operation of wind power projects, and wind power generation and sale	100%	100%
Dashiqiao Hongjing Wind Power Generation Co., Ltd. ***	PRC	Held directly	RMB100,000	Development, construction, management and operation of wind power projects, and wind power generation and sale	100%	100%
Dashiqiao Guancheng New Energy Co., Ltd. ***	PRC	Held indirectly	RMB1,000,000	Development and operation of new energy power projects	80%	80%
Dashiqiao Xintai New Energy Co., Ltd. ***	PRC	Held indirectly	RMB10,000,000	Wind power generation, new energy technology promotion service	80%	80%

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Dandong Kangyi Power Co., Ltd. ***	PRC	Held indirectly	RMB1,000,000	Development and operation of new energy power projects	80%	80%
Hengfeng Jingluo Power Co., Ltd. ***	PRC	Held indirectly	RMB98,000,000	Development, construction, management and operation of solar power projects	100%	100%
Huaneng (Loudi) New Energy Co., Ltd. ***	PRC	Held directly	RMB1,000,000	Wind power generation, new energy technology promotion service	100%	100%
Huaneng Fengcheng New Energy Co., Ltd. ***	PRC	Held indirectly	RMB1,320,000,000	Wind power generation, new energy technology promotion service	70%	70%
Huanggang Huangmei Xiaochi Jingsheng Power Generation Co., Ltd. ***	PRC	Held indirectly	RMB164,920,000	Development and operation of new energy power projects	100%	100%
Huanggang Huangmei Xiaochi Yuyang New Energy Development Co., Ltd. ***	PRC	Held indirectly	RMB164,920,000	Development and operation of new energy power projects	100%	100%
Huanghua Yongyao New Energy Co., Ltd. ***	PRC	Held indirectly	RMB20,000,000	Development and operation of new energy power projects	100%	100%
Huanghua Younaite Guangmei New Energy Co., Ltd. ***	PRC	Held indirectly	RMB20,000,000	Development and operation of new energy power projects	100%	100%
Weixian Zeen Vegetable Planting Co., Ltd. ***	PRC	Held indirectly	RMB6,000,000	Vegetable planting and sale, agricultural marketing sales and development, construction, management and operation of solar power projects	100%	100%

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

Name of subsidiary	Country of incorporation	Type of interest held	Registered capital	Business nature and scope of operations	Percentage of equity interest held	
					Interest	Voting
Yingkou Changhao New Energy Co., Ltd. ***	PRC	Held indirectly	RMB1,000,000	New energy and energy-saving technology promotion, construction of solar and wind power projects, electronic product and mechanical equipment installation	80%	80%
Yingkou Shangdian New Energy Co., Ltd. ***	PRC	Held indirectly	RMB1,000,000	Electric power production and sale	100%	100%
Hangzhou Hengyang Power Co., Ltd. *** ("Hangzhou Hengyang") (xiv)	PRC	Held indirectly	RMB461,800,000	Development, construction, management and operation of solar power projects	49%	100%
Xishui Hengtai Power Co., Ltd. *** ("Hengtai Power") (xiv)	PRC	Held indirectly	RMB226,282,000	Development, construction, management and operation of solar power projects	49%	100%

*** These companies were newly acquired in 2021.

Notes:

(i) These companies are subsidiaries of the non-wholly owned subsidiaries controlled by the Company, so the voting right percentage of these companies are bigger than the interest percentage held by the Group.

(ii) According to its articles of association, the other shareholder who holds the remaining equity interests of Shidongkou Power entrusts the Group to exercise all its voting rights in relation to the operation and financial policies of Shidongkou Power. Accordingly, the Group has control over Shidongkou Power.

(iii) According to the voting in concert agreement entered into between the Group and another shareholder with 27.39% equity interests in Nanjing Combined Cycle Co-generation, the shareholder agreed to vote the same in respect of profit distribution decisions made by the Company. As a result, the Group has control over Nanjing Combined Cycle Co-generation.

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

Notes: *(Cont'd)*

(iv) These companies are subsidiaries of Shandong Power. The Company holds 80% interests in Shandong Power. Thus, the Group indirectly holds interests in these companies through their parent company.

According to the voting in concert agreement entered into among Shandong Power and another equity holder of Ruyi Coal Power, the other equity holder agreed to vote the same in respect of significant financial and operating decisions made by Shandong Power. As a result, the Company has control over Ruyi Coal Power.

Jiaxiang Power, Qufu Co-generation, Jining Co-generation, Weishan New Energy and Helan New Energy are wholly-owned subsidiaries of Ruyi Coal Power, a 50% owned subsidiary of Shandong Power. Therefore, the Group indirectly holds 40% interests in the above-mentioned five subsidiaries.

Shandong Power directly holds 72% interests in Shandong Fuel Company and Shandong Maintenance Company; meanwhile, Shandong Power indirectly holds a total of 23.68% equity interests and 28% voting rights in Shandong Fuel Company and Shandong Maintenance Company respectively through its own subsidiaries. Thus, the Company indirectly holds 76.55% interests and 100% voting rights in Shandong Maintenance Company, Shandong Fuel Company. Shandong Power Design is a wholly-owned subsidiary of Shandong Maintenance Company, so the Company indirectly holds 76.55% interests of Shandong Power Design.

The Company directly holds 44% equity interests in Rizhao Power and Shandong Power directly holds 56% interests in Rizhao Power. Thus, the Company holds 88.8% interests in Rizhao Power and its subsidiary, Wulian New Energy.

According to the voting in concert agreement entered into between Hong Kong Investment, who holds 50% equity interests of Hong Kong Energy, and the other shareholder of Hong Kong Energy, the other shareholder agreed to vote the same in respect of significant financial and operating decisions made by Hong Kong Investment. As a result, the Group has control over Hong Kong Energy and its subsidiaries including Huatai Power and Ruyi Pakistan Energy.

(v) According to the investment cooperation agreement and articles of association signed by Jilin Power and another shareholder of Zhenlai Photovoltaic Power, the shareholder enjoys fixed operating income and waives all management rights within a certain operating period. Therefore, the Group has control over Zhenlai Photovoltaic Power.

(vi) Pursuant to an agreement entered into between the Company and another shareholder of Beijing Co-generation, the Company is entrusted to vote the 25% voting rights held by the other shareholder as long as the Group remains as the largest shareholder of Beijing Co-generation. Thus, the Group has majority voting rights required by the articles of association to control the operation and financial policies of Beijing Co-generation. Accordingly, the Group has control over Beijing Co-generation.

(vii) According to the voting in concert agreement entered into between the Group and one shareholder with 10% equity interests in Chaohu Power, the shareholder agreed to vote the same in respect of significant financial and operating decisions made by the Group. As a result, the Group has control over Chaohu Power.

(viii) According to the voting in concert agreement entered into between the Group and the other two shareholders of Suzhou Thermal Power, the shareholders agreed to vote the same in respect of significant financial and operating decisions made by the Group. As a result, the Group has control over Suzhou Thermal Power.

(ix) In 2016, the Group accounted for the investment in Shanxi Xiaoyi Energy as a joint venture. On 15 February 2017, the Group entered into an agreement with the other shareholder with 49% equity interests in Shanxi Xiaoyi Energy who agreed to vote the same in respect of significant financial and operating decisions made by the Group. As a result, the Group has had control over Shanxi Xiaoyi Energy since February 2017.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

Notes: *(Cont'd)*

(x) In 2019, the Company's equity interest in Qinmei Ruijin Power Generation decreased from 100% to 50% due to capital injection from a third-party shareholder. On 28 December 2019, the Company entered into a voting in concert agreement with the other shareholder, and the other shareholder agreed to vote the same in respect of significant financial and operating decisions. As a result, the Company still has control over Qinmei Ruijin Power Generation.

(xi) According to the voting in concert agreement entered into between the Group and another shareholder with 49% equity interests in Jiyuan Energy Sales, the shareholder agreed to vote the same in respect of significant financial and operating decisions made by the Group. As a result, the Group has control over Jiyuan Energy Sales.

(xii) According to the articles of association signed by Jiangsu Energy Development, a wholly owned subsidiary of the Company, and other shareholders of Sheyang New Energy, Jiangsu Energy Development enjoys 70% voting rights. Therefore, the Group has control over Sheyang New Energy.

(xiii) According to the voting in concert agreement entered into between the Group and one shareholder with 35% equity interests in Daishan Wind Power, the shareholder agreed to vote the same in respect of significant financial and operating decisions made by the Group. As a result, the Group has control over Daishan Wind Power.

(xiv) According to the voting in concert agreement entered into between the Group and another shareholder with 51% equity interests in Hangzhou Hengyang, the shareholder agreed to vote the same in respect of significant financial and operating decisions made by the Group. As a result, the Group has control over Hangzhou Hengyang and its wholly-owned subsidiary Hengtai Power.

(xv) The investment purpose of the other shareholder of Yujun New Energy with 55% equity is strategic investment, not for the purpose of leading the daily business activities of Yujun New Energy. Accordingly, the Group controls business activities of Yujun New Energy through the voting rights of the shareholders' meeting and the board of directors regarding the relevant resolutions. As a result, the Group has control over Yujun New Energy and its wholly-owned subsidiary Hanhao New Energy.

(xvi) The investment purpose of the other shareholder of Huaqing New Energy with 55% equity strategic investment, not for the purpose of leading the daily business activities of Huaqing New Energy. Accordingly, the Group controls business activities of and Huaqing New Energy through the voting rights of the shareholders' meeting and the board of directors regarding the relevant resolutions. As a result, the Group has control over Huaqing New Energy and its wholly-owned subsidiary Shunyi New Energy.

10 OTHER EQUITY INSTRUMENT INVESTMENTS

	As at 31 December	
	2021	2020
Equity securities designated as at FVOCI (non-recycling)		
Listed equity investments at fair value	**6,865**	6,662
Unlisted equity investments at fair value		
7.89% of Ganlong Double–track Railway Co., Ltd.	**457,292**	504,309
Others	**264,913**	153,975
Subtotal	**722,205**	658,284
Total	**729,070**	664,946

The above equity investments were irrevocably designated as at fair value through other comprehensive income as the Group considers these investments to be strategic in nature.

11 POWER GENERATION LICENCE

The movements in the carrying amount of the power generation licence during the years are as follows:

	2021	2020
Beginning of the year	**3,954,983**	4,149,468
Movement:		
Currency translation differences	**(171,227)**	(194,485)
End of the year	**3,783,756**	3,954,983

The Group acquired the power generation licence in connection with the acquisition of Tuas Power. The power generation licence was initially recognised at fair value at the acquisition date. Tuas Power operates power plants in Singapore pursuant to the licence granted by the Energy Market Authority for a period of 30 years from 2003 until 2032. The licence was extended to 2044 during 2011 with minimal costs and is subject to further renewal. The Group expects that the applicable rules and regulations surrounding the renewal can be complied with based on the current market framework. The Group assessed the useful life of the power generation licence at 31 December 2021 to be indefinite and therefore the licence is not amortised.

Impairment test of the power generation licence

The power generation licence belongs to and has been assigned to Tuas Power, a CGU. There was no impairment provided for the power generation licence for the year ended 31 December 2021 (2020: Nil). For key assumptions used for value-in-use calculations, please refer to Note 14 for details.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

12 MINING RIGHTS

The movements in the carrying amount of mining rights during the years are as follows:

	2021	2020
Beginning of the year		
Cost	**2,506,867**	2,472,886
Accumulated impairment losses	**(895,381)**	(895,381)
Net book value	**1,611,486**	1,577,505
Movements:		
Addition	**–**	33,981
End of the year	**1,611,486**	1,611,486
Cost	**2,506,867**	2,506,867
Accumulated impairment losses	**(895,381)**	(895,381)
Net book value	**1,611,486**	1,611,486

In 2021, no impairment losses for mining rights (2020: Nil) have been recognised.

13 DERIVATIVE FINANCIAL INSTRUMENTS

Details of derivative financial instruments are as follows:

	As at 31 December	
	2021	2020
Derivative financial assets		
– Hedging instruments for cash flow hedge (fuel swap contracts)	**669,959**	184,458
– Hedging instruments for cash flow hedge (exchange forward contracts)	**52,252**	275
Total	**722,211**	184,733
Less: non-current portion		
– Hedging instruments for cash flow hedge (fuel swap contracts)	**20,516**	74,551
– Hedging instruments for cash flow hedge (exchange forward contracts)	**49,237**	3
Total non-current portion	**69,753**	74,554
Total current portion	**652,458**	110,179
Derivative financial liabilities		
– Hedging instruments for cash flow hedge (fuel swap contracts)	**16,328**	45,111
– Hedging instruments for cash flow hedge (exchange forward contracts)	**14,201**	68,853
– Hedging instruments for cash flow hedge (interest rate swap contracts)	**109,828**	181,037
Total	**140,357**	295,001
Less: non-current portion		
– Hedging instruments for cash flow hedge (fuel swap contracts)	**4,383**	10,358
– Hedging instruments for cash flow hedge (exchange forward contracts)	**1,777**	17,551
– Hedging instruments for cash flow hedge (interest rate swap contracts)	**93,163**	160,230
Total non-current portion	**99,323**	188,139
Total current portion	**41,034**	106,862

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

13 DERIVATIVE FINANCIAL INSTRUMENTS *(Cont'd)*

For the years ended 31 December 2021 and 2020, no material ineffective portion arising from cash flow hedges was recognised in profit or loss.

TPG uses foreign currency forward contracts which are designated as hedging instruments in cash flow hedges of purchase in USD. It also uses fuel oil swap contracts to hedge its fuel price risk arising from highly probable forecast purchases of fuel purchases.

TPG uses various interest rate swap contracts to hedge floating semi-annual interest payments on borrowings with maturity dates up to 2021. TPSTMWR also uses various interest rate swap contracts to hedge floating quarterly interest payments on borrowings with maturity dates up to 2044. The notional principal amount of these outstanding interest rate swap contracts at 31 December 2021 was S$139 million (RMB equivalent of RMB658 million) (2020: S$142 million (RMB equivalent of RMB700 million)). Through these arrangements, TPG and TPSTMER swapped original floating interest (6-month SOR and 3-month SOR) to annual fixed interest determined by individual swap contracts. These interest rate swap contracts are settled quarterly from September 2018 to June 2044. As at 31 December 2021, the remaining interest rate swap contracts were carried on the consolidated statement of financial position as financial liabilities of RMB110 million (2020: financial liabilities of RMB181 million).

There is an economic relationship between the hedged items and the hedging instruments as the terms of the exchange forward contracts, fuel swap contracts and interest rate swap contracts match the terms of the expected highly probable forecast transactions and borrowings (i.e., notional amount and expected payment date). The Group has established a hedge ratio of 1:1 for the hedging relationships as the underlying risk of the exchange forward, fuel swaps and interest rate swaps are identical to the hedged risk components. To test the hedge effectiveness, the Group uses the hypothetical derivative method and compares the changes in the fair value of the hedging instruments against the changes in fair value of the hedged items attributable to the hedged risks.

The hedge ineffectiveness can arise from:

(a) Differences in the timing of the cash flows of the hedged items and the hedging instruments.

(b) Different indexes (and accordingly different curves) linked to the hedged risk of the hedged items and hedging instruments.

(c) The counterparties' credit risk differently impacting the fair value movements of the hedging instruments and hedged items.

(d) Changes to the forecasted amount of cash flows of hedged items and hedging instruments.

13 DERIVATIVE FINANCIAL INSTRUMENTS *(Cont'd)*

The analysis of contractual cash inflows/(outflows) of major derivative financial instruments is as follows:

		Maturity			
	Carrying amounts	Contractual cash flows	Within 1 year	Between 1 and 5 years	After 5 years
As at 31 December 2021					
Derivative financial assets					
Fuel derivatives used for hedging (net settlement)	669,959	669,959	649,443	20,516	–
Forward exchange contracts used for hedging					
– inflows		4,747,875	634,806	4,113,069	–
– outflows		(4,665,114)	(632,358)	(4,032,756)	–
	52,252	82,761	2,448	80,313	–
Derivative financial liabilities					
Fuel derivatives used for hedging (net settlement)	(16,328)	(16,328)	(11,945)	(4,383)	–
Forward exchange contracts used for hedging					
– inflows		1,521,083	1,198,204	322,879	–
– outflows		(1,536,817)	(1,212,445)	(324,372)	–
	(14,201)	(15,734)	(14,241)	(1,493)	–
Net-settled interest rate swaps used for hedging					
– net cash outflows	(109,828)	(150,323)	(32,683)	(36,821)	(80,819)

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

13 DERIVATIVE FINANCIAL INSTRUMENTS *(Cont'd)*

		Maturity			
	Carrying amounts	Contractual cash flows	Within 1 year	Between 1 and 5 years	After 5 years
As at 31 December 2020					
Derivative financial assets					
Fuel derivatives used for hedging (net settlement)	184,458	184,458	109,907	74,551	–
Forward exchange contracts used for hedging					
– inflows		304,090	302,424	1,666	–
– outflows		(303,780)	(302,120)	(1,660)	–
	275	310	304	6	–
Derivative financial liabilities					
Fuel derivatives used for hedging (net settlement)	(45,111)	(45,111)	(34,753)	(10,358)	–
Forward exchange contracts used for hedging					
– inflows		1,918,752	1,498,700	420,052	–
– outflows		(1,986,755)	(1,549,515)	(437,240)	–
	(68,853)	(68,003)	(50,815)	(17,188)	–
Net-settled interest rate swaps used for hedging					
– net cash outflows	(181,037)	(230,534)	(37,564)	(69,890)	(123,080)

14 GOODWILL

The movements of goodwill during the years are as follows:

	2021	2020
Beginning of the year		
Cost	**18,765,535**	19,292,497
Accumulated impairment losses	**(4,027,519)**	(3,357,542)
Net book value	**14,738,016**	15,934,955
Movements:		
Business combination	**–**	12,615
Impairment charge for the year	**–**	(685,036)
Currency translation differences – cost	**(475,051)**	(539,577)
Currency translation differences – impairment	**13,259**	15,059
End of the year	**14,276,224**	14,738,016
Cost	**18,290,484**	18,765,535
Accumulated impairment losses	**(4,014,260)**	(4,027,519)
Net book value	**14,276,224**	14,738,016

Impairment tests for goodwill

In the impairment assessment of the Group, goodwill is allocated to a CGU or CGUs that are expected to benefit from the synergies of the business combination and is allocated to the relevant CGUs based on operating areas. The CGUs are consistent with those used on the purchase dates and in the impairment tests in previous years. The carrying amounts of the major goodwill allocated to individual CGUs are as follows:

	2021	2020
PRC power segment:		
Yunhe Power	**295,001**	295,001
Linyi Power	**382,500**	382,500
Wuhan Power	**518,484**	518,484
Liaocheng Co-generation	**429,750**	429,750
Overseas segment:		
Tuas Power	**10,204,634**	10,666,426

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

14 GOODWILL *(Cont'd)*

Impairment tests for goodwill *(Cont'd)*

The recoverable amount of a CGU is determined based on value-in-use calculations. The cash flow projections of CGUs are based on management's forecasted cash flows in the next five years. Based on existing production capacity, the domestic subsidiaries of the Company expect cash flows beyond such periods will be similar to that in the 5th year and thus a zero terminal growth rate is utilised in the forecasts. For Tuas Power, cash flows beyond the 5th year is extrapolated using a terminal growth rate of 2.0%, which is not greater than the forecasted growth rate as stipulated in the relevant report issued by the Energy Market Authority of Singapore ("EMA").

Pre-tax discount rates used for value-in-use calculations:

	2021	2020
Yunhe Power	**7.78%**	8.98%
Linyi Power	**7.89%**	9.00%
Wuhan Power	**8.95%**	8.94%
Liaocheng Co-generation	**7.90%**	8.90%
Tuas Power	**8.55%**	8.40%

Key assumptions used for value-in-use calculations:

For goodwill of domestic CGUs, the key assumptions applied in the impairment tests include the expected future sales volumes (power generation hours), fuel prices and discount rate. Management determined these assumptions based on past performance and its expectations on market development. The discount rates used reflect specific risks relating to individual CGUs. Based on the impairment assessment, no impairment was recognised in 2021 (2020: Yuhe Power, Linyi Power, Liaocheng Co-generation, Huaneng Shandong Power Generation Co., Ltd. Yantai Power Plant ("Yantai Power Plant") and Yichun Thermal Power recognised RMB405 million, RMB159 million, RMB66 million, RMB31 million and RMB24 million, of impairment losses of goodwill respectively).

For the goodwill allocated to Tuas Power, the key assumptions applied in the impairment model include the expected future sales volume, gross margin, terminal growth rate and discount rate. Management determined these key assumptions based on past performance and its expectations on market development.

14 GOODWILL *(Cont'd)*

Impairment tests for goodwill *(Cont'd)*

Key assumptions used for value–in–use calculations *(Cont'd)*:

The EMA released its Singapore Electricity Market Outlook ("SEMO 2021") on 10 November 2021, stating that the annual system demand and system peak demand are projected to grow at a CAGR of between 2.80% and 3.2% over the next 10 years, from 2022 to 2032, taking into account various factors including demographic, climate and economic impacts as well as projected demand from new high-growth sectors such as data centres. According to SEMO 2021 report, the compound annual growth rate of the electricity market from 2009 to 2020 was about 2.2%. The market share of Singapore Tuas Power in Singapore has remained stable, with the market share ratios being 20.7%, 21.4% and 19.2% in 2019, 2020 and 2021, respectively. The sales volumes of Singapore Tuas Power from 2021 to 2025 are forecasted based on its past performance, and a terminal growth rate of 2% (2020: 2%) is utilised in the forecast.

Management used the after-tax discount rate for the power generation industry for 2021 and 2022 published by the EMA in November 2020 to calculate the pre-tax discount rate used for value-in-use calculations of Tuas Power, which is 8.55% for the year ended 31 December 2021 (2020: 8.40%).

According to the impairment assessment, there was no impairment provided for the goodwill of Tuas Power for the year ended 31 December 2021 (2020: Nil). In 2021 and 2020, the fluctuation of goodwill in respect of Tuas Power was due to currency translation differences.

For the goodwill allocated to the CGU in Singapore, management has assessed that one of the most sensitive key assumptions is the pre-tax discount rate which was arrived at based on weighted average cost of capital. An absolute increase in the pre-tax discount rate of 0.5% (31 December 2020: 0.5%) would result in a decrease of approximately RMB1,857 million (31 December 2020: RMB1,691 million) in the recoverable amount of the CGU.

For the goodwill allocated to CGUs in the PRC, management has assessed that two of the most sensitive key assumptions are future sales volume and fuel price. If future sales volume had decreased by 1% or 5% from management's estimates, while other variables stay constant with the expectations, the Group would have to recognise impairment against goodwill by approximately RMB103 million and RMB1,231 million (31 December 2020: RMB279 million and RMB1,723 million), respectively. If fuel price had increased by 1% or 5% from management's estimates, while other variables stay constant with the expectations, the Group would have to recognise impairment against goodwill by approximately RMB264 million and RMB2,075 million (31 December 2020: RMB488 million and RMB2,588 million), respectively.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

15 OTHER NON-CURRENT ASSETS

Details of other non-current assets are as follows:

	As at 31 December	
	2021	2020
Finance lease receivables (i) (note 41)	**8,664,550**	9,431,733
VAT recoverable	**6,213,495**	5,526,256
Prepayments for pre-construction cost	**479,138**	438,167
Intangible assets (ii)	**632,639**	643,486
Prepaid connection fees	**28,598**	33,041
Contract assets	**837,559**	736,568
Others(iii)	**2,200,026**	1,728,332
Total	**19,056,005**	18,537,583

Notes:

(i) Ruyi Pakistan Energy entered into a power purchase agreement with CPPA-G to sell all of the electricity produced with a regulated tariff mechanism approved by the National Electric Power Regulatory Authority. In accordance with the power purchase agreement and tariff mechanism, almost all the risks and rewards in relation to the power assets were in substance transferred to CPPA-G and therefore were accounted for as a finance lease to CPPA-G. Please refer to Note 41 for other details of finance lease receivables.

(ii) The intangible assets primarily consist of software, patented technologies, etc. In 2021, there was no impairment provided for the intangible assets (2020: Nil).

(iii) Included in others, there was an asset amounting to RMB110 million as at 31 December 2021 (31 December 2020: RMB110 million) which related to the acquisition of Huangtai #8 Power Plant. As at 31 December 2021, the Group recognised the impairment on afore-mentioned asset amounting to RMB110 million (31 December 2020: RMB55 million).

Included in others, there was an asset amounting to RMB485 million as at 31 December 2021 (31 December 2020: RMB485 million) which related to the funding receivables to Huangtai #8 Power Plant. As at 31 December 2021, the Group recognised the impairment on afore-mentioned asset amounting to RMB110 million (31 December 2020: nil).

According to the property right transfer agreement signed in December 2008 between Shandong Power and Shandong Luneng Development Group ("Shandong Luneng") and the corresponding approval from the State-owned Assets Supervision and Administration Commission of the State Council in February 2009 ("State-owned Assets Right [2009] No.70"), Shandong Power acquired 30% of property right of Huangtai #8 Power Plant from Shandong Luneng at a cash consideration of RMB110 million. Huangtai #8 Power Plant is not a legal entity under PRC Company Law, though it has separate accounting books, and therefore the Group recognised the 30% property right as other non-current assets. Huangtai Power is in charge of daily operations of Huangtai #8 Power Plant on behalf of two property owners.

16 INVENTORIES

Inventories comprised:

	As at 31 December	
	2021	2020
Fuel for power generation	**15,598,354**	5,327,750
Material and supplies	**1,395,459**	1,473,355
	16,993,813	6,801,105
Less: provision for inventory obsolescence	**169,382**	198,646
Total	**16,824,431**	6,602,459

Movements of provision for inventory obsolescence during the years are analysed as follows:

	2021	2020
Beginning of the year	**(198,646)**	(187,427)
Provision	**(1,583)**	(43,993)
Reversal	**1,825**	917
Write-off*	**23,365**	25,378
Currency translation differences	**5,657**	6,479
End of the year	**(169,382)**	(198,646)

* In 2021, approximately RMB23 million provision was written-off for the material and supplies which was provided for inventory provision in former years.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

17 OTHER RECEIVABLES AND ASSETS

Other receivables and assets comprised the following:

	As at 31 December	
	2021	2020
Prepayments for inventories	4,002,491	1,222,785
Prepaid income tax	695,156	133,090
Others	436,411	335,189
Subtotal of prepayments	5,134,058	1,691,064
Less: Loss allowance	2,638	2,638
Total prepayments, net	5,131,420	1,688,426
Dividends receivable	206,539	50,000
Receivables from sales of fuel	179,712	249,852
Others (Note i)	3,362,070	2,222,593
Subtotal of other receivables	3,748,321	2,522,445
Less: Loss allowance	220,826	187,675
Total other receivables, net	3,527,495	2,334,770
VAT recoverable	5,109,848	2,428,315
Finance lease receivables (Note 41)	550,594	478,666
Designated loan to joint ventures	75,100	304,306
Others	369,090	138,209
Subtotal other assets	6,104,632	3,349,496
Less: Loss allowance	64,615	64,615
Total other assets, net	6,040,017	3,284,881
Gross total	14,987,011	7,563,005
Net total	14,698,932	7,308,077

Note i: Included in others, there were advances amounting to RMB462 million as at 31 December 2021 (31 December 2020: RMB222 million) which were due from Huangtai #8 Power Plant with indefinite repayment terms. For the year ended 31 December 2021, Huangtai Power, a subsidiary of the Company, paid total advances amounting to RMB240 million on behalf of Huangtai #8 Power Plant (for the year ended 31 December 2020: received total repayments amounting to RMB10 million).

17 OTHER RECEIVABLES AND ASSETS *(Cont'd)*

Please refer to Note 36 for details of other receivables and assets due from the related parties. The Group does not hold any collateral or other credit enhancements over its other receivables. The other receivables are non-interest-bearing.

The gross amounts of other receivables are denominated in the following currencies:

	As at 31 December	
	2021	2020
RMB	**2,832,004**	1,945,945
S$ (RMB equivalent)	**352,138**	102,484
US$ (RMB equivalent)	**39,495**	16,585
PKR (RMB equivalent)	**524,684**	457,431
Total	**3,748,321**	2,522,445

Movements of provision for loss allowance during the years are analysed as follows:

	2021	2020
Beginning of the year	**(254,928)**	(55,169)
Provision	**(55,217)**	(148,976)
Reversal	**189**	18
Write-off	**3,101**	3,559
Others	**–**	(62,772)
Currency translation differences	**18,776**	8,412
End of the year	**(288,079)**	(254,928)

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

18 ACCOUNTS AND NOTES RECEIVABLE

Accounts and notes receivable comprised the following:

	As at 31 December	
	2021	2020
Accounts receivable	**40,274,603**	30,045,678
Notes receivable	**3,743,482**	8,325,966
	44,018,085	38,371,644
Less: Loss allowance	**140,088**	155,929
Total	**43,877,997**	38,215,715
Analysed into:		
Accounts receivable		
– At amortised cost	**39,996,822**	28,789,790
– At fair value through other comprehensive income	**277,781**	1,255,888
Notes receivable		
– At amortised cost	**3,743,482**	8,325,966

In November 2020, the Group's subsidiary, Shandong Power, entered into two agreements of single assets management plans (the "Assets Management Plans") with Yingda Securities Co., Ltd. Under the Assets Management Plans, the Group is not exposed to default risks of the accounts receivable after the transfer. Subsequent to the transfer, the Group did not retain any rights on the use of the accounts receivable, including the sale, transfer or pledge of the accounts receivable to any other third parties. As at 31 December 2021, one of the Assets Management Plans expired. The original carrying value in aggregate of the accounts receivable transferred and derecognised under the arrangement that have not been settled as at 31 December 2021 was RMB220 million (2020: RMB1,220 million).

During the year ended 31 December 2021, the Group recognised RMB14.86 million of loss on the date of transfer of the accounts receivable (2020: RMB41.48 million).

18 ACCOUNTS AND NOTES RECEIVABLE *(Cont'd)*

The gross amounts of accounts receivable and notes receivable are denominated in the following currencies:

	As at 31 December	
	2021	2020
RMB	**39,818,368**	35,113,954
S$ (RMB equivalent)	**1,177,499**	996,686
US$ (RMB equivalent)	**85,595**	21,640
PKR (RMB equivalent)	**2,936,623**	2,239,364
Total	**44,018,085**	38,371,644

The Group usually grants credit periods of about one month to domestic local power grid customers from the end of the month in which the sales are made. SinoSing Power provides credit periods that range from 5 to 60 days from the dates of billing. Certain accounts receivable of Singapore subsidiaries are backed by bankers' guarantees and/or deposits from customers. It is not practicable to determine the fair value of the collateral that corresponds to these accounts receivable. Due to the cash flow difficulties caused by COVID-19, the credit period of accounts receivable from CPPA-G by Ruyi Pakistan Energy increased from one month to five months.

As at 31 December 2021, no accounts receivable were pledged to banks as collateral for loans (2020: Nil).

The Group, except for Singapore subsidiaries, does not hold any collateral or other credit enhancements over its accounts receivable. The accounts receivable are non-interest-bearing.

For the collateral of notes receivable, please refer to Note 27 for details.

Movements of provision for loss allowance during the years are analysed as follows:

	2021	2020
Beginning of the year	**(155,929)**	(195,320)
Provision	**(22,096)**	(24,105)
Reversal	**36,586**	441
Write-off	**925**	20
Others	**–**	62,772
Currency translation differences	**426**	263
End of the year	**(140,088)**	(155,929)

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

18 ACCOUNTS AND NOTES RECEIVABLE *(Cont'd)*

An ageing analysis of accounts and notes receivable based on the invoice date was as follows:

	As at 31 December	
	2021	2020
Within 1 year	**43,683,311**	37,966,985
Between 1 and 2 years	**114,471**	174,604
Between 2 and 3 years	**59,241**	86,388
Over 3 years	**161,062**	143,667
Total	**44,018,085**	38,371,644

As at 31 December 2021, the maturity period of the notes receivable ranged from 1 to 12 months (2020: from 1 to 12 months).

19 COMPANY'S STATEMENT OF CHANGES IN EQUITY

			Capital surplus								
	Share capital	Other equity instruments	Share premium	Hedging reserve	Fair value reserve (non-recycling)	Other reserve in other comprehensive income	Other capital reserve	Subtotal	Surplus reserves	Retained earnings	Total equity
Balance as at 31 December 2020	15,698,093	48,419,779	24,987,019	–	(289,360)	–	1,093,892	25,791,551	8,140,030	32,088,513	130,137,966
Profit/(Loss) for the year ended 31 December 2021	–	2,137,420	–	–	–	–	–	–	–	(5,959,494)	(3,822,074)
Other comprehensive loss:											
Fair value changes of other equity investment instruments, net of tax	–	–	–	–	(35,262)	–	–	(35,262)	–	–	(35,262)
Total comprehensive income/(loss) for the year ended 31 December 2021	–	2,137,420	–	–	(35,262)	–	–	(35,262)	–	(5,959,494)	(3,857,336)
Cumulative distribution of other equity instruments (Note 21)	–	(2,139,222)	–	–	–	–	–	–	–	–	(2,139,222)
2020 Dividends (Note 23)	–	–	–	–	–	–	–	–	–	(2,825,657)	(2,825,657)
Others	–	–	–	–	–	–	–	–	–	2,255	2,255
Balance as at 31 December 2021	15,698,093	48,417,977	24,987,019	–	(324,622)	–	1,093,892	25,756,289	8,140,030	23,305,617	121,318,006

19 COMPANY'S STATEMENT OF CHANGES IN EQUITY *(Cont'd)*

			Capital surplus								
	Share capital	Other equity instruments	Share premium	Hedging reserve	Fair value reserve (non-recycling)	Other reserve in other comprehensive income	Other capital reserve	Subtotal	Surplus reserves	Retained earnings	Total equity
Balance as at 31 December 2019	15,698,093	25,127,821	24,987,019	–	(158,668)	–	1,093,892	25,922,243	8,140,030	36,829,957	111,718,144
Profit/(Loss) for the year ended 31 December 2020	–	1,770,469	–	–	–	–	–	–	–	(2,622,045)	(851,576)
Other comprehensive loss:											
Fair value changes of other equity investment instruments, net of tax	–	–	–	–	(130,692)	–	–	(130,692)	–	–	(130,692)
Total comprehensive income/(loss) for the year ended 31 December 2020	–	1,770,469	–	–	(130,692)	–	–	(130,692)	–	(2,622,045)	(982,268)
Issue of other equity instruments	–	25,457,450	–	–	–	–	–	–	–	–	25,457,450
Redemption of other equity instruments	–	(2,499,844)	–	–	–	–	–	–	–	(156)	(2,500,000)
Cumulative distribution of other equity instruments	–	(1,436,117)	–	–	–	–	–	–	–	–	(1,436,117)
2019 dividends (Note 23)	–	–	–	–	–	–	–	–	–	(2,119,243)	(2,119,243)
Balance as at 31 December 2020	15,698,093	48,419,779	24,987,019	–	(289,360)	–	1,093,892	25,791,551	8,140,030	32,088,513	130,137,966

20 SHARE CAPITAL

	2021 Number of shares	2021 Share capital RMB '000	2020 Number of shares	2020 Share capital RMB '000
As at 1 January				
A shares	**10,997,709,919**	**10,997,710**	10,997,709,919	10,997,710
Overseas listed foreign shares	**4,700,383,440**	**4,700,383**	4,700,383,440	4,700,383
Subtotal	**15,698,093,359**	**15,698,093**	15,698,093,359	15,698,093
Issuance of new shares	**–**	**–**	–	–
As at 31 December				
A shares	**10,997,709,919**	**10,997,710**	10,997,709,919	10,997,710
Overseas listed foreign shares	**4,700,383,440**	**4,700,383**	4,700,383,440	4,700,383
Total	**15,698,093,359**	**15,698,093**	15,698,093,359	15,698,093

21 OTHER EQUITY INSTRUMENTS

(a) Other equity instruments as at 31 December 2021

Type of instruments	Issuance Date	Category	Initial Distribution Rate	Issue Price RMB'000	Number	Par Value RMB'000	Initial Period	Conversion Condition	Conversion Result
Bond B	September 2017	Equity Instrument	5.17%	0.1	25,000,000	2,500,000	5 years	None	None
Yingda Insurance Financing Plan (1st)	September 2018	Equity Instrument	5.79%	–	–	3,283,000	8 years	None	None
Yingda Insurance Financing Plan (2nd)	September 2018	Equity Instrument	5.79%	–	–	827,000	8 years	None	None
Yingda Insurance Financing Plan (3rd)	September 2018	Equity Instrument	5.79%	–	–	890,000	8 years	None	None
China Life Financing Plan (1st)	September 2019	Equity Instrument	5.05%	–	–	2,070,000	8 years	None	None
PICC Financing Plan (1st)	September 2019	Equity Instrument	5.10%	–	–	930,000	10 years	None	None
2019 medium-term notes (2nd)	October 2019	Equity Instrument	4.08%	0.1	20,000,000	2,000,000	3 years	None	None
2019 medium-term notes(3rd)	October 2019	Equity Instrument	4.05%	0.1	20,000,000	2,000,000	3 years	None	None
China Life Financing Plan (2nd)	October 2019	Equity Instrument	5.05%	–	–	2,260,000	8 years	None	None
PICC Financing Plan (2nd)	October 2019	Equity Instrument	5.10%	–	–	1,740,000	10 years	None	None
2019 medium-term notes (4th)	November 2019	Equity Instrument	4.15%	0.1	25,000,000	2,500,000	3 years	None	None
2019 medium-term notes (4th)	November 2019	Equity Instrument	4.53%	0.1	15,000,000	1,500,000	5 years	None	None
Bond C	March 2020	Equity Instrument	3.58%	0.1	20,000,000	2,000,000	3 years	None	None
Bond D	March 2020	Equity Instrument	3.85%	0.1	10,000,000	1,000,000	5 years	None	None
2020 medium-term notes (1st)	April 2020	Equity Instrument	3.18%	0.1	30,000,000	3,000,000	3 years	None	None
China Life Financing Plan (3rd)	April 2020	Equity Instrument	4.75%	–	–	3,570,000	8 years	None	None
PICC Financing Plan (3rd)	April 2020	Equity Instrument	4.75%	–	–	930,000	10 years	None	None
Bond E	April 2020	Equity Instrument	3.09%	0.1	25,000,000	2,500,000	3 years	None	None
2020 medium-term notes (2nd)	June 2020	Equity Instrument	3.60%	0.1	35,000,000	3,500,000	3 years	None	None
2020 medium-term notes (3rd)	August 2020	Equity Instrument	3.99%	0.1	20,000,000	2,000,000	3 years	None	None
PICC Financing Plan (4th)	August 2020	Equity Instrument	4.60%	–	–	3,000,000	10 years	None	None
Bond F	September 2020	Equity Instrument	4.38%	0.1	30,000,000	3,000,000	3 years	None	None
2020 medium-term notes (4th)	September 2020	Equity Instrument	4.40%	0.1	10,000,000	1,000,000	3 years	None	None
Total						48,000,000			

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major provisions

In 2017, the Company issued two tranches of perpetual corporate bonds with net proceeds of approximately RMB2,500 million and RMB2,500 million, respectively. The perpetual corporate bonds are issued at par value with initial distribution rates of 5.05% and 5.17%. The interest of the perpetual corporate bonds is recorded as distributions, which are paid annually in arrears in September in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (e.g. distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The perpetual corporate bonds have no fixed maturity date and are callable at the Company's discretion in whole in August 2020 and 2022 respectively, and the payment of the principal may be deferred for each renewal period to 3 and 5 years respectively. The applicable distribution rate will be reset on the first call date and in each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum. On the first call date of bond A in September 2020, the Company decided to exercise the callable option. The bond was redeemed in whole on 25 September 2020.

In 2018, the Company issued three tranches of Yingda Insurance Financing Plan (the "Yingda plan") with aggregate proceeds of RMB5,000 million. The Yingda plan has no fixed period with an initial distribution rate of 5.79%. The interest of the financing plan is recorded as distributions, which are paid annually in arrears in June and December in each year and may be deferred at the discretion of the Company unless compulsory payment events (e.g. distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The Yingda plan has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 8th year of issuance, or the payment of the principal may be deferred at each distribution date mentioned above. The applicable distribution rate will be reset during the period from the 9th to the 11th years after the issuance, the period from the 11th to the 13th years after the issuance and the 13th year onwards after the issuance, to the higher of the initial distribution rate plus 300 basis points and the 10-year treasury bond yield in the 9th year after the issuance plus 600 basis points, the higher of the initial distribution rate plus 600 basis points and the 10-year treasury bond yield in the 11th year after the issuance plus 900 basis points and the higher of the initial distribution rate plus 900 basis points and the 10-year treasury bond yield in the 13th year after the issuance plus 1,200 basis points, respectively. As at 24 November 2021, the Company signed a supplement agreement with regard to amending the clause of the applicable distribution rate. The applicable distribution rate will be reset during the period from the 9th year after the issuance, to the basis rate plus 300 basis points, and will remain 8.79% afterwards.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major Provisions *(Cont'd)*

In 2019, the Company issued two tranches of China Life Financing Plan (the "China Life plan") with aggregate proceeds of RMB4,330 million. The China Life plan has no fixed period with an initial distribution rate of 5.05%. The interest of the China Life plan are recorded as distributions, which are paid annually in arrears in March, June, September and December in each year and may be deferred at the discretion of the Company unless compulsory payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The China Life plan has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 8th year of issuance, or the payment of the principal may be deferred at each distribution date mentioned above. The applicable distribution rate will be reset during the period from the 9th year after the issuance, to the basis rate plus 300 basis points, and will remain 8.05% afterwards.

In 2019, the Company issued two tranches of PICC Financing Plan ("the PICC plan") with aggregate proceeds of RMB2,670 million. The PICC plan has no fixed period with an initial distribution rate of 5.10%. The interest of the PICC plan is recorded as distributions, which are paid annually in arrears in March, June, September and December in each year and may be deferred at the discretion of the Company unless compulsory payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The PICC plan has no fixed maturity date and IS callable at the Company's discretion in whole at each distribution date after the 10th year of issuance, or the payment of the principal may be deferred at each distribution date mentioned above. The applicable distribution rate will be reset during the period from the 11th year after the issuance, to the basis rate plus 300 basis points, and will remain 8.10% afterwards.

In October 2019, the Company issued two tranches of medium-term notes with net proceeds of approximately RMB2,000 million and RMB2,000 million, respectively. The medium-term notes are issued at par value with initial distribution rates of 4.08% and 4.05%. The interest of the medium-term notes is recorded as distributions, which are paid annually in arrears in October in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The medium-term notes have no fixed maturity date and are callable at the Company's discretion at specific time, and the payment of the principal may be deferred for each renewal period to 3 years, respectively. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major provisions *(Cont'd)*

In November 2019, the Company issued two tranches of medium-term notes with net proceeds of approximately RMB2,500 million and RMB1,500 million. The medium-term notes are issued at par value with initial distribution rates of 4.15% and 4.53%, respectively. The interest of the medium-term notes IS recorded as distributions, which are paid annually in arrears in November in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interests and all deferred interest. The medium-term notes have no fixed maturity date and are callable at the Company's discretion at specific time, and the payment of the principal may be deferred for each renewal period to 3 and 5 years respectively. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

In March 2020, the Company issued two tranches of perpetual corporate bonds with net proceeds of approximately RMB2,000 million and RMB1,000 million, respectively. The perpetual corporate bonds are issued at par value with initial distribution rates of 3.58% and 3.85%. The interest of the perpetual corporate bonds is recorded as distributions, which are paid annually in arrears in March in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (e.g. distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The perpetual corporate bonds have no fixed maturity date and are callable at the Company's discretion in whole in February 2023 and 2025 respectively, and the payment of the principal may be deferred for each renewal period to 3 and 5 years respectively. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

In April 2020, the Company issued medium-term notes with net proceeds of approximately RMB3,000 million. The medium-term notes are issued at par value with an initial distribution rate of 3.18%. The interest of the medium-term notes is recorded as distributions, which are paid annually in arrears in April in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The medium-term notes have no fixed maturity date and are callable at the Company's discretion at specific time, and the payment of the principal may be deferred for each renewal period to 3 years. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major provisions *(Cont'd)*

In April 2020, the Company issued China Life Financing Plan ("the China Life plan") with proceeds of RMB3,570 million. The China Life plan has no fixed period with an initial distribution rate of 4.75%. The interest of the China Life plan is recorded as distributions, which are paid annually in arrears in March, June, September and December in each year and may be deferred at the discretion of the Company unless compulsory payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The China Life plan has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 8th year of issuance, or the payment of the principal may be deferred at each distribution date mentioned above. The applicable distribution rate will be reset during the period from the 9th year after the issuance, to the basis rate plus 300 basis points, and will remain 7.75% afterwards.

In April 2020, the Company issued the third tranche of the PICC plan with proceeds of RMB930 million. The PICC plan has no fixed period with an initial distribution rate of 4.75%. The interest of the PICC plan is recorded as distributions, which are paid annually in arrears in March, June, September and December in each year and may be deferred at the discretion of the Company unless compulsory payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The PICC plan has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 10th year of issuance, or the payment of the principal may be deferred at each distribution date mentioned above. The applicable distribution rate will be reset during the period from the 11th year after the issuance, to the basis rate plus 300 basis points, and will remain 7.75% afterwards.

In April 2020, the Company issued a perpetual corporate bond with net proceeds of approximately RMB2,500 million. The perpetual corporate bond is issued at par value with an initial distribution rate of 3.09%. The interest of the perpetual corporate bond is recorded as distributions, which are paid annually in arrears in April in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (e.g. distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The perpetual corporate bond has no fixed maturity date and is callable at the Company's discretion in whole in March 2023, or the payment of the principal may be deferred for each renewal period to 3 years. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major provisions *(Cont'd)*

In June 2020, the Company issued medium-term notes with net proceeds of approximately RMB3,500 million. The medium-term notes are issued at par value with an initial distribution rate of 3.60%. The interest of the medium-term notes is recorded as distributions, which are paid annually in arrears in June in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The medium-term notes have no fixed maturity date and are callable at the Company's discretion at specific time, and the payment of the principal may be deferred for each renewal period to 3 years. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

In August 2020 and September 2020, the Company issued two tranches of medium-term notes with net proceeds of approximately RMB2,000 million and RMB1,000 million, respectively. The medium-term notes are issued at par value with initial distribution rates of 3.99% and 4.40%. The interest of the medium-term notes is recorded as distributions, which are paid annually in arrears in August and September in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The medium-term notes have no fixed maturity date and are callable at the Company's discretion at specific time, and the payment of the principal may be deferred for each renewal period to 3 years, respectively. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

In August 2020, the Company issued the fourth tranche of the PICC plan with proceeds of RMB3,000 million. The PICC plan has no fixed period with an initial distribution rate of 4.60%. The interest of the PICC plan is recorded as distributions, which are paid annually in arrears in March, June, September and December in each year and may be deferred at the discretion of the Company unless compulsory payment events (distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The PICC plan has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 10th year of issuance, or the payment of the principal may be deferred at each distribution date mentioned above. The applicable distribution rate will be reset during the period from the 11th year after the issuance, to the basis rate plus 300 basis points, and will remain 7.60% afterwards.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major provisions *(Cont'd)*

In September 2020, the Company issued a perpetual corporate bond with net proceeds of approximately RMB3,000 million. The perpetual corporate bond is issued at par value with an initial distribution rate of 4.38%. The interest of the perpetual corporate bond is recorded as distributions, which are paid annually in arrears in September in each year and may be deferred at the discretion of the Company unless compulsory distribution payment events (e.g. distributions to ordinary shareholders of the Company or reduction of the registered capital of the Company) occur. The Company has the right to defer current interest and all deferred interest. The perpetual corporate bond has no fixed maturity date and is callable at the Company's discretion in whole in August 2023, and the payment of the principal may be deferred for each renewal period to 3 years. The applicable distribution rate will be reset on the first call date and for each renewal period after the first call date, to the sum of the applicable benchmark interest rate, the initial spread and 300 basis points per annum.

The perpetual corporate bonds, financing plans and medium-term notes were recorded as equity in the consolidated financial statements. During the year ended 31 December 2021, the profit attributable to holders of other equity instruments, based on the applicable distribution rate, was RMB2,137 million (2020: RMB1,770 million).

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(c) Changes of other equity instruments during 2021

Type of instruments	As at 1 January 2021		Issuance		Cumulative distributions				As at 31 December 2021	
	Number	Amount RMB'000	Number	Amount RMB'000	Accrued distribution RMB'000	Distribution payment RMB'000	Redemption value RMB'000	Redemption difference RMB'000	Number	Amount RMB'000
Bond B	25,000,000	2,534,678	–	–	129,250	129,256	–	–	25,000,000	2,534,672
Yingda Insurance Financing Plan (1st)	–	3,288,808	–	–	192,726	192,726	–	–	–	3,288,808
Yingda Insurance Financing Plan (2nd)	–	828,463	–	–	48,548	48,548	–	–	–	828,463
Yingda Insurance Financing Plan (3rd)	–	891,575	–	–	52,247	52,247	–	–	–	891,575
China Life Financing Plan (1st)	–	2,073,484	–	–	105,987	105,987	–	–	–	2,073,484
PICC Financing Plan (1st)	–	930,922	–	–	48,088	48,352	–	–	–	930,658
2019 medium-term notes (2nd)	20,000,000	2,011,579	–	–	81,600	81,601	–	–	20,000,000	2,011,578
2019 medium-term notes (3rd)	20,000,000	2,011,312	–	–	81,000	81,001	–	–	20,000,000	2,011,311
China Life Financing Plan (2nd)	–	2,263,804	–	–	115,715	115,715	–	–	–	2,263,804
PICC Financing Plan (2nd)	–	1,741,726	–	–	89,973	90,466	–	–	–	1,741,233
2019 medium-term notes (4th)	25,000,000	2,511,485	–	–	103,750	103,751	–	–	25,000,000	2,511,484
2019 medium-term notes (4th)	15,000,000	1,506,460	–	–	67,950	67,952	–	–	15,000,000	1,506,458
Bond C	20,000,000	2,055,691	–	–	71,600	71,604	–	–	20,000,000	2,055,687
Bond D	10,000,000	1,029,946	–	–	38,500	38,502	–	–	10,000,000	1,029,944
2020 medium-term notes (1st)	30,000,000	3,049,876	–	–	95,400	95,402	–	–	30,000,000	3,049,874
China Life Financing Plan (3rd)	–	3,575,653	–	–	171,930	171,930	–	–	–	3,575,653
PICC Financing Plan (3rd)	–	930,859	–	–	44,789	45,034	–	–	–	930,614
Bond E	25,000,000	2,553,521	–	–	77,250	77,254	–	–	25,000,000	2,553,517
2020 medium-term notes (2nd)	35,000,000	3,551,784	–	–	126,000	126,002	–	–	35,000,000	3,551,782
2020 medium-term notes (3rd)	20,000,000	2,024,828	–	–	79,800	79,801	–	–	20,000,000	2,024,827
PICC Financing Plan (4th)	–	3,002,683	–	–	139,917	140,683	–	–	–	3,001,917
Bond F	30,000,000	3,040,650	–	–	131,400	131,407	–	–	30,000,000	3,040,643
2020 medium-term notes (4th)	10,000,000	1,009,992	–	–	44,000	44,001	–	–	10,000,000	1,009,991
Total		48,419,779		–	2,137,420	2,139,222	–	–		48,417,977

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

22 SURPLUS RESERVES

	As at 1 January 2021 and 31 December 2021
Surplus reserves	8,140,030

According to the Company Law of the PRC, the Company's articles of association and board resolutions, the Company appropriates 10% of each year's net profit under PRC GAAP to the statutory surplus reserve. The Company has the option to cease making provision for such reserve when it reaches 50% of the registered share capital. Upon the approval from the relevant authorities, this reserve can be used to make up any losses incurred or to increase share capital. Except for offsetting against losses, this reserve cannot fall below 25% of the registered share after being used to increase share capital.

As the statutory surplus reserve reaches 50% of the registered share capital in 2021, the Company made no provision for the current year.

Appropriation of discretionary surplus reserve is proposed by the Board of Directors, and approved by the general meeting of shareholders. This reserve can be used to make up any losses incurred in prior years or to increase the share capital after obtaining relevant approvals. For the years ended 31 December 2021 and 2020, no provision was made to the discretionary surplus reserve.

According to the articles of association, in distributing the Company's profits after tax for the relevant accounting year, the lower of the amounts determined in accordance with PRC GAAP and IFRSs shall be adopted. As at 31 December 2021, in accordance with PRC GAAP and IFRSs, the balances of retained earnings for the Group amounted to approximately RMB16.013 billion and RMB16.568 billion, respectively; and the balances of retained earnings for the Company amounted to RMB28.202 billion and RMB23.306 billion, respectively.

23 DIVIDENDS OF ORDINARY SHARES AND CUMULATIVE DISTRIBUTION OF OTHER EQUITY INSTRUMENTS

(a) Dividends of ordinary shares

On 22 June 2021, upon the approval from the annual general meeting of the shareholders, the Company declared the 2020 final dividend of RMB0.18 (2019: RMB0.135) per ordinary share, totalling approximately RMB2,826 million (2019: RMB2,119 million).

On 21 March 2022, the Board of Directors proposed no cash dividend. This proposal is subject to the approval of the shareholders at the annual general meeting.

(b) Cumulative distribution of other equity instruments

The other equity instruments were recorded as equity in the consolidated financial statements. For the year ended 31 December 2021, the net profit attributable to holders of other equity instruments, based on the applicable rate, was RMB2,137 million, and the cumulative distribution paid in 2021 was RMB2,139 million.

24 LONG-TERM LOANS

Long-term loans comprised the following:

	As at 31 December	
	2021	2020
Loans from Huaneng Group and its subsidiaries (a)	**9,483,974**	7,031,664
Bank loans and other loans (b)	**144,587,541**	124,854,044
	154,071,515	131,885,708
Less: Current portion of long-term loans	**17,213,799**	19,808,313
Total	**136,857,716**	112,077,395

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

24 LONG-TERM LOANS *(Cont'd)*

(a) Loans from Huaneng Group and its subsidiaries

Details of loans from Huaneng Group and its subsidiaries are as follows:

	As at 31 December 2021				
	Original currency '000	RMB equivalent	Less: Current portion	Non–current portion	Annual interest rate
Loans from Huaneng Group					
Unsecured					
RMB					
– Variable rate	1,582,280	1,582,280	667,265	915,015	3.85%-4.75%
– Fixed rate	460,542	460,542	430	460,112	3.86%
Loans from Huaneng Finance					
Unsecured					
RMB					
– Variable rate	5,085,239	5,085,239	450,688	4,634,551	3.00%-4.51%
– Fixed rate	548,506	548,506	806	547,700	3.60%-3.71%
Loans from Huaneng Tiancheng Financial Leasing Co., Ltd. ("Tiancheng Financial Leasing")					
Secured					
RMB					
– Variable rate	371,356	371,356	81,356	290,000	4.10%-5.20%
– Fixed rate	239,626	239,626	2,445	237,181	3.80%-4.65%
Loans from Hong Kong Asset Management Co., Ltd. ("Hong Kong Asset Management")					
Unsecured					
US$					
– Variable rate	188,125	1,196,425	430	1,195,995	2.30%-4.90%
Total		9,483,974	1,203,420	8,280,554	

24 LONG-TERM LOANS *(Cont'd)*

(a) Loans from Huaneng Group and its subsidiaries *(Cont'd)*

	As at 31 December 2020				
	Original currency '000	RMB equivalent	Less: Current portion	Non–current portion	Annual interest rate
Loans from Huaneng Group					
Unsecured					
RMB					
– Variable rate	666,190	666,190	24,530	641,660	4.75%
Loans from Huaneng Finance					
Unsecured					
RMB					
– Variable rate	4,281,432	4,281,432	468,800	3,812,632	3.67%-4.80%
– Fixed rate	317,515	317,515	26,200	291,315	4.02%-4.75%
Loans from Tiancheng Financial Leasing					
Secured					
RMB					
– Variable rate	633,258	633,258	100,040	533,218	4.42%-5.20%
– Fixed rate	89,060	89,060	–	89,060	5.10%
Loans from Hong Kong Asset Management					
Unsecured					
US$					
– Variable rate	160,035	1,044,209	–	1,044,209	2.30%
Total		7,031,664	619,570	6,412,094	

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

24 LONG-TERM LOANS *(Cont'd)*

(b) Bank loans and other loans

Details of bank loans and other loans are as follows:

	As at 31 December 2021				
	Original currency '000	RMB equivalent	Less: Current portion	Non–current portion	Annual interest rate
Secured					
RMB					
– Fixed rate	302,677	302,677	40,177	262,500	4.66%
– Variable rate	10,415,690	10,415,690	1,727,798	8,687,892	4.10%-4.98%
S$					
– Variable rate	130,588	616,390	3,954	612,436	1.42%
Unsecured					
RMB					
– Fixed rate	5,722,075	5,722,075	672,640	5,049,435	3.30%-4.75%
– Variable rate	113,708,136	113,708,136	12,368,979	101,339,157	2.95%-4.90%
US$					
– Variable rate	1,187,581	7,397,365	1,156,882	6,240,483	1.42%-4.63%
S$					
– Variable rate	1,325,680	6,257,351	2,927	6,254,424	1.85%
€					
– Fixed rate	6,685	48,373	30,653	17,720	2.00%-2.15%
JPY					
– Fixed rate	2,151,357	119,484	6,369	113,115	0.75%
Total		144,587,541	16,010,379	128,577,162	

24 LONG-TERM LOANS *(Cont'd)*

(b) Bank loans and other loans *(Cont'd)*

	As at 31 December 2020				
	Original currency '000	RMB equivalent	Less: Current portion	Non–current portion	Annual interest rate
Secured					
RMB					
– Fixed rate	302,677	302,677	–	302,677	4.66%
– Variable rate	9,136,041	9,136,041	1,242,992	7,893,049	4.10%-4.98%
S$					
– Variable rate	120,999	596,693	14,119	582,574	1.42%
Unsecured					
RMB					
– Fixed rate	2,805,767	2,805,767	316,715	2,489,052	4.02%-5.39%
– Variable rate	96,118,275	96,118,275	16,355,517	79,762,758	1.80%-6.55%
US$					
– Variable rate	1,319,503	8,609,627	1,217,769	7,391,858	1.42%-4.73%
S$					
– Variable rate	1,430,286	7,053,310	–	7,053,310	1.85%
€					
– Fixed rate	11,004	88,322	34,654	53,668	2.00%-2.15%
JPY					
– Fixed rate	2,266,468	143,332	6,977	136,355	0.75%
Total		124,854,044	19,188,743	105,665,301	

As at 31 December 2021, long-term loans of approximately RMB4,516 million were secured by future revenue from the electricity business (31 December 2020: RMB7,435 million). Long-term loans of approximately RMB2,814 million (31 December 2020: nil) were secured by equity interests of a subsidiary of the Company. Long-term loans of approximately RMB20 million were secured by carbon emission trading rights (31 December 2020: nil).

As at 31 December 2021, long-term loans of RMB4,595 million (31 December 2020: RMB3,322 million) were secured by certain property, plant and equipment with a net book value amounting to approximately RMB5,025 million (31 December 2020: RMB3,400 million).

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

24 LONG-TERM LOANS *(Cont'd)*

(b) Bank loans and other loans *(Cont'd)*

Certain subsidiaries of the Group had sales and leaseback agreements with Tiancheng Financial Leasing and other financial leasing companies. According to the agreements, these subsidiaries have an option to buy back the equipment at a nominal price (RMB1) when the lease term expires. The substance of the transaction was to obtain financing secured by the relevant assets within the leasing period. As at 31 December 2021, the equipment mentioned above had total carrying amounts of RMB858 million and RMB4,111 million (31 December 2020: RMB1,036 million and RMB2,364 million) respectively, which were recognised in property, plant and equipment while the long-term borrowings were RMB611 million and RMB3,984 million (31 December 2020: RMB722 million and RMB2,600 million) from Tiancheng Financial Leasing and other financial leasing companies, respectively.

As at 31 December 2021, long-term loans of approximately RMB44 million (31 December 2020: RMB81 million) were guaranteed by Huaneng Group.

As at 31 December 2021, the Company provided guarantees for long-term loans of approximately RMB6,257 million (31 December 2020: RMB7,053 million) of the Company's overseas subsidiaries.

As at 31 December 2021, long-term loans of approximately RMB1,178 million (31 December 2020: RMB1,731 million) were guaranteed by other subsidiaries of the Company and Yangguang Jiedi Investment Co., Ltd, of which the loans guaranteed by Yangguang Jiedi Investment Co., Ltd were RMB47 million (31 December 2020: RMB67 million).

As at 31 December 2021, no long-term loans (31 December 2020: RMB50 million) were guaranteed by Shandong Lineng Group Co., Ltd.

As at 31 December 2021, long-term loans of approximately RMB120 million (31 December 2020: RMB143 million) were guaranteed by Enshi Finance Bureau of Hubei Province.

As at 31 December 2021, long-term loans of approximately RMB176 million (31 December 2020: nil) were guaranteed by Shandong Power.

As at 31 December 2021, long-term loans of approximately RMB6,794 million (31 December 2020: RMB7,581 million) were guaranteed by Shandong Power, China Export & Credit Insurance Corporation and Jining Chengtou Holding Group Co., Ltd. ("Jining Chengtou") (31 December 2020: Huaneng Group, China Export & Credit Insurance Corporation and Shandong Ruyi Technology Group) at the liability ratios of 17.5%, 65.0% and 17.5% respectively.

24 LONG-TERM LOANS *(Cont'd)*

(b) Bank loans and other loans *(Cont'd)*

As at 31 December 2021, long-term loans of approximately RMB1,020 million (31 December 2020: RMB1,044 million) were guaranteed by Shandong Power and Jining Chengtou (31 December 2020: Shandong Power and Shandong Ruyi Technology Group) at the liability ratios of 50% and 50% respectively.

The maturity of long-term loans is as follows:

	Loans from			
	Huaneng Group and its subsidiaries As at 31 December		Bank loans and other loans As at 31 December	
	2021	2020	**2021**	2020
Within 1 year	**1,203,420**	619,570	**16,010,379**	19,188,743
After 1 year but within 2 years	**2,032,272**	826,059	**23,480,443**	13,718,115
After 2 years but within 5 years	**4,361,292**	2,799,377	**56,017,602**	45,708,377
After 5 years	**1,886,990**	2,786,658	**49,079,117**	46,238,809
	9,483,974	7,031,664	**144,587,541**	124,854,044
Less: amount due within 1 year included under current liabilities	**1,203,420**	619,570	**16,010,379**	19,188,743
Total	**8,280,554**	6,412,094	**128,577,162**	105,665,301

The maturity profile of the Group's long-term loans as at the end of the reporting period, based on the contractual undiscounted payments, is as follows:

	As at 31 December	
	2021	2020
Within 1 year	**22,545,617**	24,926,875
After 1 year but within 2 years	**30,588,971**	19,014,680
After 2 years but within 5 years	**70,138,254**	57,766,661
After 5 years	**78,319,136**	75,686,206
	201,591,978	177,394,422

25 LONG-TERM BONDS

Outstanding corporate bonds, medium-term notes and debt financing instrument of the Group as at 31 December 2021 are summarised as follows:

Type of Instruments	Face Value RMB'000	Issuance Date	Initial Period	Initial Distribution Rate	Effective Rate	Issue Price RMB'000	Balance as at 31 December 2020 RMB'000	Issued Amount RMB'000	Amortisation RMB'000	Interest RMB'000	Repayment RMB'000	Foreign Exchange Gain RMB'000	Foreign Currency Transition Differences RMB'000	Interest Payable RMB'000	Balance as at 31 December 2021 RMB'000
2016 corporate bonds (5 years)	3,000,000	June 2016	5 years	3.48%	3.48%	3,000,000	3,057,912	–	(125)	46,622	(3,104,400)	–	–	–	9
2016 corporate bonds (10 years)	1,200,000	June 2016	10 years	3.98%	3.98%	1,200,000	1,226,429	–	12	47,761	(47,760)	–	–	26,432	1,226,442
2017 medium-term notes (5 years)	5,000,000	July 2017	5 years	4.69%	4.90%	5,000,000	5,113,989	–	939	234,500	(234,500)	–	–	111,147	5,114,928
2018 corporate bonds (3 years)	1,500,000	April 2018	3 years	4.90%	4.90%	1,500,000	1,554,843	–	(70)	18,727	(1,573,500)	–	–	–	–
2018 medium-term notes (3 years)	3,000,000	May 2018	3 years	4.80%	4.91%	3,000,000	3,095,285	–	977	47,738	(3,144,000)	–	–	–	–
2018 medium-term notes (3 years)	2,000,000	July 2018	3 years	4.41%	4.56%	2,000,000	2,043,397	–	1,448	46,154	(2,088,200)	–	–	–	2,799
2018 debt financing instrument (3 years)	2,500,000	July 2018	3 years	4.68%	4.81%	2,500,000	2,549,443	–	1,524	66,033	(2,617,000)	–	–	–	–
2018 corporate bonds (10 years)	5,000,000	September 2018	10 years	5.05%	5.05%	5,000,000	5,078,194	–	30	252,500	(252,500)	–	–	78,171	5,078,224
2019 corporate bonds (10 years)	2,300,000	April 2019	10 years	4.70%	4.70%	2,300,000	2,374,934	–	14	108,100	(108,100)	–	–	74,930	2,374,948
2019 corporate bonds (3 years)	1,000,000	July 2019	3 years	3.55%	3.55%	1,000,000	1,017,142	–	17	35,501	(35,500)	–	–	17,118	1,017,160
2019 medium-term notes (3 years)	500,000	July 2019	3 years	3.55%	3.65%	500,000	507,320	–	488	17,749	(17,750)	–	–	8,073	507,807
2019 medium-term notes (5 years)	1,500,000	July 2019	5 years	3.85%	3.96%	1,500,000	1,521,142	–	1,445	57,750	(57,750)	–	–	26,264	1,522,587
2020 corporate bonds (5 years)	2,108,865	February 2020	5 years	2.25%	2.32%	2,108,865	1,963,164	40,197	2,092	42,354	(42,728)	8,520	(92,804)	16,011	1,920,795
2020 corporate bonds (10 years)	2,108,865	February 2020	10 years	2.63%	2.72%	2,108,865	1,957,722	40,196	1,643	49,415	(49,849)	8,520	(92,450)	18,679	1,915,197
2021 medium-term notes (3 years)	1,000,000	February 2021	3 years	3.45%	3.66%	1,000,000	–	1,000,000	(202)	30,814	–	–	–	30,814	1,030,612
2021 medium-term notes (3 years)	2,500,000	April 2021	3 years	3.35%	3.40%	2,500,000	–	2,500,000	(340)	59,658	–	–	–	59,658	2,559,318
2021 corporate bonds (3 years)	500,000	May 2021	3 years	3.35%	3.35%	500,000	–	500,000	2	10,187	–	–	–	10,188	510,189
2021 corporate bonds (10 years)	1,500,000	May 2021	10 years	3.97%	3.97%	1,500,000	–	1,500,000	(8)	36,220	–	–	–	36,219	1,536,212
2021 corporate bonds (3 years)	500,000	June 2021	3 years	3.33%	3.33%	500,000	–	500,000	1	9,488	–	–	–	9,488	509,489
2021 corporate bonds (10 years)	3,500,000	June 2021	10 years	3.97%	3.97%	3,500,000	–	3,500,000	(19)	79,182	–	–	–	79,182	3,579,163
2021 corporate bonds (10 years)	1,800,000	June 2021	10 years	3.99%	3.99%	1,800,000	–	1,800,000	(10)	38,172	–	–	–	38,173	1,838,162
2021 corporate bonds (3 years)	2,000,000	August 2021	3 years	2.99%	3.01%	2,000,000	–	2,000,000	(211)	22,281	–	–	–	22,282	2,022,070
2021 corporate bonds (3 years)	2,000,000	November 2021	3 years	3.07%	3.07%	2,000,000	–	2,000,000	1	6,224	–	–	–	6,224	2,006,225
2021 medium-term bonds (3 years)	300,000	December 2021	3 years	2.95%	2.95%	300,000	–	300,000	–	123	–	–	–	123	300,123
Total						48,317,730	33,060,916	15,680,393	9,648	1,363,253	(13,373,537)	17,040	(185,254)	669,176	36,572,459

25 LONG-TERM BONDS *(Cont'd)*

Outstanding corporate bonds, medium-term notes and debt financing instrument of the Group as at 31 December 2020 are summarised as follows:

Type of Instruments	Face Value RMB'000	Issuance Date	Initial Period	Initial Distribution Rate	Effective Rate	Issue Price RMB'000	Balance as at 31 December 2019 RMB'000	Issued Amount RMB'000	Amortisation RMB'000	Interest RMB'000	Repayment RMB'000	Foreign Exchange Gain RMB'000	Foreign Currency Transition Differences RMB'000	Interest Payable RMB'000	Balance as at 31 December 2020 RMB'000
2016 corporate bonds (5 years)	3,000,000	June 2016	5 years	3.48%	3.48%	3,000,000	3,000,072	–	62	104,400	–	–	–	57,778	3,057,912
2016 corporate bonds (10 years)	1,200,000	June 2016	10 years	3.98%	3.98%	1,200,000	1,199,985	–	12	47,760	–	–	–	26,432	1,226,429
2017 medium-term notes (5 years)	5,000,000	July 2017	5 years	4.69%	4.90%	5,000,000	5,001,878	–	965	234,500	–	–	–	111,146	5,113,989
2017 debt financing instrument (3 years)	500,000	July 2017	3 years	4.75%	4.81%	500,000	499,846	–	154	23,750	(500,000)	–	–	–	–
2017 corporate bonds (3 years)	2,300,000	November 2017	3 years	4.99%	4.99%	2,300,000	2,299,962	–	38	114,770	(2,300,000)	–	–	–	–
2018 corporate bonds (3 years)	1,500,000	April 2018	3 years	4.90%	4.90%	1,500,000	1,500,040	–	30	73,500	–	–	–	54,773	1,554,843
2018 medium-term notes (3 years)	3,000,000	May 2018	3 years	4.80%	4.91%	3,000,000	2,996,069	–	2,953	144,000	–	–	–	96,263	3,095,285
2018 medium-term notes (3 years)	2,000,000	July 2018	3 years	4.41%	4.56%	2,000,000	2,001,342	–	9	88,200	–	–	–	42,046	2,043,397
2018 debt financing instrument (3 years)	2,500,000	July 2018	3 years	4.68%	4.81%	2,500,000	2,495,547	–	2,929	117,000	–	–	–	50,967	2,549,443
2018 corporate bonds (10 years)	5,000,000	September 2018	10 years	5.05%	5.05%	5,000,000	4,999,993	–	30	252,500	–	–	–	78,171	5,078,194
2019 corporate bonds (10 years)	2,300,000	April 2019	10 years	4.70%	4.70%	2,300,000	2,299,990	–	14	108,100	–	–	–	74,930	2,374,934
2019 corporate bonds (3 years)	1,000,000	July 2019	3 years	3.55%	3.55%	1,000,000	1,000,007	–	17	35,500	–	–	–	17,118	1,017,142
2019 medium-term notes (3 years)	500,000	July 2019	3 years	3.55%	3.65%	500,000	498,759	–	488	17,750	–	–	–	8,073	507,320
2019 medium-term notes (5 years)	1,500,000	July 2019	5 years	3.85%	3.96%	1,500,000	1,493,433	–	1,445	57,750	–	–	–	26,264	1,521,142
2020 corporate bonds (5 years)	2,108,865	February 2020	5 years	2.25%	2.32%	2,108,865	–	2,108,865	(9,456)	40,838	–	(23,160)	(129,468)	16,383	1,963,164
2020 corporate bonds (10 years)	2,108,865	February 2020	10 years	2.63%	2.72%	2,108,865	–	2,108,865	(17,629)	47,644	–	(23,160)	(129,468)	19,114	1,957,722
Total						35,517,730	31,286,923	4,217,730	(17,939)	1,507,962	(2,800,000)	(46,320)	(258,936)	679,458	33,060,916

As at 31 December 2021, the Company provided guarantees for long-term bonds of approximately RMB3,826 million (31 December 2020: RMB3,921 million) of the Company's overseas subsidiary.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

25 LONG-TERM BONDS *(Cont'd)*

The maturity profile of the Group's long-term bonds as at the end of the reporting period, based on the contractual undiscounted payments, is as follows:

	As at 31 December	
	2021	2020
Within 1 year	**8,457,746**	13,791,536
After 1 year but within 2 years	**1,277,140**	7,225,082
After 2 years but within 5 years	**16,048,337**	6,213,583
After 5 years	**18,405,291**	10,495,622
	44,188,514	37,725,823

26 OTHER NON-CURRENT LIABILITIES

	As at 31 December	
	2021	2020
Government grants		
– Environmental subsidies (a)	**1,103,425**	1,102,074
– Other government grants (b)	**1,089,689**	324,325
Contract liabilities	**2,894,543**	2,623,764
Other deferred income	**33,432**	41,324
Others (c)	**969,900**	758,058
Subtotal	**6,090,989**	4,849,545
Current portion of other non-current liabilities	**(68,972)**	(65,277)
Subtotal	**(68,972)**	(65,277)
Total	**6,022,017**	4,784,268

(a) This primarily represented subsidies for the construction of desulphurisation equipment and other environmental protection projects.

(b) As at 31 December 2021, among other government grants, there was standby compensation of Huaneng Power International, Inc. Jining Power Plant amounting to RMB793 million with unfulfilled conditions.

(c) As at 31 December 2021, included in others, there were financial liabilities amounting to RMB887 million (31 December 2020: RMB640 million), which were comprised of mining right payables, guarantee deposits, poverty relief payables, etc.

26 OTHER NON-CURRENT LIABILITIES *(Cont'd)*

The maturity profile of the Group's other non-current financial liabilities as at the end of the reporting period, based on the contractual undiscounted payments, is as follows:

	As at 31 December	
	2021	2020
Within 1 year	**90,847**	77,741
After 1 year but within 2 years	**104,837**	72,346
After 2 years but within 5 years	**175,691**	140,963
After 5 years	**669,985**	403,331
	1,041,360	694,381

27 ACCOUNTS PAYABLE AND OTHER LIABILITIES

Accounts payable and other liabilities comprised:

	As at 31 December	
	2021	2020
Accounts and notes payables	**25,774,238**	15,777,784
Payables to contractors for construction	**19,922,953**	18,734,201
Retention payables to contractors	**1,795,819**	1,530,764
Consideration payables for business acquisition	**22,842**	22,842
Others	**7,093,701**	6,689,770
Total	**54,609,553**	42,755,361

Please refer to Note 36(a)(iv) for details of accounts payable and other liabilities due to the related parties.

As at 31 December 2021, there were notes payable amounting to RMB7 million (31 December 2020: RMB245 million) secured by notes receivable.

As at 31 December 2021 and 31 December 2020, the accounts and notes payables and other liabilities are non-interest-bearing.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

27 ACCOUNTS PAYABLE AND OTHER LIABILITIES *(Cont'd)*

The carrying amounts of accounts payable and other liabilities are denominated in the following currencies:

	As at 31 December	
	2021	2020
RMB	**50,956,022**	40,610,454
S$ (RMB equivalent)	**1,537,356**	948,817
US$ (RMB equivalent)	**576,113**	799,989
JPY (RMB equivalent)	**13,988**	12,293
EUR (RMB equivalent)	**–**	224
PKR (RMB equivalent)	**1,526,074**	383,584
Total	**54,609,553**	42,755,361

The ageing analysis of accounts and notes payable was as follows:

	As at 31 December	
	2021	2020
Within 1 year	**25,271,613**	15,514,112
Between 1 to 2 years	**373,752**	166,088
Over 2 years	**128,873**	97,584
Total	**25,774,238**	15,777,784

28 TAXES PAYABLE

Taxes payable comprise:

	As at 31 December	
	2021	2020
VAT payable	**955,497**	1,159,562
Income tax payable	**227,880**	288,106
Others	**870,041**	597,201
Total	**2,053,418**	2,044,869

29 SHORT-TERM BONDS

Outstanding short-term bonds as at 31 December 2021 are summarised as follows:

Type of Instruments	Face Value RMB'000	Issuance Date	Maturity	Issue Price RMB'000	Coupon Rate	Balance as at 31 December 2020 RMB'000	Issued Amount RMB'000	Interest RMB'000	Amortisation RMB'000	Repayment RMB'000	Balance as at 31 December 2021 RMB'000
Super short-term bond (2020 8th)	2,000,000	December 2020	30 days	2,000,000	1.50%	2,001,951	–	575	(60)	(2,002,466)	–
Super short-term bond (2020 9th)	3,000,000	December 2020	30 days	3,000,000	1.40%	3,000,926	–	2,416	110	(3,003,452)	–
Super short-term bond (2021 1st)	2,000,000	January 2021	37 days	2,000,000	2.18%	–	2,000,000	5,548	–	(2,005,548)	–
Super short-term bond (2021 2nd)	3,000,000	January 2021	30 days	3,000,000	2.25%	–	3,000,000	8,088	–	(3,008,088)	–
Super short-term bond (2021 3rd)	3,000,000	February 2021	41 days	3,000,000	2.40%	–	3,000,000	4,258	–	(3,004,258)	–
Super short-term bond (2021 4th)	2,000,000	April 2021	37 days	2,000,000	2.10%	–	2,000,000	6,302	–	(2,006,302)	–
Super short-term bond (2021 5th)	3,000,000	April 2021	36 days	3,000,000	2.13%	–	3,000,000	4,420	–	(3,004,420)	–
Super short-term bond (2021 6th)	2,000,000	July 2021	29 days	2,000,000	2.07%	–	2,000,000	3,630	–	(2,003,630)	–
Super short-term bond (2021 7th)	3,000,000	July 2021	29 days	3,000,000	2.05%	–	3,000,000	5,897	–	(3,005,897)	–
Super short-term bond (2021 8th)	2,500,000	July 2021	36 days	2,500,000	2.03%	–	2,500,000	5,840	–	(2,505,840)	–
Super short-term bond (2021 9th)	1,500,000	August 2021	54 days	1,500,000	2.00%	–	1,500,000	3,205	–	(1,503,205)	–
Super short-term bond (2021 10th)	2,000,000	August 2021	54 days	2,000,000	2.14%	–	2,000,000	3,752	–	(2,003,752)	–
Super short-term bond (2021 11th)	3,000,000	September 2021	54 days	3,000,000	2.13%	–	3,000,000	4,902	–	(3,004,902)	–
Super short-term bond (2021 12th)	1,500,000	September 2021	54 days	1,500,000	2.03%	–	1,500,000	1,752	–	(1,501,752)	–
Super short-term bond (2021 13th)	1,500,000	October 2021	29 days	1,500,000	2.05%	–	1,500,000	1,432	–	(1,501,432)	–
Super short-term bond (2021 14th)	3,000,000	October 2021	29 days	3,000,000	2.17%	–	3,000,000	1,784	–	(3,001,784)	–
Super short-term bond (2021 15th)	2,000,000	October 2021	36 days	2,000,000	2.12%	–	2,000,000	581	–	(2,000,581)	–
Super short-term bond (2021 16th)	5,000,000	November 2021	98 days	5,000,000	2.38%	–	5,000,000	18,910	22	–	5,018,932
Super short-term bond (2021 17th)	3,000,000	December 2021	29 days	3,000,000	2.22%	–	3,000,000	3,467	75	–	3,003,542
Super short-term bond (JiangSu2021 1st)	200,000	December 2021	270 days	200,000	2.60%	–	200,000	43	–	–	200,043
Total				48,200,000		5,002,877	43,200,000	86,802	147	(40,067,309)	8,222,517

29 SHORT-TERM BONDS *(Cont'd)*

Outstanding short-term bonds as at 31 December 2020 are summarised as follows:

Type of Instruments	Face Value RMB'000	Issuance Date	Maturity	Issue Price RMB'000	Coupon Rate	Balance as at 31 December 2019 RMB'000	Issued Amount RMB'000	Interest RMB'000	Amortisation RMB'000	Repayment RMB'000	Balance as at 31 December 2020 RMB'000
Super short-term bond (2019 9th)	5,000,000	October 2019	180 days	5,000,000	2.09%	5,018,170	–	33,977	(754)	(5,051,393)	–
Super short-term bond (2019 10th)	2,000,000	November 2019	90 days	2,000,000	2.00%	2,006,098	–	3,934	(196)	(2,009,836)	–
Super short-term bond (2019 11th)	2,000,000	December 2019	60 days	2,000,000	1.80%	2,001,267	–	4,722	(87)	(2,005,902)	–
Super short-term bond (2020 1st)	2,000,000	February 2020	90 days	2,000,000	1.70%	–	2,000,000	8,361	–	(2,008,361)	–
Super short-term bond (2020 2nd)	2,000,000	February 2020	60 days	2,000,000	1.50%	–	2,000,000	4,918	–	(2,004,918)	–
Super short-term bond (2020 3rd)	2,000,000	April 2020	60 days	2,000,000	1.20%	–	2,000,000	3,945	–	(2,003,945)	–
Super short-term bond (2020 4th)	2,000,000	May 2020	90 days	2,000,000	1.20%	–	2,000,000	5,918	–	(2,005,918)	–
Super short-term bond (2020 5th)	2,000,000	October 2020	30 days	2,000,000	1.30%	–	2,000,000	2,137	–	(2,002,137)	–
Super short-term bond (2020 6th)	2,000,000	November 2020	30 days	2,000,000	1.30%	–	2,000,000	2,137	–	(2,002,137)	–
Super short-term bond (2020 7th)	3,000,000	November 2020	30 days	3,000,000	1.40%	–	3,000,000	3,452	–	(3,003,452)	–
Super short-term bond (2020 8th)	2,000,000	December 2020	30 days	2,000,000	1.50%	–	2,000,000	1,891	60	–	2,001,951
Super short-term bond (2020 9th)	3,000,000	December 2020	30 days	3,000,000	1.40%	–	3,000,000	1,036	(110)	–	3,000,926
Total				29,000,000		9,025,535	20,000,000	76,428	(1,087)	(24,097,999)	5,002,877

30 SHORT-TERM LOANS

Short-term loans are as follows:

	As at 31 December 2021			As at 31 December 2020		
	Original currency '000	RMB equivalent	Annual interest rate	Original currency '000	RMB equivalent	Annual interest rate
Secured						
RMB						
– Fixed rate	775,945	775,945	2.00%-4.24%	1,614,700	1,614,700	2.85%-4.77%
– Variable rate	439,754	439,754	2.35%-4.96%	49,455	49,455	3.15%-3.96%
Unsecured						
RMB						
– Fixed rate	21,765,522	21,765,522	2.55%-4.35%	13,093,783	13,093,783	2.15%-4.75%
– Variable rate	68,767,248	68,767,248	2.80%-4.35%	51,441,800	51,441,800	2.30%-4.37%
US$						
– Fixed rate	–	–	–	17,076	111,422	4.90%
PKR						
– Variable rate	4,100,000	148,256	11.35%	–	–	–
Total		91,896,725			66,311,160	

As at 31 December 2021, short-term loans of RMB829 million (31 December 2020: RMB1,317 million) represented the notes receivable that were discounted with recourse. As these notes receivable had not yet matured, the proceeds received were recorded as short-term loans.

As at 31 December 2021, short-term loans of RMB387 million (31 December 2020: RMB347 million) were secured by certain equipment with a net book value amounting to approximately RMB475 million. (31 December 2020: RMB347 million).

As at 31 December 2021, short-term loans of RMB148 million were guaranteed by Shandong Luyi Power International Limited Company. (31 December 2020: nil)

As at 31 December 2021, no short-term loans (31 December 2020: RMB111 million) were borrowed from Hong Kong Asset Management.

As at 31 December 2021, short-term loans borrowed from Huaneng Finance amounted to RMB9,432 million (31 December 2020: RMB10,059 million) with annual interest rates ranging from 2.90% to 4.10% (31 December 2020: from 3.62% to 4.75%). Short-term loans borrowed from Tiancheng Financial Leasing amounted to RMB387 million (31 December 2020: RMB347 million) with annual interest rates ranging from 3.75% to 4.24% (31 December 2020: 4.15% to 4.77%). Short-term loans borrowed from Huaneng Group amounted to RMB2,294 million (31 December 2020: nil) with annual interest rates 3.58%.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

31 DEFERRED INCOME TAX ASSETS AND LIABILITIES

The deferred income tax assets and liabilities are as follows:

	As at 31 December	
	2021	2020
Deferred income tax assets before offsetting	**6,301,920**	3,607,935
Offset amount	**(1,394,839)**	(908,540)
Deferred income tax assets after offsetting	**4,907,081**	2,699,395
Deferred income tax liabilities before offsetting	**(3,694,927)**	(3,911,067)
Offset amount	**1,394,839**	908,540
Deferred income tax liabilities after offsetting	**(2,300,088)**	(3,002,527)
	2,606,993	(303,132)

The gross movements in the deferred income tax accounts are as follows:

	2021	2020
Beginning of the year	**(303,132)**	(977,604)
Business combination	**–**	(16,000)
Credited to profit or loss (Note 33)	**2,969,675**	658,128
(Charged)/credited to other comprehensive income	**(91,641)**	1,751
Currency translation differences	**32,091**	30,593
End of the year	**2,606,993**	(303,132)

31 DEFERRED INCOME TAX ASSETS AND LIABILITIES *(Cont'd)*

The movements in deferred income tax assets and liabilities during the year, without taking into consideration the offsetting of balances within the same tax jurisdictions, are as follows:

Deferred income tax assets:

	Hedging reserve	Fair value losses	Amortisation of land use rights	Provision for impairment loss	Depreciation	Accrued expenses	VAT refunds on purchases of domestically manufactured equipment	Unused tax losses	Lease liabilities	Others	Total
As at 1 January 2020	61,376	80,359	12,436	818,940	840,535	75,987	128,710	549,759	965	1,275,076	3,844,143
(Charged)/credited to profit or loss	–	–	(493)	(84,470)	107,634	(2,439)	(25,424)	(146,025)	1,845	(81,907)	(231,279)
(Charged)/credited to other comprehensive income	(42,245)	43,564	–	–	–	–	–	–	–	–	1,319
Currency translation differences	(2,121)	–	–	(423)	–	–	–	–	–	(3,704)	(6,248)
As at 31 December 2020	17,010	123,923	11,943	734,047	948,169	73,548	103,286	403,734	2,810	1,189,465	3,607,935
(Charged)/credited to profit or loss	–	–	(137)	(44,271)	(135,976)	(52,232)	(55,084)	3,232,448	16,130	(278,946)	2,681,932
(Charged)/credited to other comprehensive income	424	11,754	–	–	–	–	–	–	–	–	12,178
Currency translation differences	1,237	–	–	(459)	–	–	–	–	–	(903)	(125)
As at 31 December 2021	18,671	135,677	11,806	689,317	812,193	21,316	48,202	3,636,182	18,940	909,616	6,301,920

31 DEFERRED INCOME TAX ASSETS AND LIABILITIES *(Cont'd)*

Deferred income tax liabilities:

	Hedging reserve	Fair value gains	Amortisation of land use rights	Depreciation	Power generation licence	Mining rights	Territorial water use right	Right-of-use assets	Others	Total
As at 1 January 2020	–	(6,731)	(946,676)	(2,997,191)	(705,407)	(129,383)	(2,409)	(120)	(33,830)	(4,821,747)
Business combination	–	–	–	(16,000)	–	–	–	–	–	(16,000)
Credited to profit or loss	–	–	40,728	833,864	–	–	–	(4,659)	19,474	889,407
Charged to other comprehensive income	–	432	–	–	–	–	–	–	–	432
Currency translation differences	–	–	(702)	4,483	33,060	–	–	–	–	36,841
As at 31 December 2020	–	(6,299)	(906,650)	(2,174,844)	(672,347)	(129,383)	(2,409)	(4,779)	(14,356)	(3,911,067)
Credited to profit or loss	–	–	116,517	260,875	–	–	2,409	(5,843)	(86,215)	287,743
Charged to other comprehensive income	(104,295)	476	–	–	–	–	–	–	–	(103,819)
Currency translation differences	–	–	–	3,107	29,109	–	–	–	–	32,216
As at 31 December 2021	(104,295)	(5,823)	(790,133)	(1,910,862)	(643,238)	(129,383)	–	(10,622)	(100,571)	(3,694,927)

31 DEFERRED INCOME TAX ASSETS AND LIABILITIES *(Cont'd)*

As at 31 December 2021 and 2020, taxable temporary differences relating to interests in equity method investees amounted to RMB4.85 billion and RMB5.04 billion, respectively. No deferred tax liabilities were recognised as at 31 December 2021 and 2020 as dividends from investments in associates and joint ventures are exempted from the PRC income tax and the Company has no plan to dispose of any of these investees in the foreseeable future.

As at 31 December 2021 and 2020, taxable temporary differences relating to the interests in foreign subsidiaries amounted to RMB2.34 billion and RMB2.12 billion, respectively. No deferred tax liabilities were recognised in respect of the tax that would be payable on the distribution of these interests as at 31 December 2021 and 2020 as the Company controls the dividend policy of the subsidiaries, and it has been determined that it is probable that the interests will not be distributed in the foreseeable future, and the Company has no plan to dispose of any of these investees in the foreseeable future.

In accordance with the accounting policy set out in Note 2(w), the Group did not recognise deferred income tax assets in respect of certain deductible temporary differences and accumulated tax losses that can be carried forward against future taxable income as follows:

	As at 31 December	
	2021	2020
Deductible temporary differences	**16,076,139**	14,885,723
Unused tax losses	**19,919,286**	10,917,409
Total	**35,995,425**	25,803,132

The expiry dates of the tax losses of the Group for which no deferred income tax assets were recognised are summarised as follows:

	As at 31 December	
	2021	2020
Year of expiry		
2021	**–**	1,400,289
2022	**2,415,361**	2,124,756
2023	**2,649,192**	2,421,087
2024	**2,794,796**	2,966,842
2025	**1,937,943**	2,004,435
2026	**10,121,994**	–
Total	**19,919,286**	10,917,409

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

32 ADDITIONAL FINANCIAL INFORMATION TO THE CONSOLIDATED STATEMENT OF FINANCIAL POSITION

As at 31 December 2021, the net current liabilities of the Group amounted to approximately RMB93,927 million (2020: RMB87,910 million). On the same date, total assets less current liabilities were approximately RMB314,373 million (2020: RMB295,857 million).

33 INCOME TAX EXPENSE

	For the year ended 31 December	
	2021	2020
Current income tax expense	**1,039,920**	2,821,301
Deferred income tax (Note 31)	**(2,969,675)**	(658,128)
Total	**(1,929,755)**	2,163,173

No Hong Kong profits tax has been provided as there were no estimated assessable profits in Hong Kong for the year (2020: Nil).

The Company and its PRC branches and subsidiaries are subject to income tax at 25%, except for certain PRC branches and subsidiaries that are tax exempted or taxed at preferential tax rates, as determined in accordance with the relevant PRC income tax rules and regulations for the years ended 31 December 2021 and 2020.

The income tax rate applicable to Singapore subsidiaries is 17% (2020: 17%). The Company's overseas subsidiary in Pakistan is engaged in the power generation business is entitled to an income tax exemption according to Income Tax Ordinance 2001. Another subsidiary located in Pakistan engaged in the provision of maintenance services. Before 1 July 2019, the subsidiary's tax liability would be calculated at the highest of (i) normal tax at the rate of 29% of taxable income; (ii) Alternative Corporate Tax (ACT) at the rate of 17% of accounting profit; and (iii) minimum tax deductible at 8% of the revenue. If the income tax calculated is above normal tax at the rate of 29%, it would be carried forward to subsequent years for settlement against the liabilities of following years. The carry forward time period is 5 years in the case of minimum tax and 10 years in the case of ACT. However, from 1 July 2019, if the minimum tax liability is above the normal tax calculated, it cannot be carried forward to subsequent years.

33 INCOME TAX EXPENSE *(Cont'd)*

The reconciliation of the effective income tax rate from the notional income tax rate is as follows:

	For the year ended 31 December	
	2021	2020
PRC statutory enterprise income tax rate	**25.00%**	25.00%
Effect of different tax rates of certain subsidiaries	**5.80%**	(13.88%)
Utilisation of previously unrecognised tax losses and deductible temporary differences	**1.97%**	(5.50%)
Unrecognised tax losses for the year	**(16.99%)**	12.99%
Unrecognised deductible temporary differences	**(3.16%)**	26.17%
Effect of non-taxable income	**1.04%**	(9.34%)
Effect of non-deductible expenses	**(1.06%)**	8.70%
Others	**0.16%**	1.17%
Effective tax rate	**12.76%**	45.31%

For the year ended 31 December 2021, the effective tax rate was proportioned by income tax credit to loss before tax (for the year ended 31 December 2021: income tax expense to profit before tax).

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

34 (LOSSES)/EARNINGS PER SHARE

The basic earnings per share is calculated by dividing the consolidated net profit attributable to the equity holders of the Company excluding cumulative distribution of other equity instruments by the weighted average number of the Company's outstanding ordinary shares during the year:

	For the year ended 31 December	
	2021	2020
Consolidated net (loss)/profit attributable to equity holders of the Company	**(10,636,194)**	2,377,851
Less: cumulative distribution of other equity instruments	**2,137,420**	1,770,469
Consolidated net (loss)/profit attributable to ordinary shareholders of the Company	**(12,773,614)**	607,382
Weighted average number of the Company's outstanding ordinary shares ('000) *	**15,698,093**	15,698,093
Basic and diluted (loss)/earnings per share (RMB)	**(0.81)**	0.04

* Weighted average number of ordinary shares:

	2021 '000	2020 '000
Issued ordinary shares at 1 January	**15,698,093**	15,698,093
Weighted average number of ordinary shares at 31 December	**15,698,093**	15,698,093

There was no dilutive effect on earnings per share since the Company had no dilutive potential ordinary shares for the years ended 31 December 2021 and 2020.

35 NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS

Bank balances and cash comprise the following:

	As at 31 December	
	2021	2020
Total bank balances and cash	**16,350,332**	13,871,523
Less: Restricted cash	**795,507**	613,631
Cash and cash equivalents as at year end	**15,554,825**	13,257,892

The bank balances and cash of the Group are denominated in the following currencies:

	As at 31 December	
	2021	2020
RMB	**14,157,467**	12,200,948
S$ (RMB equivalent)	**698,923**	776,703
US$ (RMB equivalent)	**1,338,238**	462,560
Others	**155,704**	431,312
Total	**16,350,332**	13,871,523

During the year, the Group had non-cash additions to right-of-use assets and lease liabilities of RMB3,194 million and RMB3,194 million, respectively, in respect of lease arrangements (2020: RMB2,053 million and RMB2,053 million).

The table below details changes in the Group's liabilities from financing activities, including both cash and non-cash changes. Liabilities arising from financing activities are liabilities for which cash flows were, or future cash flows will be, classified in the Group's consolidated statement of cash flows as cash flows from financing activities:

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

35 NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS *(Cont'd)*

Items	Loans (Notes 24, 30)	Bonds (Notes 25, 29)	Cumulative distribution of other equity instruments (Note 21)	Lease liabilities (Note 41)	Dividends payable
As at 1 January 2021	198,196,868	38,063,793	411,458	5,482,346	694,854
(a) Business combination	–	–	–	–	–
(b) Changes from financing cash flows:					
Proceeds from new bank loans	201,881,272	–	–	–	–
Repayment of bank loans	(153,146,075)	–	–	–	–
Proceeds from new bonds	–	58,880,393	–	–	–
Repayment of bonds	–	(52,000,000)	–	–	–
Payment of lease liabilities	–	–	–	(1,860,532)	–
Interest paid	(8,694,150)	(1,440,844)	(2,139,222)	–	–
Dividends paid to shareholders of the Company	–	–	–	–	(2,825,657)
Dividends paid to non-controlling interests of the subsidiaries	–	–	–	–	(673,859)
Others	–	(16,070)	–	–	–
(c) Exchange adjustments	(515,687)	(168,214)	–	(58,294)	–
(d) Other changes:					
New leases	–	–	–	3,193,836	–
Interest expenses	7,154,229	1,475,918	–	168,053	–
Accrued cumulative distribution of other equity instrument investments	–	–	2,137,420	–	–
Capitalised borrowing costs	1,091,783	–	–	206,191	–
2020 dividends	–	–	–	–	3,846,114
Early termination of lease	–	–	–	(192,233)	–
As at 31 December 2021	245,968,240	44,794,976	409,656	6,939,367	1,041,452

35 NOTES TO CONSOLIDATED STATEMENT OF CASH FLOWS *(Cont'd)*

Items	Loans (Notes 24, 30)	Bonds (Notes 25, 29)	Accrued interest	Cumulative distribution of other equity instruments (Note 21)	Lease liabilities (Note 41)	Dividends payable
As at 1 January 2020	201,142,080	40,312,458	1,276,703	77,106	4,712,670	1,191,036
(a) Business combination	878,997	–	–	–	91,595	–
(b) Changes from financing cash flows:						
Proceeds from loans	168,677,805	–	–	–	–	–
Repayment of loans	(171,947,870)	–	–	–	–	–
Proceeds from new bonds	–	24,217,730	–	–	–	–
Repayment of bonds	–	(26,800,000)	–	–	–	–
Payment of lease liabilities	–	–	–	–	(1,297,746)	–
Interest paid	(7,976,843)	(896,587)	(1,276,703)	(1,436,117)	–	–
Dividends paid to shareholders of the Company	–	–	–	–	–	(2,119,243)
Dividends paid to non-controlling interests of the subsidiaries	–	–	–	–	–	(1,702,511)
Others	–	(35,283)	–	–	–	–
(c) Exchange adjustments	(847,434)	(305,256)	–	–	(66,099)	–
(d) Other changes:						
New leases	–	–	–	–	2,201,755	–
Interest expenses	7,415,824	1,582,524	–	–	202,264	–
Accrued cumulative distribution of other equity instrument investments	–	–	–	1,770,469	–	–
Capitalised borrowing costs	854,309	–	–	–	73,546	–
2019 dividends	–	–	–	–	–	3,325,572
Early termination of lease	–	–	–	–	(348,242)	–
Other	–	(11,793)	–	–	(87,397)	–
As at 31 December 2020	198,196,868	38,063,793	–	411,458	5,482,346	694,854

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

35 NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS *(Cont'd)*

The total cash outflow for leases included in the consolidated statement of cash flows is as follows:

	For the year ended 31 December	
	2021	2020
Within financing activities*	**1,860,532**	1,297,746
Total	**1,860,532**	1,297,746

* During the year, the principal portion of lease liabilities paid was RMB1,486 million (2020: RMB1,022 million).

36 RELATED PARTY BALANCES AND TRANSACTIONS

The related parties of the Group that had transactions with the Group are as follows:

Names of related parties	Nature of relationship
Huaneng Group	Ultimate parent company
HIPDC	Parent company
Huaneng Group Fuel Company and its subsidiaries	An associate of the Company and also a subsidiary of Huaneng Group
Huaneng Finance	An associate of the Company and also a subsidiary of Huaneng Group
Huaneng Clean Energy Research Institute	An associate of the Company and also a subsidiary of Huaneng Group
Huaneng Changjiang Environmental Protection Technology Co., Ltd.	An associate of the Company and also a subsidiary of Huaneng Group
Hanfeng Power	An associate of the Company and also a subsidiary of Huaneng Group
Huaneng (Tianjin) Coal Gasification Power Generation Co., Ltd.	An associate of the Company and also a subsidiary of Huaneng Group
Huaneng Xiapu Nuclear Power Co., Ltd.	An associate of the Company and also a subsidiary of Huaneng Group
Huaneng Shidao Bay Nuclear Power Development Co., Ltd.	An associate of the Company and also a subsidiary of Huaneng Group
Tiancheng Financial Leasing	An associate of the Company and also a subsidiary of Huaneng Group
Shanxi Lu'an Group Zuoquan Wulihou Coal Industry Co., Ltd.	An associate of the Company
Chongqing Luoyu Environmental Protection Technology Co., Ltd.	An associate of the Company
Suzhou Sugao Renewables Service Co. Ltd.	An associate of the Company

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

The related parties of the Group that had transactions with the Group are as follows: *(Cont'd)*

Names of related parties	Nature of relationship
Shanghai Time Shipping	A joint venture of the Company
Huaneng Yingkou Port Limited Liability Company	A joint venture of the Company
Jiangsu Nantong Power	A joint venture of the Company
Yantai Gangneng Bulk Cargo Terminal Co., Ltd.	A joint venture of the Company
Shandong Luyi Power International Limited Company	A joint venture of the Company
Huaneng (Zhangzhou, Fujian) Energy Co., Ltd.	A joint venture of the Company
Jining Huayuan Thermal Power Co., Ltd.	A joint venture of the Company
Huaneng Renewables Corporation Limited	Subsidiaries of Huaneng Group
Huaneng Nuclear Power Development Co., Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Energy & Communications Holdings Co., Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Coal Business Sector Co., Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Capital Services and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Group Technology Innovation Center	A subsidiary of Huaneng Group
Huaneng Real Estate Co., Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
North United Power Corporation and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Lancangjiang Hydropower Co., Inc. and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Inner Mongolia Eastern Energy Co., Ltd and its subsidiaries	Subsidiaries of Huaneng Group
Sichuan Energy Development and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Shanxi Power Generation Limited and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Ningxia Energy Company Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Gansu Energy Development Company Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Tibet Yarlung Zangbo River Hydropower Development & Investment Company Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
China Hua Neng Group Hong Kong Limited and its subsidiaries	Subsidiaries of Huaneng Group
Xi'an Thermal Power Research Institute Co., Ltd. and its subsidiaries	Subsidiaries of Huaneng Group
Hong Kong Asset Management	Subsidiaries of Huaneng Group
Huaneng Integrated Industry Co., Ltd and its subsidiaries	Subsidiaries of Huaneng Group
Tianjin Huaneng Yangliuqing Thermal Power Industrial Co., Ltd and its subsidiaries	Subsidiaries of Huaneng Group

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

The related parties of the Group that had transactions with the Group are as follows: *(Cont'd)*

Names of related parties	Nature of relationship
Huaneng Gongrong No.1 (Tianjin) Equity Investment Fund Partnership (Limited Partnership) and its subsidiaries	Subsidiaries of Huaneng Group
Huaneng Songyuan Power Co., Ltd.	A subsidiary of Huaneng Group
Huaneng Tendering Co., Ltd.	A subsidiary of Huaneng Group
Huaneng Caofeidian Port Co., Ltd	A subsidiary of Huaneng Group
Beijing Changping Huaneng Training Center	A subsidiary of Huaneng Group
Huaneng Overseas Enterprise Management Limited	A subsidiary of Huaneng Group
Huaneng (Dalian) Energy And Heat Co., Ltd	A subsidiary of Huaneng Group
Huaneng Nuclear Technology Research Institute Co., Ltd	A subsidiary of Huaneng Group
Huangtai #8 Power Plant	An investee with 30% equity interests
Other government-related enterprises**	Related parties of the Company

* Transactions with subsidiaries of Huaneng Group which also are associates of the Group are presented as transactions with subsidiaries of Huaneng Group for Note 36(a) and 36(b).

** Huaneng Group is a state-owned enterprise. In accordance with the revised IAS 24 Related Party Disclosures, government-related enterprises, other than entities under Huaneng Group, over which the PRC government has control, joint control or significant influence, are also considered as related parties of the Group ("other government-related enterprises").

The majority of the business activities of the Group are conducted with other government-related enterprises. For the purpose of the disclosure of the related party balances and transactions, the Group has established procedures to determine, to the extent possible, the identification of the ownership structure of its customers and suppliers as to whether they are government-related enterprises. However, many government-related enterprises have a multi-layered corporate structure and the ownership structures change over time as a result of transfers and privatisation programs. Nevertheless, management believes that all material related party balances and transactions with other government-related enterprises have been adequately disclosed.

In addition to the related party information shown elsewhere in these financial statements, the following is a summary of significant related party transactions entered into in the ordinary course of business between the Group and their related parties during the year and significant balances arising from related party transactions as at the year end.

All transactions with related parties were conducted at prices and on terms mutually agreed by the parties involved, and are based on normal commercial terms or better and with reference to the prevailing local market conditions.

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(a) Related party balances

(i) Cash deposits in related parties

	As at 31 December	
	2021	2020
Deposits in Huaneng Finance – Savings deposits	**13,372,802**	10,596,255

For the year ended 31 December 2021, the annual interest rates for these savings deposits (as included in bank balances and cash) ranged from 0.35% to 1.49% (2020: from 0.35% to 1.49%).

(ii) As described in Notes 24 and 30, certain loans of the Group were borrowed from Huaneng Group, Huaneng Finance, Tiancheng Financial Leasing and Hong Kong Asset Management.

(iii) Except for those disclosed in Notes 24 and 30, the majority of the balances with Huaneng Group, HIPDC, subsidiaries of Huaneng Group, associates, joint ventures and other related parties are unsecured and repayable within one year. As at and for the years ended 31 December 2021 and 2020, no provision was made on receivable balances from these parties.

Accounts receivable, other receivables and assets, property, plant and equipment and other non-current assets comprise the following balances due from related parties:

	As at 31 December	
	2021	2020
Due from Huaneng Group	**53,838**	36,683
Due from HIPDC	**301**	–
Due from associates	**97,796**	–
Due from joint ventures	**301,181**	390,324
Due from subsidiaries of Huaneng Group	**916,107**	156,422
Due from Huangtai #8 Power Plant*	**896,118**	775,109
Total	**2,265,341**	1,358,538

* Please refer to Note 15 for details of the provision of Huangtai #8 Power Plant.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(a) Related party balances *(Cont'd)*

(iv) Accounts payable and other liabilities, lease liabilities and other non-current liabilities comprise the following balances due to related parties:

	As at 31 December	
	2021	2020
Due to Huaneng Group	**99,824**	382,571
Due to HIPDC	**14,096**	13,788
Due to associates	**3,616**	–
Due to joint ventures	**144,887**	150,357
Due to subsidiaries of Huaneng Group	**18,693,797**	9,730,905
Total	**18,956,220**	10,277,621

(v) As at 31 December 2021, included in long-term loans (including current portion) and short-term loans are loans payable to other government-related financial institutions amounting to RMB224.9 billion (2020: RMB196.9 billion).

The balances with government-related enterprises also included substantially all the accounts receivable due from domestic power plants of government-related power grid companies, the bank deposits placed with government-related financial institutions as well as accounts payable and other payables arising from the purchases of coal and property, plant and equipment construction and related labour services provided by other government-related enterprises. Except for bank deposits, these balances are unsecured and the majority of the balances are receivable/repayable within one year.

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(b) Related party transactions

(i) Procurement of goods and receiving services

	For the year ended 31 December	
	2021	2020
Huaneng Group		
Other purchases	**499**	415
Subsidiaries of Huaneng Group		
Purchase of coal and transportation services	**78,459,308**	35,412,425
Technical services and engineering contracting services	**2,206,084**	1,445,088
Purchase of equipment	**571,014**	378,382
Purchase of heat	**56,677**	45,520
Other purchases	**42,991**	51,240
Joint ventures of the Group		
Purchase of coal and transportation services	**624,477**	522,570
Entrusting other parties for power generation	**–**	23,611
Associates of the Group		
Purchase of equipment	**–**	27,241
Purchase of coal and transportation services	**18,040**	204,419

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(b) Related party transactions *(Cont'd)*

(ii) Sales of goods and providing services

	For the year ended 31 December	
	2021	2020
Huaneng Group		
Services provided	**107,726**	77,462
HIPDC		
Services provided	**529**	370
Subsidiaries of Huaneng Group		
Service provided	**249,702**	134,111
Sales of heat	**56,122**	–
Other sales	**4,380**	48,574
Sales of coal	**104,017**	–
Joint ventures of the Group		
Service provided	**97,265**	82,229
Other sales	**16,220**	8,404
Associates of the Group		
Other sales	**33,919**	–

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(b) Related party transactions *(Cont'd)*

(iii) Other related party transactions

	For the year ended 31 December	
	2021	2020
(1) Rental charge paid		
HIPDC	**56,477**	104,696
Subsidiaries of Huaneng Group	**171,347**	218,463
Huaneng Group	**–**	57
(2) Rental income received		
A joint venture of the Group	**6,612**	8,659
Subsidiaries of Huaneng Group	**4,938**	1,978
Huangtai #8 Power Plant	**17,594**	19,689
(3) Net loans received from/(repaid to)		
Huaneng Group	**3,166,000**	–
Subsidiaries of Huaneng Group	**940,550**	2,789,776
(4) Interest expense on loans		
Huaneng Group	**68,135**	30,306
A joint venture of the Group	**5,402**	6,591
Subsidiaries of Huaneng Group	**549,502**	552,565
(5) Interest income on loans		
Joint ventures of the Group	**5,091**	4,339
(6) Provision of entrusted loans		
A joint venture of the Group	**75,000**	224,000
(7) Recover the entrusted loans		
A joint venture of the Group	**304,000**	–

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(b) Related party transactions *(Cont'd)*

(iii) Other related party transactions *(Cont'd)*

	For the year ended 31 December	
	2021	2020
(8) Capital injection from a subsidiary of Huaneng Group		
Subsidiaries of Huaneng Group	**218,046**	278,073
(9) Capital injection to		
Subsidiaries of Huaneng Group	**454,117**	94,500
Associates of the Group	**316,606**	185,261
Joint ventures of the Group	**81,600**	317,116
(10) Entrusted management fee		
Huaneng Group	**14,800**	14,370
(11) Trusteeship management income		
Huaneng Group	**5,226**	4,822
Huangtai #8 Power Plant	**1,962**	3,240
(12) Net operating advances (paid to)/received from an investee with 30% equity interests		
Huangtai #8 Power Plant	**(240,271)**	9,822
(13) Profit compensation received		
Huaneng Group	**–**	457,727
(14) Acquisition consideration		
Subsidiaries of Huaneng Group	**–**	237,228

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(b) Related party transactions *(Cont'd)*

Transactions with government-related enterprises

For the years ended 31 December 2021 and 2020, apart from the overseas segment, the Group sold substantially all its products to local government-related power grid companies. Please refer to Note 5 for details of sales information to major power grid companies.

For the years ended 31 December 2021 and 2020, other collectively-significant transactions with government-related enterprises also included a large portion of domestic fuel purchases, property, plant and equipment construction and related labour employed.

(c) Balance of guarantees

	As at 31 December	
	2021	2020
Long-term loans guaranteed by		
– Huaneng Group	**43,555**	1,407,338
Short-term loans guaranteed by		
– Joint ventures of the Group	**148,256**	–

(d) Pre-tax benefits and social insurance of key management personnel

	For the year ended 31 December	
	2021	2020
Salaries	**9,333**	9,373
Pension	**1,616**	1,329
Total	**10,949**	10,702

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(e) Related party commitments

Related party commitments which were contracted but not recognised in the consolidated statement of financial position as at the end of the reporting period are as follows:

(i) Capital commitments

	As at 31 December	
	2021	2020
Subsidiaries of Huaneng Group	**1,044,526**	1,947,988

(ii) Fuel purchase and transportation commitments

	As at 31 December	
	2021	2020
Subsidiaries of Huaneng Group	**5,149,896**	1,519,364
A joint venture of the Group	**16,921**	131,810

(f) Applicability of the Listing Rules relating to connected transactions

The related party transactions with HIPDC, Huaneng Group and its subsidiaries in respect of the purchase of coal and transportation services, equipment, technical services and engineering contracting services, leasing rental and interest expenses incurred by the Group as disclosed in Note 36(b) constitute connected transactions or continuing connected transactions as defined in Chapter 14A of the Listing Rules. The disclosures required by Chapter 14A of the Listing Rules are included in the section "Connected transactions" of the Directors' Report of the Group for the year ended 31 December 2021.

37 LABOUR COST

Other than the salaries and staff welfare, the labour cost of the Group mainly comprises the following:

All PRC employees of the Group are entitled to a monthly pension upon their retirement. The PRC government is responsible for the pension liability to these employees on retirement. The Group is required to make contributions to the publicly administered retirement plan for its PRC employees at a specified rate, currently set at 14% to 20% (2020: 14% to 20%) of the basic salary of the PRC employees. In 2020, affected by the Covid-19 pandemic, the government has temporarily reduced the employee social benefit expenditures of entities in the PRC for a certain period time based on the severity of the pandemic in different regions. The retirement plan contributions paid by the Group for the year ended 31 December 2021 were approximately RMB1,419 million (2020: RMB507 million), including approximately RMB1,368 million (2020: RMB481 million) charged to profit or loss.

In addition, the Group has also implemented a supplementary defined contribution retirement scheme for PRC employees. Under this scheme, the employees are required to make a specified contribution based on the number of years of service with the Group, and the Group is required to make a contribution equal to two to four times the employees' contributions. The employees will receive the total contributions upon their retirement. For the year ended 31 December 2021, the contributions to the supplementary defined contribution retirement scheme paid by the Group amounted to approximately RMB828 million (2020: RMB698 million), including approximately RMB792 million (2020: RMB662 million) charged to profit or loss.

SinoSing Power and its subsidiaries in Singapore appropriate at a specified rate, currently set at 7.5% to 17% (2020: 7.5% to 17%) of the basic salary to central provident funds in accordance with the local government regulations. The contributions made by SinoSing Power and its subsidiaries for the year ended 31 December 2021 amounted to approximately RMB24.16 million (2020: RMB23.07 million), all of which were charged to profit or loss.

The Group has no further obligation for post-retirement benefits beyond the annual contributions made above.

In addition, the Group also makes contributions of housing funds and social insurance to the social security institutions at specified rates of the basic salary and no more than the upper limit. The housing funds and social insurance contributions paid by the Group amounted to approximately RMB1,210 million (2020: RMB1,024 million) and RMB1,326 million (2020: RMB1,034 million) for the year ended 31 December 2021 including approximately RMB1,151 million (2020: RMB954 million) and RMB1,283 million (2020: RMB976 million) charged to profit or loss, respectively.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

38 DIRECTORS', SUPERVISORS' AND SENIOR MANAGEMENT'S EMOLUMENTS

(a) Pre-tax benefits and social insurance of directors and supervisors

The remuneration of every director and supervisor of the Company for the year ended 31 December 2021 is set out below:

	Fees	Basic salaries	Performance bonuses	Pension	Total
Name of director					
Mr. Zhao Keyu[1]	–	249	856	175	1,280
Mr. Zhaoping[1]	–	249	851	171	1,271
Mr. Huang Jian	–	–	–	–	–
Mr. Wang Kui	–	–	–	–	–
Mr. Lu Fei	–	–	–	–	–
Mr. Teng Yu	–	–	–	–	–
Mr. Mi Dabin	–	–	–	–	–
Mr. Cheng Heng	–	–	–	–	–
Mr. Li Haifeng	–	–	–	–	–
Mr. Lin Chong	–	–	–	–	–
Mr. Xu Mengzhou	300	–	–	–	300
Mr. Liu Jizhen	300	–	–	–	300
Mr. Xu Haifeng	300	–	–	–	300
Mr. Zhang Xianzhi	300	–	–	–	300
Mr. Xia Qing	300	–	–	–	300
Sub-total	1,500	498	1,707	346	4,051
Name of supervisor					
Mr. Li Shuqing	–	–	–	–	–
Mr. Mu Xuan	–	–	–	–	–
Mr. Ye Cai[2]	–	–	–	–	–
Mr. Gu Jianguo	–	–	–	–	–
Ms. Zhang Xiaojun[3]	–	37	374	40	451
Mr. Xu Jianping	–	154	812	164	1,130
Mr. Zhu Tong[4]	–	77	332	77	486
Mr. Xia Aidong[5]	–	–	–	–	–
Sub-total	–	268	1,518	281	2,067
Total	1,500	766	3,225	627	6,118

38 DIRECTORS', SUPERVISORS' AND SENIOR MANAGEMENT'S EMOLUMENTS *(Cont'd)*

(a) Pre-tax benefits and social insurance of directors and supervisors *(Cont'd)*

The remuneration of every director and supervisor of the Company for the year ended 31 December 2020 is set out below:

	Fees	Basic salaries	Performance bonuses	Pension	Total
Name of director					
Mr. Zhao Keyu	–	215	836	135	1,186
Mr. Zhaoping	–	212	789	123	1,124
Mr. Huang Jian	–	–	–	–	–
Mr. Wang Kui	–	–	–	–	–
Mr. Lu Fei	–	–	–	–	–
Mr. Teng Yu	–	–	–	–	–
Mr. Mi Dabin	–	–	–	–	–
Mr. Cheng Heng	–	–	–	–	–
Mr. Li Haifeng	–	–	–	–	–
Mr. Lin Chong	–	–	–	–	–
Mr. Xu Mengzhou	300	–	–	–	300
Mr. Liu Jizhen	300	–	–	–	300
Mr. Xu Haifeng	300	–	–	–	300
Mr. Zhang Xianzhi	300	–	–	–	300
Mr. Xia Qing	150	–	–	–	150
Mr. Shu Yinbiao[6]	–	–	–	–	–
Mr. Wang Yongxiang[7]	–	–	–	–	–
Mr. Guo Hongbo[8]	–	–	–	–	–
Mr. Yue Heng[7]	150	–	–	–	150
Sub-total	1,500	427	1,625	258	3,810
Name of supervisor					
Mr. Li Shuqing	–	–	–	–	–
Mr. Mu Xuan	–	–	–	–	–
Mr. Ye Cai	–	–	–	–	–
Mr. Gu Jianguo	–	–	–	–	–
Ms. Zhang Xiaojun	–	150	761	122	1,033
Mr. Xu Jianping	–	79	357	77	513
Mr. Ye Xiangdong[7]	–	–	–	–	–
Ms. Zhang Mengjiao[7]	–	–	–	–	–
Mr. Zhang Xiancheng[7]	–	75	408	55	538
Sub-total	–	304	1,526	254	2,084
Total	1,500	731	3,151	512	5,894

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

38 DIRECTORS', SUPERVISORS' AND SENIOR MANAGEMENT'S EMOLUMENTS *(Cont'd)*

(a) Pre-tax benefits and social insurance of directors and supervisors *(Cont'd)*

1 Remuneration for the whole year ended 31 December 2021

2 Appointed on 16 June 2020 and resigned on 22 June 2021

3 Resigned on 9 June 2021

4 Appointed on 9 June 2021

5 Appointed on 22 June 2021

6 Resigned on 5 March 2020

7 Resigned on 16 June 2020

8 Resigned on 22 December 2020

During the year, no option was granted to the directors or the supervisors (2020: nil).

During the year, no emolument was paid to the directors or the supervisors (including the five highest paid employees) as an inducement to join or upon joining the Company or as compensation for loss of office (2020: nil).

No director or supervisor had waived or agreed to waive any emoluments during the years 2021 and 2020.

(b) Five highest paid individuals

The five individuals whose emoluments were the highest in the Group for the year included two directors (2020: two directors). Directors' emoluments are reflected in the analysis presented above. The emoluments payable to the remaining three (2020: three) highest paid individuals during the year (within the range of nil to RMB1.130 million) are as follows:

	For the year ended 31 December	
	2021	2020
Basic salaries	**626**	552
Performance bonuses	**2,243**	2,167
Pension	**487**	376
	3,356	3,095

39 COMMITMENTS

(a) Capital commitments

Capital commitments mainly relate to the construction of new power projects, certain ancillary facilities and renovation projects for existing power plants. Details of such commitments are as follows:

	As at 31 December	
	2021	2020
Contracted, but not provided	25,770,547	35,652,079

(b) Fuel purchase commitments

As at 31 December 2021, the Group has entered into major fuel purchase commitment amounting to approximately RMB16.248 billion (31 December 2020: RMB5.773 billion).

The Group has entered into various long-term fuel supply agreements with various suppliers in securing fuel supply for various periods. All the agreements require minimum, maximum or forecasted volume purchases and subject to certain termination provisions. Related purchase commitments are as follows:

	As at 31 December 2021		
	Periods	Purchase quantities	Estimated unit costs (RMB)
A government-related enterprise	2022-2039	2.8 million m3/year*	2.12/m^3
A government-related enterprise	2022-2023	518 million m3/year*	2.67/m^3
	2022-2023	541 million m3/year*	2.49/m^3
	2022-2023	459 million m3/year*	2.65/m^3
A government-related enterprise	2022-2026	222 million m3/year*	2.49/m^3
Other suppliers	2022	199.02-249.02BBtu**/day	approximately 66,000/Bbtu
	2023	233.11-239.77BBtu**/day	approximately 64,000/BBtu
	2024-2028	42.4-239.02 BBtu**/day	approximately 70,000/BBtu
	2029	42.4 BBtu**/day	approximately 46,000/BBtu

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

39 COMMITMENTS *(Cont'd)*

(b) Fuel purchase commitments *(Cont'd)*

	As at 31 December 2020		
	Periods	Purchase quantities	Estimated unit costs (RMB)
A government-related enterprise	2021-2039	2.8 million m3/day*	2.37/m^3
A government-related enterprise	2021-2023	991 million m3/year*	2.18/m^3
	2021-2023	541 million m3/year*	2.52/m^3
	2021-2023	450 million m3/year*	2.11/m^3
A government-related enterprise	2021-2026	222 million m3/year*	2.22/m^3
	2021	40 million m3/year*	1.86/m^3
Other suppliers	2021	201.5-251.5 BBtu**/day	approximately 48,000/BBtu
	2022	205.5-255.5 BBtu**/day	approximately 47,000/BBtu
	2023	81.5-247.5 BBtu**/day	approximately 42,000/BBtu
	2024-2028	42.4-81.5 BBtu**/day	approximately 38,000/BBtu
	2029	42.4 BBtu**/day	approximately 28,000/BBtu

* The quantities represent the maximum volume, while others represent the minimum or forecasted volume if not specified.

** BBtu: Billion British Thermal Unit

40 NON-CONTROLLING INTERESTS

The following table summarises the information relating to each subsidiary of the Group that has material non-controlling interests ("NCI"):

	Qinbei Power	Beijing Co-generation	Luohuang Power	Weihai Power	Jinling Power	Yueyang Power	Shidongkou Power	Yangliuqing Co-generation	Shandong Power	Other individually immaterial subsidiaries	Total
NCI percentage	40%	59%	40%	40%	40%	45%	50%	45%	20%		
31 December 2021											
Non-current assets	7,660,162	5,686,700	3,088,192	3,902,465	3,908,144	4,106,929	2,735,098	2,373,588	57,642,724		
Current assets	1,573,974	1,195,667	2,138,766	1,184,868	1,018,851	1,542,688	631,141	756,266	17,980,662		
Non-current liabilities	(3,111,321)	(56,954)	(437,677)	(277,371)	(663,888)	(636,817)	(254,041)	(480,591)	(28,806,987)		
Current liabilities	(3,823,898)	(1,006,493)	(2,175,136)	(2,926,984)	(2,542,203)	(3,305,250)	(1,687,220)	(1,141,814)	(37,586,347)		
Net assets	2,298,917	5,818,920	2,614,145	1,882,978	1,720,904	1,707,550	1,424,978	1,507,449	9,230,052		
Carrying amount of NCI	933,483	3,433,194	1,024,640	753,191	688,383	784,242	712,489	677,457	4,178,519	7,324,601	20,510,199
Revenue	4,497,186	5,908,637	4,004,278	3,469,169	3,727,938	4,653,947	2,697,730	1,967,143	31,721,970		
Net (loss)/profit	(871,797)	616,965	193,829	(632,680)	(337,884)	(860,087)	(116,599)	(511,712)	(3,174,430)		
Total comprehensive (loss)/income	(871,797)	616,965	193,829	(632,680)	(337,884)	(860,087)	(116,599)	(511,712)	(3,646,414)		
(Loss)/profit allocated to NCI	(348,719)	364,009	77,532	(253,072)	(135,154)	(387,039)	(58,300)	(230,270)	(634,886)	(948,796)	(2,554,695)
Other comprehensive loss allocated to NCI	–	–	–	–	–	–	–	–	(94,397)	(169,611)	(264,008)
Cash flows from operating activities	160,762	878,621	(241,500)	(654,374)	(246,035)	(1,346,417)	(68,346)	(550,690)	(1,252,827)		
Cash flows from investing activities	(171,726)	(408,692)	25,936	(339,557)	(117,909)	(117,553)	(28,638)	(100,600)	(5,794,380)		
Cash flows from financing activities	245,125	(487,176)	246,075	959,606	381,281	1,121,165	77,909	633,699	7,195,987		
Net increase/(decrease) in cash and cash equivalents	234,161	(17,247)	30,511	(34,325)	17,337	(342,805)	(19,075)	(17,591)	148,780		
Dividends paid to NCI	–	278,013	30,000	99,850	113,803	–	128,120	–	107,686		

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

40 NON-CONTROLLING INTERESTS *(Cont'd)*

The following table summarises the information relating to each subsidiary of the Group that has material non-controlling interests ("NCI"): (Cont'd)

	Qinbei Power	Beijing Co-generation	Luohuang Power	Weihai Power	Jinling Power	Yueyang Power	Shidongkou Power	Yangliuqing Co-generation	Shandong Power	Other individually immaterial subsidiaries	Total
NCI percentage	40%	59%	40%	40%	40%	45%	50%	45%	20%		
31 December 2020											
Non-current assets	8,218,373	5,849,233	3,316,087	3,709,929	4,088,251	4,074,135	2,978,015	2,449,103	52,936,475		
Current assets	1,334,506	1,125,151	1,241,707	637,757	576,992	1,264,211	418,832	610,494	11,381,268		
Non-current liabilities	(1,355,645)	(68,685)	(189,516)	(119,088)	(694,913)	(659,387)	(529,136)	(197,615)	(25,501,838)		
Current liabilities	(5,026,519)	(1,232,536)	(1,872,962)	(1,463,315)	(1,627,035)	(2,112,026)	(1,069,893)	(842,820)	(26,380,853)		
Net assets	3,170,715	5,673,163	2,495,316	2,765,283	2,343,295	2,566,933	1,797,818	2,019,162	12,435,052		
Carrying amount of NCI	1,282,201	3,347,198	977,108	1,106,113	937,340	1,171,281	898,909	907,727	4,596,984	6,545,414	21,770,275
Revenue	4,472,279	5,607,020	2,703,231	2,775,206	3,168,617	3,591,193	2,178,367	1,846,175	26,904,777		
Net (loss)/profit	(78,226)	505,190	77,521	83,607	315,837	294,258	355,890	32,950	(4,014,417)		
Total comprehensive (loss)/income	(78,226)	505,190	77,521	83,607	315,837	294,258	355,890	32,950	(4,313,258)		
(Loss)/profit allocated to NCI	(31,290)	298,062	31,008	33,443	126,335	132,416	177,945	14,828	(802,883)	252,848	232,712
Other comprehensive loss allocated to NCI	–	–	–	–	–	–	–	–	(59,769)	(132,889)	(192,658)
Cash flows from operating activities	1,302,559	1,037,909	575,857	608,917	706,320	1,151,257	736,958	329,025	7,836,378		
Cash flows from investing activities	(234,425)	(421,456)	(137,178)	(61,691)	(100,610)	13,049	(38,695)	(80,191)	(4,652,029)		
Cash flows from financing activities	(1,029,306)	(704,705)	(403,026)	(519,433)	(645,027)	(714,838)	(719,372)	(256,335)	(3,179,760)		
Net increase/(decrease) in cash and cash equivalents	38,828	(88,252)	35,653	27,793	(39,317)	449,468	(21,109)	(7,501)	4,589		
Dividends paid to NCI	–	376,787	40,000	–	95,666	185,661	113,705	–	101,296		

41 LEASES

The Group as a lessee

(a) Right-of-use assets

The carrying amounts of the Group's right-of-use assets and the movements during the year are as follows:

	Right-of-use assets					
	Buildings	Electric utility plant in service	Transportation facilities	Land use rights*	Others	Total
As at 1 January 2021	290,895	4,490,469	180,717	12,846,552	483,441	18,292,074
Additions	57,722	1,853,135	110,215	864,204	531,130	3,416,406
Depreciation charge	(91,663)	(294,183)	(10,014)	(509,762)	(28,258)	(933,880)
Disposals/write-off	–	(340)	–	(113,993)	(21,279)	(135,612)
Early termination	(27,158)	(892,896)	–	(53,943)	–	(973,997)
Currency translation differences	(915)	(2,392)	(17,401)	(40,356)	–	(61,064)
As at 31 December 2021	228,881	5,153,793	263,517	12,992,702	965,034	19,603,927
As at 1 January 2020	143,314	3,800,493	206,421	12,553,477	464,367	17,168,072
Additions	255,030	1,453,919	–	621,787	69,903	2,400,639
Business combination	–	–	–	122,872	–	122,872
Depreciation charge	(97,483)	(228,539)	(7,021)	(431,476)	(48,705)	(813,224)
Disposals/write-off	–	(7,589)	–	(4,241)	–	(11,830)
Early termination	(8,570)	(497,815)	–	–	(216)	(506,601)
Reclassification	–	(26,698)	–	28,606	(1,908)	–
Currency translation differences	(1,396)	(3,302)	(18,683)	(44,473)	–	(67,854)
As at 31 December 2020	290,895	4,490,469	180,717	12,846,552	483,441	18,292,074

* Land use rights without ownership certificates

As at 31 December 2021, the Group was in the process of applying for the ownership certificates for certain land use rights with an aggregate net book value of RMB71.63 million (2020: RMB161 million). Management is of the opinion that the Group is entitled to the lawful and valid occupation and use of the abovementioned land. There have been no litigations, claims or assessments against the Group for compensation with respect to the use of these land use rights as at the date of approval of these financial statements.

As at 31 December 2021, certain land use right with net book value of RMB17 million (31 December 2020: nil) was in a state of seizure due to pre-litigation preservation.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

41 LEASES *(Cont'd)*

The Group as a lessee *(Cont'd)*

(b) Lease liabilities

The carrying amount of lease liabilities and the movements during the year are as follows:

	As at 31 December	
	2021	2020
Carrying amount at 1 January	**5,482,346**	4,712,670
New leases	**3,193,836**	2,201,755
Business combination	**–**	91,595
Accretion of interest recognised during the year	**374,244**	275,810
Currency translation differences	**(58,294)**	(66,099)
Payments	**(1,860,532)**	(1,385,143)
Early termination	**(192,233)**	(348,242)
Carrying amount at 31 December	**6,939,367**	5,482,346
Analysed into:		
Current portion	**800,521**	1,676,711
Non-current portion	**6,138,846**	3,805,635

The maturity profile of the Group's lease liabilities as at the end of the reporting period, based on the contractual undiscounted payments, is as follows:

	As at 31 December	
	2021	2020
Within 1 year	**1,026,900**	1,908,275
After 1 year but within 2 years	**1,624,435**	649,809
After 2 years but within 3 years	**602,623**	422,076
After 3 years	**5,656,876**	4,051,229
Subtotal	**8,910,834**	7,031,389
Unrecognised finance fees	**1,971,467**	1,549,043
Total	**6,939,367**	5,482,346

41 LEASES *(Cont'd)*

The Group as a lessee *(Cont'd)*

(b) Lease liabilities *(Cont'd)*

The amounts recognised in profit or loss in relation to leases are as follows:

	As at 31 December	
	2021	2020
Interest on lease liabilities	**169,696**	202,264
Depreciation charge of right-of-use assets	**749,383**	785,518
Expense relating to short-term leases	**111,886**	103,817
Expense relating to leases of low-value assets	**3,023**	2,214
Total amount recognised in profit	**1,033,988**	1,093,813

(c) Extension and termination options

The Group has several lease contracts that include extension and termination options. These options are negotiated by management to provide flexibility in managing the leased-asset portfolio and they are aligned with the Group's business needs. As at 31 December 2021, there were neither extension options that the Group does not expect to exercise nor significant termination options that the Group expects to exercise.

(d) Variable lease payments

The Group does not have variable lease payments that depend on an index or a rate, and amounts expected to be paid under residual value guarantees.

(e) The total cash outflow for leases is disclosed in Note 35 to these financial statements.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

41 LEASES *(Cont'd)*

The Group as a lessor

(a) Finance lease

The Group's finance lease is mainly related to Ruyi Rakistan Energy, SinoSing Power and Shandong Maintenance Company.

Ruyi Rakistan Energy entered into a power purchase agreement with CPPA-G to sell all of the electricity produced with a regulated tariff mechanism approved by the Pakistan National Electric Power Regulatory Authority. In accordance with the power purchase agreement and tariff mechanism, almost all the risks and rewards in relation to the power assets were in substance transferred to CPPA-G and therefore the assets were accounted for as a finance lease to CPPA-G.

SinoSing Power's subsidiary, Tuas Group, entered into two build-to-suit agreements with third parties, which involve sale and leaseback arrangements and the provision of operation maintenance services.

Shandong Maintenance Company entered into the Energy Management Contract with Huangtai #8 Power Plant to provide energy saving equipment construction services. Pursuant to the agreement, all the risk and rewards in relation to the energy saving equipment were in substance transferred to Huangtai#8 Power Plant as the benefit could be reliably estimated during the contract period.

Total finance lease income recognised by the Group for the year ended 31 December 2021 was RMB1,325 million (2020: RMB1,544 million).

As at 31 December 2021, the maturity analysis of the Group's finance lease receivables is as follows:

	As at 31 December	
	2021	2020
Within 1 year	**1,872,397**	1,924,763
After 1 year but within 2 years	**1,883,028**	1,925,641
After 2 years but within 3 years	**1,893,937**	1,928,125
After 3 years but within 4 years	**1,900,892**	1,939,174
After 4 years but within 5 years	**1,922,609**	1,969,470
After 5 years	**15,585,762**	17,921,037
Total undiscounted finance lease payments	**25,058,625**	27,608,210
Unearned finance income	**(15,840,838)**	(17,694,886)
Allowance for ECL	**(2,643)**	(2,925)
Total finance lease receivables as at 31 December (note 15 and 17)	**9,215,144**	9,910,399

41 LEASES *(Cont'd)*

The Group as a lessor *(Cont'd)*

(b) Operating lease

The Group leases certain property, plant and equipment under operating lease arrangements. Rental income recognised by the Group for the year ended 31 December 2021 was RMB148 million (2020: RMB86 million).

As at 31 December 2020 and 2021, the undiscounted lease payments receivable by the Group in future periods under non-cancellable operating leases with its tenants are as follows:

	As at 31 December	
	2021	2020
Within 1 year	**108,066**	11,652
After 1 year but within 2 years	**2,378**	3,701
After 2 years but within 3 years	**781**	2,161
After 3 years but within 4 years	**546**	1,021
After 4 years but within 5 years	**193**	525
After 5 years	**398**	3,020
Total	**112,362**	22,080

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

42 STATEMENT OF FINANCIAL POSITION OF THE COMPANY

	As at 31 December	
	2021	2020
ASSETS		
Non-current assets		
Property, plant and equipment	**24,001,742**	23,992,866
Right-of-use assets	**1,169,101**	1,331,982
Investments in associates and joint ventures	**13,823,735**	14,219,665
Investments in subsidiaries	**124,925,251**	115,909,726
Loans to subsidiaries	**16,204,513**	14,152,513
Investment property	**146,456**	143,114
Other equity investment	**587,354**	589,208
Deferred income tax assets	**841,225**	638,287
Goodwill	**106,854**	106,854
Other non-current assets	**4,405,579**	2,341,202
Total non-current assets	**186,211,810**	173,425,417
Current assets		
Inventories	**2,451,370**	780,089
Other receivables and assets	**6,329,988**	12,787,986
Accounts receivable	**4,136,359**	4,385,701
Loans to subsidiaries	**1,978,006**	4,025,810
Bank balances and cash	**1,693,600**	968,344
Total current assets	**16,589,323**	22,947,930
Total assets	**202,801,133**	196,373,347
EQUITY AND LIABILITIES		
Capital and reserves attributable to equity holders of the Company		
Share capital	**15,698,093**	15,698,093
Capital surplus	**25,756,289**	25,791,551
Other equity instruments	**48,417,977**	48,419,779
Surplus reserves	**8,140,030**	8,140,030
Retained earnings	**23,305,617**	32,088,513
Total equity	**121,318,006**	130,137,966

42 STATEMENT OF FINANCIAL POSITION OF THE COMPANY *(Cont'd)*

	As at 31 December	
	2021	2020
EQUITY AND LIABILITIES (Cont'd)		
Non-current liabilities		
Long-term loans	**4,633,270**	2,917,306
Long-term bonds	**25,295,617**	16,497,017
Lease liabilities	**101,928**	238,812
Other non-current liabilities	**1,364,445**	572,103
Total non-current liabilities	**31,395,260**	20,225,238
Current liabilities		
Accounts payable and other liabilities	**5,594,662**	3,863,321
Contract liabilities	**400,474**	357,428
Taxes payable	**158,868**	73,207
Short-term bonds	**8,022,474**	5,002,877
Short-term loans	**26,614,872**	23,238,498
Current portion of long-term loans	**2,053,276**	682,520
Current portion of long-term bonds	**7,140,727**	12,643,014
Current portion of lease liabilities	**102,514**	149,278
Total current liabilities	**50,087,867**	46,010,143
Total liabilities	**81,483,127**	66,235,381
Total equity and liabilities	**202,801,133**	196,373,347

43 SUBSEQUENT EVENTS

Up to the annual report date, there was no material subsequent event.

These financial statements were approved for issue by the Board of Directors on 22 March 2022 and were signed on its behalf.

Zhao Keyu
Director

Zhao Ping
Director

RECONCILIATION OF FINANCIAL STATEMENTS BETWEEN PRC GAAP AND IFRS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

The financial statements, which have been prepared by the Group in conformity with Accounting Standards for Business Enterprises ("PRC GAAP"), differ in certain respects from those of IFRSs. The major impact of adjustments for IFRSs, on the net consolidated profit and equity attributable to equity holders of the Company, is summarised as follows:

	Consolidated profit attributable to equity holders of the Company For the year ended		Total equity attributable to equity holders of the Company As at 31 December	
	2021	2020	**2021**	2020
Consolidated net profit/equity attributable to equity holders of the Company under PRC GAAP	**(10,264,366)**	4,564,990	**105,255,590**	121,698,538
Impact of IFRS adjustments:				
Differences in accounting treatment on business combinations under common control, depreciation, amortisation, disposal and impairment of assets acquired in business combinations under common control (a)	**(777,213)**	(3,949,423)	**7,079,379**	7,856,592
Difference on depreciation related to borrowing costs capitalised in previous years (b)	**(25,597)**	(27,016)	**75,825**	101,422
Others	**(40,695)**	(63,777)	**(394,630)**	(396,563)
Applicable deferred income tax impact on the GAAP differences above (c)	**326,042**	947,059	**2,905,435**	2,579,393
Profit/equity attributable to non-controlling interests on the adjustments above	**145,635**	906,018	**(1,873,785)**	(1,993,459)
Consolidated net profit/equity attributable to equity holders of the Company under IFRSs	**(10,636,194)**	2,377,851	**113,047,814**	129,845,923

(a) Differences in the accounting treatment on business combinations under common control and depreciation, amortisation, disposal and impairment under common control

Huaneng Group is the parent company of HIPDC, which in turn is also the ultimate parent of the Company. The Company has carried out a series of acquisitions from Huaneng Group and HIPDC in recent years. As the acquired power companies and plants and the Company were under common control of Huaneng Group before and after the acquisitions, such acquisitions were regarded as business combinations under common control.

In accordance with PRC GAAP, for business combinations under common control, the assets and liabilities acquired in business combinations are measured at the carrying amounts of the acquirees in the consolidated financial statements of the ultimate controlling party on the acquisition date. The difference between the carrying amounts of the net assets acquired and the consideration paid is adjusted to the equity account of the acquirer. The operating results for all periods presented are retrospectively restated as if the current structure and operations resulting from the acquisition had been in existence since the beginning of the earliest year presented, with financial data of previously separate entities consolidated. The cash consideration paid by the Company is treated as an equity transaction in the year of acquisition. The subsequent adjustment of contingent consideration after the acquisition date is also accounted for as an equity transaction.

For business combinations occurred prior to 1 January 2007, in accordance with Previous PRC GAAP, when equity interests acquired were less than 100%, the assets and liabilities of the acquirees were measured at their carrying amounts. The excess of the consideration over the proportionate share of the carrying amounts of the net assets acquired was recorded as an equity investment difference and amortised on a straight–line basis for not more than 10 years. When acquiring the entire equity, the entire assets and liabilities are accounted for in a manner similar to purchase accounting. Goodwill arising from such transactions was amortised over the estimated useful lives on a straight-line basis. On 1 January 2007, in accordance with PRC GAAP, the unamortised equity investment differences and goodwill arising from business combinations under common control were written off against undistributed profits.

Under IFRSs, the Company and its subsidiaries have adopted the purchase method to account for the acquisitions above. The assets and liabilities acquired in acquisitions were recorded at fair value by the acquirer. The excess of the acquisition cost over the proportionate share of fair value of net identifiable assets acquired was recorded as goodwill. Goodwill is not amortised but is tested annually for impairment and carried at cost less accumulated impairment losses. The operating results of the acquirees are consolidated in the operating results of the Company and its subsidiaries from the acquisition dates onwards. The contingent consideration not classified as equity is measured at fair value at each reporting date with the changes in fair value recognised in profit or loss, if such changes are not measurement period adjustments.

As mentioned above, the differences in the accounting treatment under PRC GAAP and IFRSs on business combinations under common control affect both equity and profit. Meanwhile, due to different measurement bases of the assets acquired, depreciation and amortisation in the period subsequent to the acquisition will be affected which will also affect the equity and profit or loss upon subsequent disposals of such investments. Such differences will be gradually eliminated following subsequent depreciation, amortisation and disposal of the related assets.

RECONCILIATION OF FINANCIAL STATEMENTS BETWEEN PRC GAAP AND IFRS

FOR THE YEAR ENDED 31 DECEMBER 2021
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

(b) Effect of depreciation on the capitalisation of borrowing costs in previous years

In previous years, under Previous PRC GAAP, the scope of capitalisation of borrowing costs was limited to specific borrowings, and thus, borrowing costs arising from general borrowings were not capitalised. In accordance with IFRSs, the Company and its subsidiaries capitalised borrowing costs on general borrowings used for the purpose of obtaining qualifying assets in addition to the capitalisation of borrowing costs on specific borrowings. From 1 January 2007 onwards, the Company and its subsidiaries adopted PRC GAAP No. 17 prospectively. The current adjustments represent the related depreciation on capitalised borrowing costs included in the cost of the related assets under IFRSs in previous years.

(c) Impact of GAAP differences on deferred income tax

This represents the impact of GAAP differences above on the related deferred income tax where applicable.



華能國際電力股份有限公司

Huaneng Power International, Inc.

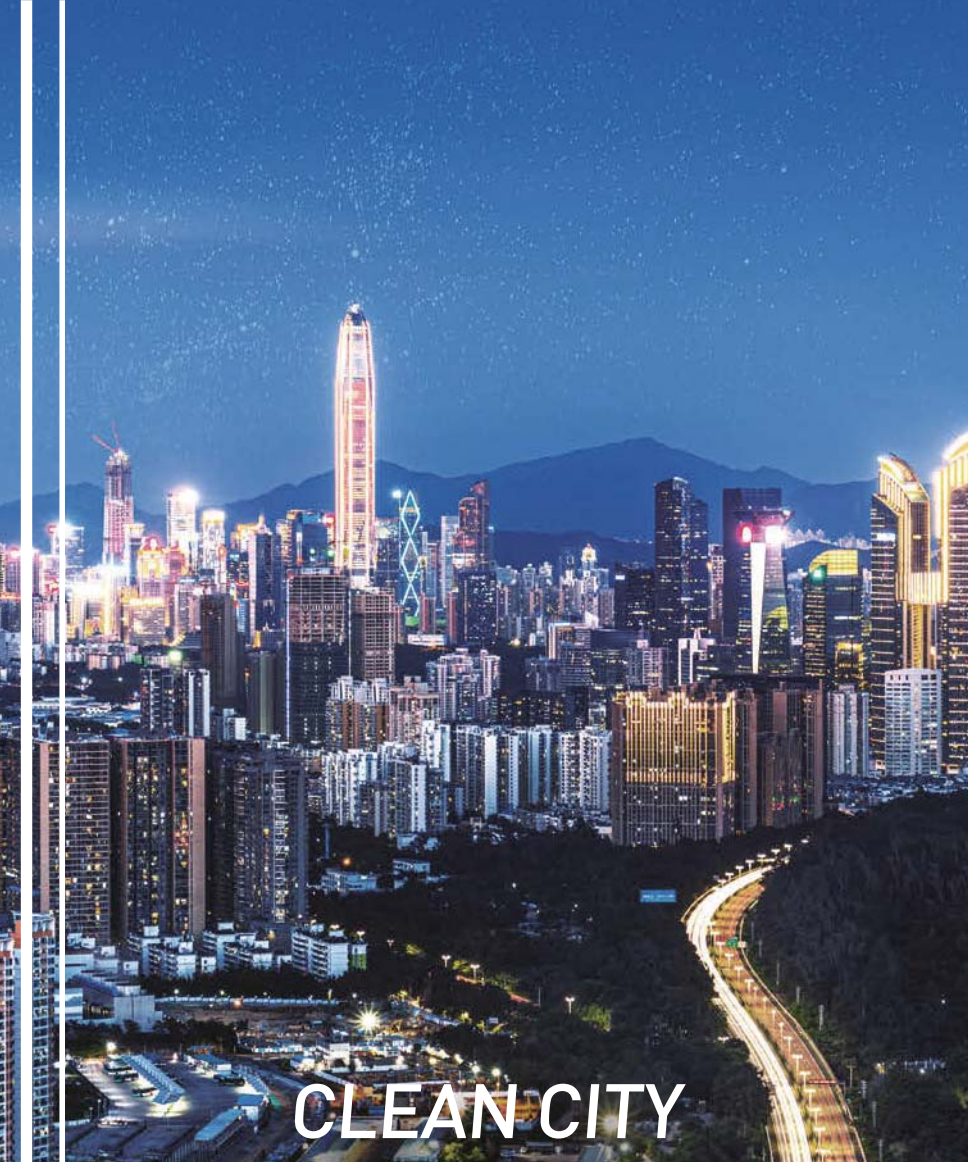
華能國際電力股份有限公司
Huaneng Power International, Inc.

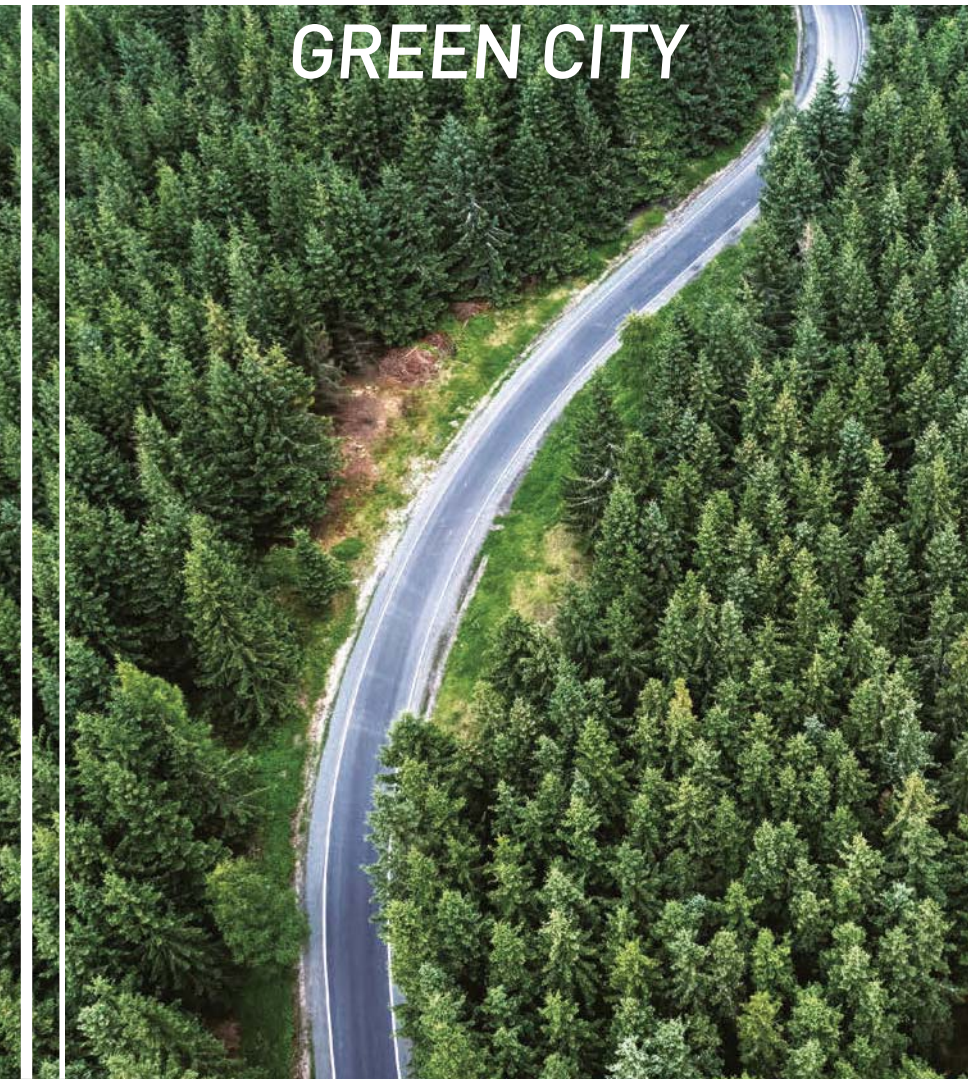


GREEN ENERGY
GREEN FUTURE
綠色動力 綠色未來

2021

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


CLEAN CITY


GREEN CITY

Contents

01 Chairman's Statement

2

02 About us

2.1 Company Profile 6
2.2 Corporate Governance 7
2.3 Development Strategy 7
2.4 Company Philosophy 8
2.5 ESG Responsibility Management 8
2.6 Table of Key Performance Indicators in 2021 11
2.7 Communication with Stakeholder and Identification of Material Issues 15
2.7.1 Information about and Communication with Stakeholder 15
2.7.2 Process of Identification of Material Issues 16

03 Push Forward the Reform of Electric Power System

20

04 Performing Duties by Assiduous Action

4.1 Improving Capability of Guaranteeing Energy Supply 26
4.2 Sparing no Effort in Compliance Management 29
4.2.1 Management by Law 29
4.2.2 Anti-corruption 30
4.2.3 Protection of Intellectual Property Rights 33

05 Transformation Development Driven by Innovation

5.1 Accelerating the Green Development 36
5.2 Breakthroughs in Independent Innovation 38
5.3 Promoting Energy Saving and Consumption Reduction Solidly 40
5.3.1 Overall Planning 40
5.3.2 Energy Consumption Management 40
5.3.3 Water Resources Management 43
5.3.4 Emissions management 44
5.3.5 Other Environmental Impacts 53

06 Solidifying the Bottom Line for Safe Production

6.1 Consolidating the Closed-loop of Intrinsic Safety 56
6.2 Consolidating the Foundation of Safety Development 59
6.3 Adopting Vigorous Safety Measures 60
6.4 Caring and Safeguarding Occupational Health 63
6.5 Improving Employees' Safety Awareness 64
6.6 Tightening the Focus on Infrastructure Safety Management 65

07 Enhancing the Talented Team Building

7.1 Protecting Employees' Rights and Interests 68
7.2 Promoting Employee Development 69
7.3 Caring Occupational Health 71

08 Making Concerted Efforts to Seek Common Development

8.1 Deepening Supply Cooperation 74
8.2 Providing Quality Service 76
8.3 Fulfilling Social Responsibilities 76

09 Building An International Business Platform

80

10 Sound Development with Vigorous and Determined Endeavour

88

11 Appendix

11.1 About this Report 91
11.2 Statement of the Board of Directors 92
11.3 Contents Index of the Environmental, Social and Governance (ESG) Reporting Guide by the Hong Kong Stock Exchange 93
11.4 Contents Index of GRI Sustainability Reporting Standards (GRI Standards) of Global Reporting Initiative 98
11.5 Readers' Feedback 106

CHAIRMAN'S STATEMENT



2021 witnessed an special and extraordinary journey of the development of Huaneng International. Confronted with the major changes and the pandemic both unprecedented in a century, accompanied by the extensive power shortage, all members of the Company at different levels worked together to cope with the difficulties in a pragmatic and assiduous manner, harvesting a pleasant start for the "14th Five-Year Plan". Our achievements in this process include significant strength gaining in independent innovation, great progress in reform, new records of capacity and output, doubled market value, and notable progress in the development of new energy and the structural optimisation of coal-fired power, testifying to our new commitments and new actions in the establishment of a new development model.

Adhering to the philosophy of green and low-carbon development, the Company endeavours to enhance its capabilities of transformation and development. With the goals of peaking carbon dioxide emissions and achieving carbon neutrality, the Company has been making every effort to increase the proportion of clean energy, promote the leapfrog development of new energy, drive the development of gas-fired power by giving it the highest priority, expand the environment-friendly modification and upgrading of coal-fired power generation units, and build a development model of power generation, power grid, load and power storage integration and multi-energy complementation.

Insisting on self-reliance and self-improvement, the Company endeavours to increase capability of independent innovation, optimise the systems and mechanisms for technological innovation and inspire the creativity and vitality of those engaged in innovation. The Company continues to increase investment in research and development to accelerate the application of technological achievements, ensure the implementation and breaking development of critical projects that are technologically such as "Key & Core Technology", significantly increase the number of technological patents, and make initial progress in digital transformation.

The Company adheres to excellent operation. We strive to improve operation and management capabilities and promote quality-orientated reforms, efficient business operation and asset structure upgrading in an all-round manner, so as to continuously strengthen value creation capability, steadily improve the quality as a listed company and enhance development momentum.



The Company adheres to the concept of general safety. We strive to improve risk prevention capability, prudently implement pandemic prevention and control, thoroughly fulfil the responsibility for energy supply, and further improve intrinsic safety management, thus guaranteeing personal and equipment safety and achieving success both in the battle against pandemic and the development of production and operation.

The Company adheres to the principles of openness and cooperation. We endeavour to improve international management, actively seek opportunities of overseas business expansion, and participate in the development of the "Belt and Road" initiative at a higher level to promote cooperation to a higher level, improve investment efficiency, supply quality and development resilience, and ultimately promote the Company's international development and management to a higher level.

Moving forward with responsibilities shouldered, the Company will fully implement the new philosophy of development, insistently adhere to sustainable development, actively promote reform and innovation, continue to improve management and effectively fulfil social responsibilities. Upholding the spirits of persistence and hardworking, we will accelerate the development into a global-leading listed company engaged in power generation and write a grand chapter of high-quality development in the new era.

Zhao Keyu

Chairman
of Huaneng Power International, Inc.

02



ABOUT US



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 while actively exploring power generation markets overseas. 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, the Company has been insisting on innovations in technologies, structure, and management since its incorporation. 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 positive transformation to low carbon, clean energy, advantages in scientific and technological innovation and environmental protection, 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 well as strong support from major shareholders.

As at 31 December 2021, the Company has controlled installed capacity of 118,695 MW, equity-based installed capacity of 103,875 MW and the proportion of low carbon, clean energy installation reaching 22.39%. 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.

As at 31 December 2021, Controlling Generation Capacity



118,695MW



Equity-Based Generation Capacity

103,875MW



Low-carbon and Clean Energy Installed Capacity

22.39%

In 2021, the Company was awarded "Excellent Issuer of Corporate Bonds", "A" grade rating for annual information disclosure granted by the Shanghai Stock Exchange, the Golden Bauhinia Award for the "Best Listed Company" by the China Securities, and "Top 50 Outstanding Listed Company for the Year" by Interface News, etc. In addition, the Company's ESG practice experience was extracted to White Paper on the ESG Development of Listed Companies in China (2021) (《中國上市公司ESG發展白皮書(2021)》)by China Association for Public Companies and recorded as the first case in the ESG Practice Case for Listed Companies (《上市公司ESG實踐案例》)by China Association for Public Companies, and was invited to introduce the Company's ESG practical experience to the Main Board of the Shanghai Stock Exchange and listed companies in the Science and Technology Innovation Board at the ESG special training held by the Shanghai Stock Exchange. These awards represented the endorsement by the capital market of the Company's achievements in continuously deepening reform, vigorously promoting technological innovation and pursuing of green development since the period of "14th Five-Year Plan". The external auditor has issued a standard unqualified audit report on the Company's internal control for sixteen consecutive years.

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 security regulatory authorities of the three listing venues and the supervision of investors at large. Since its establishment, the Company has been strictly complying with the laws and regulations of its listing place and continuously completing and improving its modern governance system and capacity. The Company have established and improved a corporate governance structure consisting of the shareholders' general meeting, the Board, the Supervisory Committee, and senior management and built an operating system where those granted with proprietorship, 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, as well as the efficiency and compliance of the operation and management of senior management.

After years of exploration and practice, the Company has built up a normal, effective and sound corporate governance system that caters for the development of the Company. The Company regularly evaluated the applicability and effectiveness of the management system and revised and improved it in a timely manner to achieve dynamic maintenance of the system. In 2021, in light of the latest regulatory requirements and the Company's actual situation, the Company amended the Management Measures for Information Disclosure (《信息披露管理辦法》), Insider Management Rules (《內幕信息知情人管理辦法》), Code for the Management of the Company's Shares Held by Directors, Supervisors and Senior Management (《董事、監事及高級管理人員所持本公司股份管理守則》), etc.

2.3 Development Strategy

The Company fully implements the new development philosophy of "innovation, coordination, green, openness and sharing," adheres to the idea of systemisation, follows the requirements of establishing a clean, low-carbon, safe and efficient modern energy regime, adheres to the principle of treating quality and efficiency as the key focus, reform and innovation as the driving force, institutional mechanism as the safeguard, and deepening the supply-side structural reforms as the cardinal line, coordinates the energy safety and "green development," comprehensively promotes the high-quality developments, and aims to further develop the Company into a proper managed, leading in technology, energy saving and environmental friendly, reasonable structured, excellently operated world-class listed power generation company with outstanding corporate governance and market value.



Power Plant in Haimen

The Company adheres to the new energy safety strategy of "Four Revolutions and One Cooperation," promotes the green and low-carbon transformation of energy with the aims of peak carbon emission and carbon neutrality, prioritizes the quality and efficiency, insists on principles of "centralized and distributed construction of equal importance, and independent construction of priority". Making full use of the favorable conditions for centralized development of new energy power in "Three-North Area," coastal region, Southwest China region and certain areas in Central China region, the Company further develops large-scale clean energy production base, with the idea of "Three-types and Three-isations" namely "base-type, clean-type and complementary-type, together with intensification, digitalization and standardization", promotes the leap-forward development of new energy production, accelerates the optimization and upgrading of coal-power structure, prioritizes the gas power and other clean energy power, and provides more competitive and finer comprehensive energy services. The Company proactively adapts to the national structural reform of energy supply, persists on accelerating digitalized transformation, actively develops strategic emerging industries, and carries out transformation of diversified supply and energy service around core industries. Adhering to the new development pattern of integrating domestic and international dual circulations, the Company will strength international cooperation with the principles of clean being primary, profitability being first and prudence being essential, to reinforce the efficient operation of oversea assets and to enhance the anti-risk ability and profitability. The Company aims to actively implement innovative development strategy, focuses on high-quality development led by technological innovation mechanisms, continues to serve the nationwide strategy, and adhere to the facing towards the Company's major demands. The Company adheres to digital & intelligent development, deepens and enhances the ability of independent innovation, implements scientific and technological demonstration projects, and strengthens basic and forward-looking technical research. The Company aims to vigorously implement the excellent operation strategy, adhere to the strategies of increasing profitability, improving efficiency and creating value, reinforce its operational management, improve its management efficiency, optimize its asset structure, comprehensively improve its modern operating and management level, vigorously promote the improvement of quality and efficiency, improve corporate governance, enhance the Company's brand value and conscientiously perform its social responsibilities.

2.4 Company Philosophy

Corporate Missions	• Becoming a "red" company that 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

Focusing on the general trend of national economic development and based on the principle of "priority on stabilization, and advancement from stabilization," the Central Economic Work Conference proposed several key goals as the fundamental principles and action guidance to follow for the national economy development in year 2022 and longer terms thereafter, such as to implement stable and effective macroeconomic policies, continue to stimulate the vitality of market entities, smoothen the national economic cycle, solidly implement science and technology policies, and stimulate developments by implementing reform and opening up policies, and enhance the balance and coordination of the regional developments and securing the basic goals for residents' livelihood. The Conference also proposed that correct understanding of the essence of the carbon peak and carbon neutralization should be established, and the gradual withdrawal of traditional energy should be based on the safe and reliable substitution of new energy. Based on the basic national conditions of coal, we should pay attention to the clean and efficient utilization of coal, increase the consumption capacity of new energy, and promote the optimal combination of coal and new energy. At the same time, the Conference proposed that renewable energy and raw material energy consumption should not be calculated into the total energy consumption control.

In terms of the electricity supply and demand, according to the analysis and forecast of the China Electricity Council, with the considerations such as the domestic and international economic situation, the steady increment of electrification driven by electric power replacement, statistic comparison base of last year, as well as the uncertainty resulting from the epidemic and other the external events, it is estimated that the electricity consumption of the whole society will have a year-on-year increase of 5%-6% in year 2022, a growth rate that is four percentage points lower as compared to that in year 2021. It is estimated that in year 2022, the newly installed power generation capacity nationwide will be about 230 million kilowatts a record high over the years, while the utilization hours for thermal units will decrease slightly on a year-on-year basis.

In terms of electricity market, on January 18, 2022, the NDRC and the National Energy Administration jointly issued "Guidance on accelerating the construction of a national unified power market system", aiming to realize the sharing, mutual assistance and optimal allocation of power resources across the country, and accelerate the formation of a unified, open, orderly, safe and efficient power market system with efficient governance. As all coal fired electricity shall totally enter into trade within the electricity grid market as stipulated by principle, the transaction ratio of the total amount of electricity generated demonstrate an upward growth. And considering the combined effects of the fluctuations of coal market prices, the inter-provincial negotiation over electrovalence for outbound transactions, the spot electrovalence fluctuating with coal prices, and the electrovalence of pumped-hydroelectricity being set by the government, the rising range of the price of coal-fired electricity is expected to be less than 20%. Affected by the increase in the number of new energy parity projects putting into operation, the prices of wind and photovoltaics have decreased compared with year 2021, while the price of hydropower electricity remains the same as that of year 2021. In respect of carbon market, China Carbon Emission Trade Exchange (CCETE) was officially launched in year 2021, with the first fulfilment cycle during year 2019 to year 2020 closed smoothly. Carbon emission quota is expected to be tightened under the background of relevant national policy switching from "dual energy consumption control" to" dual control of carbon emission amount and emission intensity".

In terms of the coal market, the CPC Central Committee currently attaches great importance to the safe supply of coal production and the relevant governmental authorities issued multiple industry policies to stabilize the supply and demand of coal market. On February 24, 2022, the NDRC issued the "Notice on Further Improving the Coal Market Price Formation Mechanism," specifying that mid- and long-term coal supply contracts should adopt the reasonable price range between RMB570 to RMB770 per ton (tax inclusive) and making it clear that pricing adjustment measures regarding coal price will be made pursuant to the Pricing Law. Such measures are expected to facilitate the normalization of thermal coal price. On the coal consumption side, given the establishment of the policy on controlling the increase of coal consumption during the "Fourteenth Five-Year" period and the scale development of the renewable energy section, it is expected that the increase of the coal demand shall slowdown in year 2022. While on the supply side, the advanced production capability has been gradually released domestically, which, together with the fact that coal exportation by Indonesia restored at a normal level, shall improve the supply situation of the thermal coal market. With the supply-demand situation significantly improved as compared to 2021, it is expected that the coal price will fall into a more reasonable range.

In terms of the capital market, the monetary policy in 2022 is expected to be prudent with proper flexibilities, which will increase the intensity of cross-cycle adjustment, give full play to the dual functions of the total amount and structure of monetary policy tools, and focus on sufficient effectuation, precise effectuation, and forward effectuation, aiming to meet the reasonable and effective financing needs of the real economy without having "flooding irrigation" effects, and focus on increasing financial support for key areas and weak links of the economy, so as to achieve a better goal combining the stabilized total volume with an optimized structure and maintain a reasonably abundant liquidity.

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, namely 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, approval of the Company's comprehensive risk management annual report, risk rating, risk management, effectiveness evaluation, and approval of risk assessment reports on important decisions. The audit committee, composed entirely of independent directors of the Company, is responsible for identifying

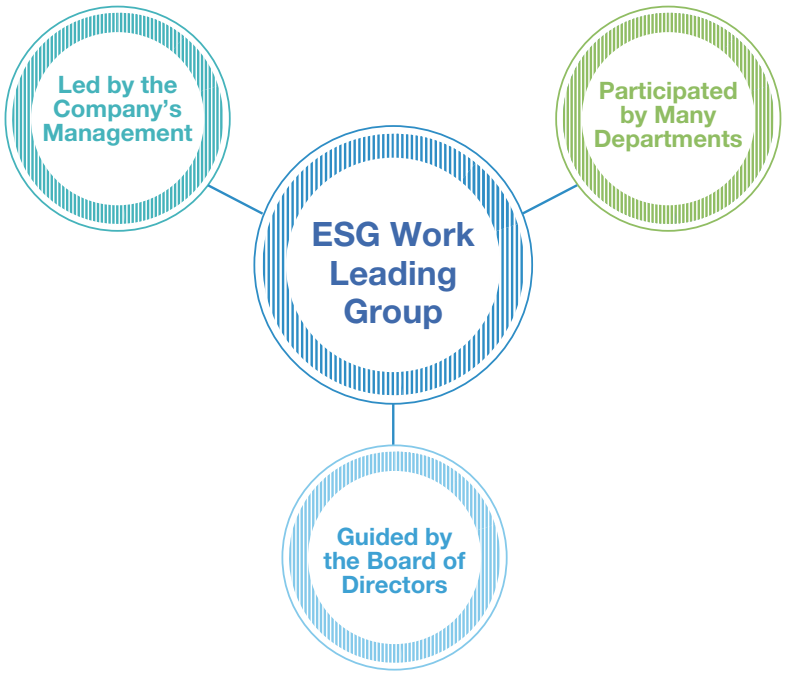


and assessing the risk of fraud committed by board members of the Company and senior executives and compiles independent fraud risk assessment reports. It also regularly reviews reports on the Company's internal controls and evaluates the effectiveness of the internal control system and communicates with the human resources department on issues concerning recruitment and code of conduct. Independent directors 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 control and corporate culture has already been incorporated into the daily work of the board and various special committees, which also closely monitor current hot issues such as climate change response and ESG information disclosure, and propel the Company toward balanced development in economic benefits, social benefits and ecological benefits.

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.

Trainings for Directors, Supervisors, and Senior Management

The Company's directors, supervisors and senior management attach great importance to improving the awareness of compliance and the ability to fulfil duties, and actively participate in various special trainings held by regulatory authorities and industry associations to keep up on the updates of the local regulations and policies of the places where they are listed. In 2021, our people attended various trainings for a total of 40 person-times, including the follow-up training for independent directors organised by the Shanghai Stock Exchange (5 person-times), and the special training for directors and supervisors organised by regulatory authorities (29 person-times). The chairman and general manager actively participated in a variety of important meetings including the special training meeting for the listed companies controlled by State-owned Assets Supervision and Administration Commission ("SASAC") or enterprises directly under the central government, the annual and semi-annual meetings on supervision work held by CSRC Beijing Bureau, supervision meeting on bond and asset securitisation business, etc. The secretary of the Board of Directors participated in 6 sessions of enhanced continuing professional development training organised by the Hong Kong Chartered Governance Institute, receiving in-depth lessons of new regulatory developments, the latest requirements of standards, the Company's compliance operations, cases of violations of laws and regulations, and anti-corruption and anti-fraud cases. All the directors, supervisors and senior management consciously abide by the laws, regulations and the Company's Articles of Association, and strictly follow the principle of self-discipline and bottom line, guaranteeing the continuous improvement of corporate governance. The Company also provides directors with trainings related to the ESG reporting guide by distributing written materials.



2.6 Table of Key Performance Indicators in 2021

Based on the requirements of HKEX's ESG Reporting Guide and the Global Reporting Initiative (GRI)'s Sustainability Reporting Standards (《可持續發展報告標準》), Huaneng International has prepared and analysed the Company's ESG 2021 key performance indicators, benchmarking against the guidelines' requirements and its peer companies, as set out below.

Performance Categories	Performance Indicators	2021	2020
Economy	Operating revenue[1] (100 million RMB)	2,046.05	1,694.46
	Sales of power and heat[1] (100 million RMB)	1,936.51	1,614.53
	Sales of coal and raw materials[1] (100 million RMB)	30.41	18.87
	Port service[1] (100 million RMB)	2.42	1.98
	Transportation service[1] (100 million RMB)	0.60	0.52
	Others[1] (100 million RMB)	76.11	58.56
	Operating expenses[1] (100 million RMB)	2,102.86	1,557.34
	Net profit[1] (100 million RMB)	-131.91	26.11
	Controlling generation capacity[1] (MW)	118,695	113,357
	Equity-based generation capacity[1] (MW)	103,875	98,948
	Domestic power generation (100 million kWh)	4,573.36	4,040.16
	Average annual unplanned outage (times/unit·annum)	0.22	0.19
Environment	Coal consumption rate for thermal power unit (g/kWh)	290.69	291.08
	Year-on-year change of coal consumption rate for thermal power unit (%)	0.13 ↓	1.00 ↓
	Consumption of standard coal (ten thousand tons of standard coal)[2]	13,200.22	11,817.11
	Oil consumption in production (tons)	37,709.02	29,761.39
	Natural gas consumption (ten thousand of standard cubic meters)	581,655.30	537,014.18
	House consumption rate of thermal power unit (%)	4.34	4.33
	Overall water consumption (million tons)	23,126.31	18,193.78
	Fresh water consumption in power generation (million tons)	361.16	382.74
	Water consumption in open cooling circulation (million tons)	22,765.15	17,811.04

Performance Categories	Performance Indicators	2021	2020
Environment	Performance value of consumption of fresh water in power generation (kg/kWh)	0.79	0.95
	Performance value of emission of sulphur dioxide (g/kWh)[3]	0.07	0.07
	Performance value of emission of nitrogen oxides (g/kWh)[3]	0.14	0.13
	Performance value of soot emission (g/kWh)[3]	0.01	0.01
	Sulphur dioxide emissions (tons)[3]	28,712.24	25,990.39
	Nitrogen oxides emissions (tons)[3]	58,347.32	50,875.08
	Soot emissions (tons)[3]	3,636.08	3,264.55
	Total amount of energy-related direct greenhouse gas emissions (ten thousand tons of carbon dioxide equivalent)[4]	–	33,328.88
	Greenhouse gas emissions generated by coal consumption (ten thousand tons of carbon dioxide equivalent)[4]	–	32,107.79
	Greenhouse gas emissions generated by natural gas consumption (ten thousand tons of carbon dioxide equivalent)[4]	–	1,024.91
	Greenhouse gas emissions generated by fuel consumption (ten thousand tons of carbon dioxide equivalent)[4]	–	9.53
	Greenhouse gas emissions generated by desulphurisation (ten thousand tons of carbon dioxide equivalent)[4]	–	186.65
	Energy-related direct greenhouse gas emission intensity (grams of carbon dioxide equivalent/kWh)[4]	–	726.09
	Total amount of energy-related indirect greenhouse gas emissions (ten thousand tons of carbon dioxide equivalent)[4]	–	11.37
	Energy-related indirect greenhouse gas emission intensity (grams of carbon dioxide equivalent/kWh)[4]	–	0.25
	Total water discharge (million tons)	20,781.65	17,282.60
	Total discharge of sewage (million tons)	26.54	31.98
	Total discharge of open cooling circulation water (million tons)	20,755.11	17,250.62
	Hazardous liquid water production (tons)	1,277.32	784.59
	Production of denitration catalysts (tons)	7,602.35	7,899.14
	Production of other hazardous solid waste (tons)	577.15	201.09
	Intensity of hazardous waste (g/kWh)	0.02	0.02
	Production of general solid waste (ten thousand tons)	4,707.38	4,133.50
	Production of fly ash and cinder (ten thousand tons)	3,738.26	3,274.18
	Production of desulphurised gypsum (ten thousand tons)	969.12	859.32

Performance Categories	Performance Indicators	2021	2020
Environment	Intensity of general solid waste (kg/kWh)	0.10	0.10
	Comprehensive utilisation rate of fly ash and cinder (%)	92.20	89.08
	Desulphurisation gypsum disposal utilisation rate (%)	87.07	87.55
	Amount of grievous (and above) environmental accidents (times)	0	0
Society	Total amount of full-time contractual employees[1] (persons)	57,513	57,874
	Total number of male employees (persons)	44,959	–
	Total number of female employees (persons)	12,554	–
	Total number of employees aged 30 and below (persons)	11,386	–
	Total number of employees aged between 31 and 50 (persons)	31,540	–
	Total number of employees aged above 50 (persons)	14,587	–
	Total number of employees in China (persons)	56,915	–
	Total number of employees in overseas regions (including Hong Kong, Macao and Taiwan) (persons)	598	–
	Total number of full-time employees (persons)	57,513	–
	Total number of part-time employees (persons)	0	–
	Employee turnover rate (%)	0.36	–
	Turnover rate of male employees (%)	0.36	–
	Turnover rate of female employees (%)	0.37	–
	Turnover rate of employees aged 30 and below (%)	0.97	–
	Turnover rate of employees aged between 31 and 50 (%)	0.28	–
	Turnover rate of employees aged above 50 (%)	0.07	–
	Turnover rate of employees in China (%)	0.29	–
	Turnover rate of employees in overseas regions (including Hong Kong, Macao and Taiwan) (%)	7.02	–
	Number of employees received trainings (persons)	54,720	–
	Proportion of employees received trainings (%)	95.14	–
	Proportion of male employees received trainings (%)	96.15	–

Performance Categories	Performance Indicators	2021	2020
Society	Proportion of female employees received trainings (%)	91.53	–
	Proportion of management personnel received trainings (%)	95.16	–
	Proportion of non-management personnel received trainings (%)	95.14	–
	Training hours per employee (hours)	133	–
	Training hours per male employee (hours)	134	–
	Training hours per female employee (hours)	130	–
	Training hours per management personnel (hours)	93	–
	Training hours per non-management personnel (hours)	137	–
	Number of employee deaths due to duty[5] (persons)	1	0
	Number of contractor and subcontractor deaths due to duty[6] (persons)	0	1
	Grievous personal injury and death accidents employees (times)	0	0
	Personal injury and death accidents during the power production (times)	1	0
	Accidents that endangered safe operation of power grid (times)	0	0
	Days lost due to work injury (days)	0	–
	Rate of work-related deaths (%)	0.0017	–
	Total suppliers (number)	54,294	–
	Domestic suppliers from Mainland China (number)	53,910	–
	Overseas suppliers including Hong Kong, Macao and Taiwan (number)	384	–
	Customer complaints (number)	0	–
	Concluded lawsuits on corruption against the Company and its employees (number)	0	0
	Average equivalent availability of thermal power units (%)	93.26	94.92

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 consumption of standard coal is the sum of various types of energy consumption, calculated according to the General Principles for the Calculation of Comprehensive Energy Consumption (《綜合能耗計算通則》) (GB/T2589-2020).

3 The Company's exhaust gas emissions are counted and calculated according to the actual concentration of pollutants.

4 On July 16, 2021, the national carbon market officially opened the first performance cycle of carbon emissions trading, according to the Ministry of Ecology and Environment of the PRC of the carbon emissions trading management approach (trial) (《碳排放權交易管理辦法(試行)》), the performance unit in carbon emissions quota amount quantity should be greater than or equal to last year's actual carbon emissions, carbon emissions quotas by the national carbon trading market. Therefore, the actual greenhouse gas emissions in 2021 are trade secrets and will not be disclosed for the time being. Disclosure will be made at the end of 2022 after the performance of the contract is formally completed.

5 Number of employee deaths due to duty: the number of employees who died from production safety incidents in 2019 and 2020, we had no work-related deaths.

6 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.

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 organisation 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 advocacy and promotion of energy conservation and emission reduction
Competitors	Fair competition; honest cooperation; joint development; safe production	Participation in industry associations[7], 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

[7] Such as China Electricity Council, Chinese Society for Electrical Engineering, Global Energy Interconnection Development and Cooperation Organization, etc.

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:

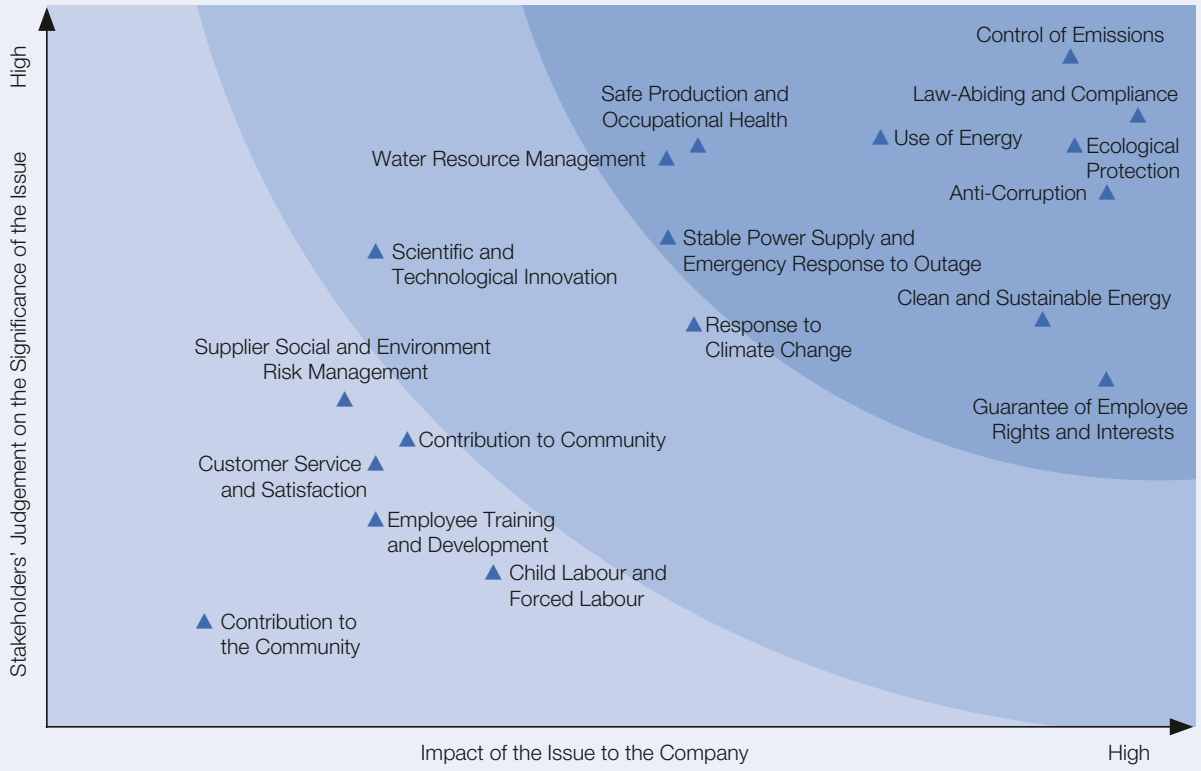
1 **Identifying relevant issues: sources of issues include Environmental, Social and Governance Reporting Guide of HKEX, GRI Sustainability Reporting Standards (《可持续发展报告标准》) and matters disclosed by domestic and international peers.**

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

DISTRIBUTION OF POWER PLANTS OF THE COMPANY

The controlled installed capacity of the Company as at 31 December 2021 was 118,695 MW, distributed in areas as depicted in the chart (Unit: MW)

CHINA NETWORK

Heilongjiang 3,896	Jilin 3,150	Liaoning 5,138	Inner Mongolia 273	Hebei 3,027	Gansu 3,897
Ningxia 20	Beijing 2,766	Tianjin 1,675	Shanxi 3,732	Shandong 21,670	Henan 8,080
Jiangsu 11,448	Shanghai 5,012	Chongqing 3,735	Zhejiang 6,251	Hubei 3,973	Hunan 2,954


Jiangxi
6,748
Anhui
1,614
Fujian
4,053
Guangdong
6,306
Guangxi
321
Yunnan
3,800
Guizhou
745
Hainan
2,403
OVERSEAS NETWORK
Singapore
2,009
Total
118,695
LEGENDS
Wind-power
PV Power
Coal-fired
Combined Cycle
Hydro-power
Biomass power

PUSHING FORWARD THE REFORM OF ELECTRIC POWER SYSTEM





03

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. The construction of the national power market is progressing steadily and orderly, with the proportion of electricity traded on market increased significantly. The reform of electricity market has been gradually advanced in an all-round manner.

Pushing Forward the Reform of Electric Power System

On October 15, 2021, NDRC issued the Notice on Further Deepening the Market-Based Reform of the On-grid Price for Coal-fired Power Generation (《關於進一步深化燃煤發電上網電價市場化改革的通知》). The notice clarifies that all coal-fired power generation will enter the power market in principle, and the range of trading electricity prices in the coal-fired power generation market will be expanded to no more than 20% in principle. Electricity prices, to promote all industrial and commercial users to enter the electricity market. The Company deepened the reform of the power system, accelerated the market-oriented reform of electricity pricing, promoted the mechanism of market-based electricity pricing, assisted in the construction of a new electric power system, and guaranteed the safe and stable supply of electricity.

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, Huaneng International has coordinated the business of both 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 2021, facing the new situations and challenges brought by the continuous progress of electricity reform and the tough task of guaranteeing energy supply, the Company made active response, spared no effort to promote the work of increasing coal-fired electricity price and safeguarded stable power supply by playing its role in the market supply. The major measures adopted are as follows:



1 **The introduction of policies related to favourable electricity pricing.** The Company has carefully studied the power reform policies and actively guided the introduction of favourable policies to promote the implementation of various supporting policies, relieve the pressure on the operation of coal power and guarantee the stable supply of power and heat.





2 **The flexible adjustment of power generation strategy.** We insistently keep an eye on and study the national macro-economy, the supply and demand of power, and the situation of the coal market, coordinate all subsidiaries and power plants to adjust power generation and trading strategies, explore the potential of internal coordination and peak regulation, and make a full use of various favourable policies to maximise the Company's overall efficiency.

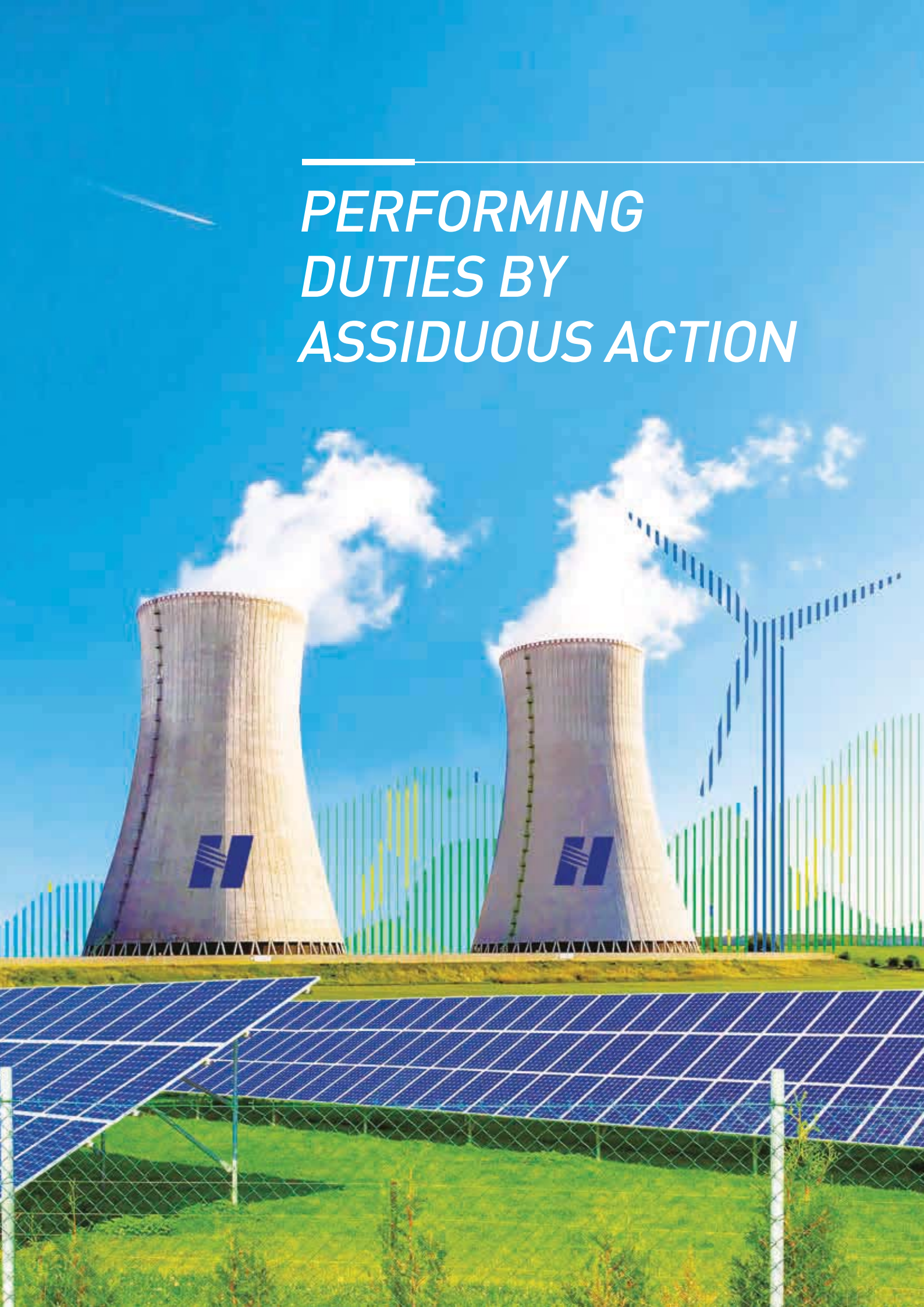
3 **Enhancing learning and training.** The Company promoted the establishment of operation centres in the second batch of pilot subsidiaries in Hubei and Liaoning, and guided the pilot subsidiaries to accelerate the selection, training, and reserve of trading personnel. The Company organised three sessions of sales skill training courses, one session of advanced training course for spot quotation staff, and two sessions of training courses on spot trading for director-level marketing staff, comprehensively enhancing the competitiveness of the marketing team.

04

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 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.



PERFORMING DUTIES BY ASSIDUOUS ACTION



Performing Duties by Assiduous Action

4.1 Improving Capability of Guaranteeing Energy 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.

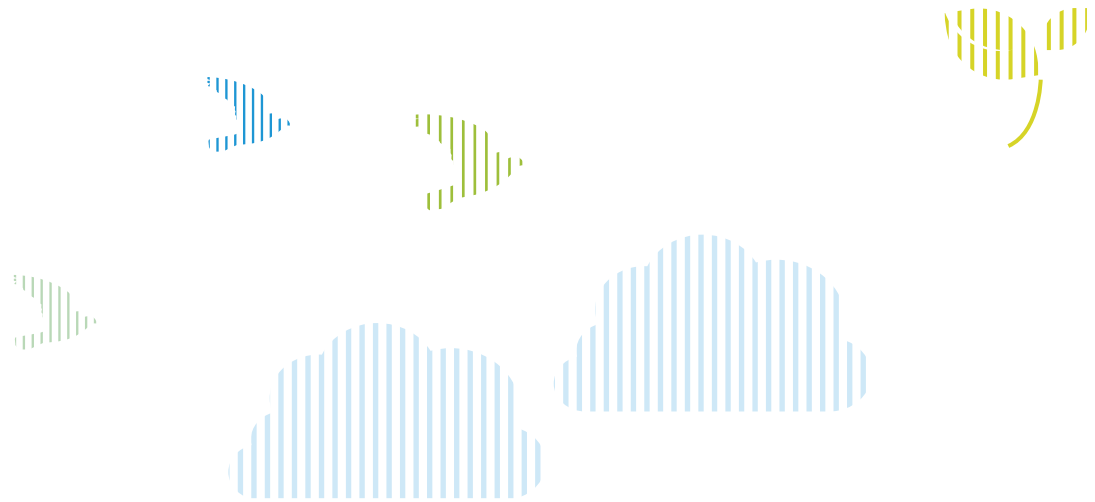
Establishing a Policy Guarantee Mechanism

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 (《黑啓動應急預案》), 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.

Strengthening Daily Equipment 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[11] 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 2021, the Company has been achieving an average 0.22 times of unplanned outages per unit per year.



[8] Six Stabilisations: the stabilisation of the six fronts (employment, finance, foreign trade, inbound investment, domestic investment, and market expectations); Six Guarantees: the guarantee of the six priorities (jobs, daily living needs, food and energy, the interests of market players, industrial and supply chains, and the smooth functioning of grassroots government).

[9] A/B: Level-A maintenance refers to an overall dismantling, inspection and repair of the generator unit to maintain, restore or improve the performance of equipment; Level-B maintenance refers to a portion of level-A maintenance items carried out conditionally and specifically based on the equipment status, system features and operation conditions of the unit.

Strengthening the Guarantee of Heating Safety

With earnest implementation of the requirements of China and industry regulators on heat supply, the Company has established a leadership team for power and heat supply guarantee in a timely manner, arranged a supply-guarantee plan, conducted daily supervisions, weekly supervision and monthly summary, made assiduous efforts in ensuring the security of supply-guarantee funds, and promoted the implementation of various measures. All the subsidiaries resolutely shoulder their political and social responsibilities, source coal through various channels, strengthen equipment maintenance, and strictly implement instructions of power grid dispatching, with 220 coal-fired power generator units operating as per requirements of such instructions. By doing so, the Company has fully performed its responsibilities and duties. In addition, the Company has also taken the following measures to strengthen the guarantee of heating safety.

1. **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.

2. **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.

3. **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.

4. **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.

5. **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.

6. **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 2021, 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 safety production of the Company's system overall maintains stable. The Company always considers flood relief and stable supply of power and heat as highly urgent political tasks, assumes duty to guarantee energy consumption for people's livelihood, and resolutely overcomes the adverse effects of the continuous sharp increase of coal prices and lower-than-cost price. The Company resolutely shoulders and implements the political responsibility of guaranteeing the security of electricity and heat supply and flood control.

In October 2021, the strongest autumn flood occurred in Shanxi since the meteorological records. Zuoquan Power Plant responded promptly by deploying an emergency rescue team of 30 people, preparing sufficient supplies for flood relief and pandemic prevention, and actively participating in road rescue and the evacuation of victims. The Zuoquan power plant made every effort in the temporary maintenance and flood control of No.1 Unit, carefully eliminated defects of equipment, performed trial operation of the system, and enhanced fuel transfer to ease the pressure on inventory and guarantee supply security for this winter and the next spring.

Yushe Power Plant, Dongshan Thermal Plant, Shanxi Comprehensive Energy Company and other subsidiaries strictly implemented the emergency plans for flood control and power guarantee, distributed flood relief supplies, strengthened the inspection of key points, and rectified the findings in a timely manner to ensure the reliable operation of equipment and effective response to flood hazards.

Successfully Guaranteeing Energy for Important Periods

In 2021, under the unprecedented pressure in fuel supply guarantee and the conditions of supply shortage and sharp rise of coal prices, the Company strengthened organisational leadership, increased procurement through multiple channels, set the target for annual inventory control, and ensured the fulfilment of the responsibility of fuel supply guarantee. Working tenaciously, collaboratively, resolutely in the front of fuel supply, we shouldered the political responsibility of fuel supply guarantee, successfully handled the peak power consumption in summer, and guaranteed the fuel supply for the 100th anniversary of the founding of the Communist Party of China ("CPC"), the peak power consumption in winter, and other important and special occasions and periods.

In addition, during important periods such as the beginning of the year and the Spring Festival, the Company took various production safety measures to ensure safe and stable power production and reliable heat and steam supply:

1. **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"[11], strengthened operation management and routine inspection, improved equipment defect management and attached great importance to equipment defect elimination.

2. **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.

3. **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.

4. **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.

5. **Continuing the pandemic prevention and control.** We strengthened the pandemic 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.

[11] Two Tickets and Three Systems: work ticket and operation ticket; shift system, patrol inspection system and the system of periodic test and rotation of equipment.

4.2 Sparing no Effort in Compliance Management

Huaneng International continuously enhances its anti-corruption efforts, insists on clean and honest business practice, established a law-abiding corporate governance. We closely monitor 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 is committed to operational compliance, regulated operation to continually improve its risk prevention ability and corporate governance, and building a corporate culture that values integrity and compliance.

4.2.1 Management by Law

In 2021, upholding Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, the Company thoroughly implemented the strategic plan of the CPC Central Committee on comprehensively advancing the rule of law. Under the unified leadership of the Party committee and management of the Company, the Company comprehensively advanced the rule of law and deepened reform of the rule of law by improving the management of compliant operation, enhancing the capability of the team engaged in the rule of law, and promoting the awareness of the rule of law.

Improving the Corporate Governance Structure

After years of exploration and practice, the Company has continuously improved its modern governance system and governance capability in accordance with the requirements of the modern enterprise system, forming a standardised and sound corporate governance structure. We have established and improved the corporate governance structure consisting of the shareholders' meeting, the Board of Directors, the Board of Supervisors, and management, and continuously improved the system of decision-making, execution and supervision on the basis of equal rights and responsibilities, coordinated operation, and effective checks and balances.

Strengthening the Mechanism of Litigation Risk Prevention and Control

The Company insistently strengthens the management of litigation and disputes, and supervises the handling of the cases carried over from the past following a problem-oriented approach. For the significant cases that have impaired the Company's reputation or caused heavy losses, the Company strengthens coordination and urges relevant subsidiaries to make active and responsible response. The Company has strengthened the management of filing and statistics of litigation cases, conducted the analysis of cases and results, checked weak links in the system and management, improved the system and the management.

Enhancing the Review of Legal Issues

Attaching attention to solving the difficulties of reform with a thinking and methodology based on the rule 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. The Company improved its comprehensive capability of reviewing legal issues and enhanced the review of issues related to significant decision-making, regulations and systems, asset disposal, capital operation, legal authorization, contracts and business administration, etc., to ensure that all operations would be carried out in a lawful and reliable manner. By promoting the integration and the interfacing of the legal management information system and other business operation systems, the Company fully exploits the management efficiency of the information system, and continuously increases the application range of the information system.

Improving Staff's Awareness of Laws by Various Activities

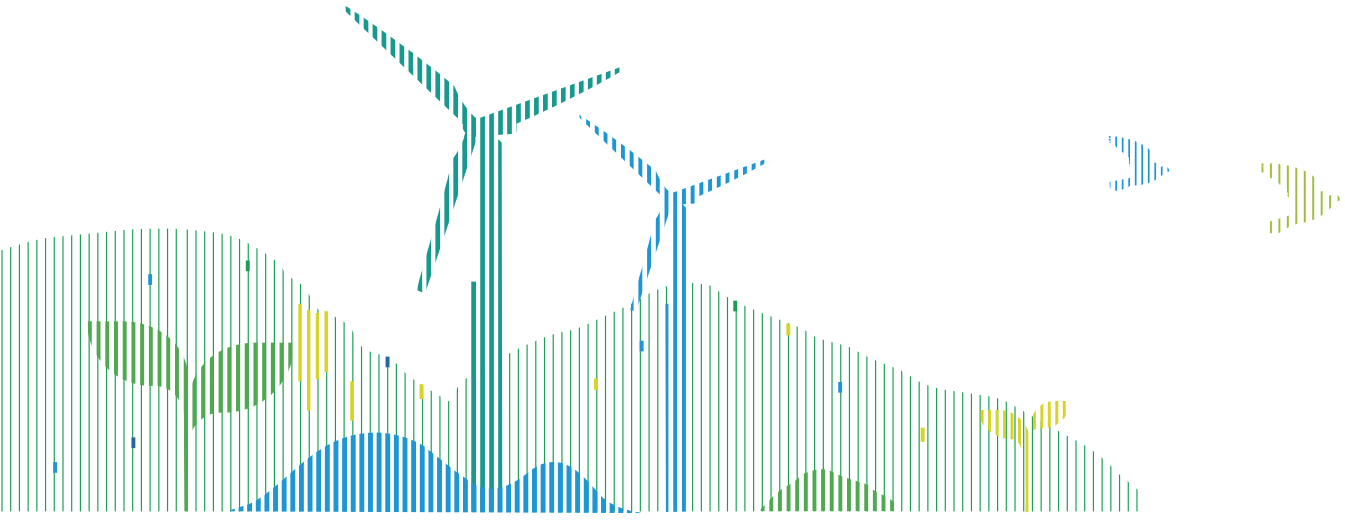
The Company persistently carries out in-depth publicity and education to improve staff's awareness of laws, innovates new forms of publicity, and properly designs such publicity and education with solid results obtained. In 2021, under the guide of Xi Jinping Thought on the rule of law, in light of the requirements of the CPC Central Committee, relevant governing departments and superior authorities and the Company's need of improving staff's awareness of laws, the Company has formulated the Eighth Five-Year Plan for Law Publicity and Education (《開展法治宣傳教育第八個五年規劃》), planned and carried out law publicity in a systematic manner. The Company keeps a close watch on promulgation of new laws, and comprehensively studies the laws and regulations related to corporate governance. A series of briefings on the new laws were released via online columns for the purpose of further publicising the laws and regulations such as the Securities Law (《證券法》), the Company Law (《公司法》), the Administrative Measures for the Disclosure of Information of Listed Companies (《上市公司信息披露管理辦法》), the Guidelines for the Implementation of Affiliated Transactions of the Shanghai Stock Exchange (《上交所關聯交易實施指引》), etc. The Company continues to pay attention to the trends of regulations in New York, Hong Kong and Shanghai, and incorporates new regulatory requirements and policies into its plan of law publicity in a timely manner. We have established a high-quality and efficient platform of law publicity, which legally guarantees the standardisation and institutionalisation of the Company's information disclosure system.

The Company has always attached importance to the publicity of the Civil Code (《民法典》) since its promulgation, and profoundly studied and publicised the basic principles and main contents of the Civil Code. On the one hand, the Company insists on integrating the publicity of the Civil Code with the corporate governance. According to its own situation and the needs of law publicity, the Company timely reminds all the departments of the Company of the potential risks in the Company's operation and management after the implementation of the Civil Code by reminder letters and legal opinion letters in order to control risks in advance and safeguard the legal rights and interests of the Company. On the other hand, the Company insists on integrating the publicity of the Civil Code with ongoing learning. The Company distributed the books of Civil Code of the People's Republic of China (Practical Version) (《中華人民共和國民法典(實用版)》) to every employee at the headquarters for their daily use and improving their awareness of law. Meanwhile, the Company makes full use of the internal network platform to assiduously carry out online courses regarding the Civil Code, achieving solid results of learning. By doing so, the staffs have obtained deep understanding of the Civil Code with Chinese socialism characteristics.

4.2.2 Anti-corruption

In 2021, 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 (《中華人民共和國監察法實施條例》), 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 assiduously carried out conduct improvement and anti-corruption campaigns, urged all employees to uphold ethics as well as Party disciplines and state laws and created an atmosphere where everyone remained disciplined, abided by the law, discharged duties in a standardised fashion, and practised clean operation so as to provide a solid political, ideological organisational and disciplinary support for the Company's sustainable business development.

In 2021, the number of lawsuits on corruption raised and concluded against the Company or its employees was zero.



Implementing the Responsibility System for Conduct Improvement

1. The Company held the 2021 conference of conduct improvement and anti-corruption campaigns.
2. The Company formulated and issued the Key Task Division Plan for Conduct Improvement and Anti-corruption Campaigns of the Company's Party Committee for 2021 (《公司黨委2021年黨風廉政建設和反腐敗工作重點任務分工方案》) which broke down the annual conduct improvement and anti-corruption campaigns into 25 specific tasks and defined the division of responsibilities.
3. All the departments and offices signed totally 12 letters of commitment to integrity for 2021 under the organisation of the Company, and carried out the segregation of duties for conduct improvement among staff at all levels.
4. The Company restructured the leadership group for conduct improvement and anti-corruption campaigns in a timely manner based on the adjustment of the Company's internal structure, personnel changes and actual needs.
5. The Company held the specific report meeting to collect work reports from management personnel, the discipline inspection committee and various departments and offices with respect to the management, supervision and execution.

Strengthening Daily Supervision and Targeted Supervision

1. The Company battles against "power-related misconducts". The Company endeavours to improve the long-term mechanism, and has formulated 21 preventive measures against "power-related misconducts" and promoted the effective implementation of such measures. The Company organised warning education targeting at the "power-related misconducts" for the staff engaged in engineering, technology and economy.
2. The Company strengthens the supervision of the "top leaders" and the leadership team. The Company has promoted the implementation of system that the "top leaders" are subject to the overall responsibility and supervision while the subordinates at each level are subject to their respective responsibilities and supervision.
3. The Company has established the integrity archives of middle-level management cadres of the Company's Party committee and implemented dynamic management.
4. The Company strictly assesses the integrity when appointing and promoting cadres to prevent the promotion or appointment of any cadre with improper conduct.
5. The Company strengthens the risk prevention and control of overseas projects. The Company carried out special training on integrity for the staff of Tuas Power, and organised course and publicity of Beijing Initiative for the Clean Silk Road (《廉潔絲路北京倡議》) and The United Nations Convention Against Corruption (《聯合國反腐敗公約》), so as to continue to improve overseas staff's awareness of integrity.

Strengthening Integrity Campaigns

1. The Company sends integrity message at important moments. On major holidays such as the New Year's Day, the Spring Festival, the Labour Day, the Dragon Boat Festival, the Mid-Autumn Festival, and the National Day, we send integrity messages to the Company's employees to urge cadres at all levels to uphold integrity, frugality, and high moral standards.

2. Based on the typical cases of violating the eight-point decision on improving work conduct announced by the CPC Central Commission for Discipline Inspection and the National Supervisory Commission, we strengthen warning education to enhance cadres' awareness of practising the eight-point decision on improving work conduct and the relevant implementation rules on their own initiative.

3. The Company vigorously rectifies the formalism and bureaucratism. Through daily supervision, we thoroughly identify the formalism and bureaucratism, so as to take serious measures for rectification.

Conducting Warning Education on Integrity

1. The Company practically carries out disciplinary interviews under the "four forms". We urge all departments and offices of the Company to carry out disciplinary interviews under the "four forms" as required. Throughout the year, 22 routine interviews with principals of different departments and offices were conducted by the Company's discipline inspection teams, and 73 with personnel under different departments and offices by the principals.

2. The Company holds onto the warning education on integrity. During the year, 7 warning educations were conducted for cadres and personnel in key positions, with an attendance of more than 750 person times, through which we further raised employee awareness of self-discipline and integrity, and laid a solid foundation for uprightness and entrepreneurship.

Facilitating the Construction of Discipline Inspection Teams

1. In order to strengthen the standard management of discipline inspection, we have formulated the Rules for the Discussion and Deliberation of the Discipline Inspection Commission (《公司紀委議事規則》) and the Rules for the Implementation of Discipline Inspection of the Discipline Inspection Commission (Trial)(《公司紀委執紀工作實施細則(試行)》), further specifying working procedures of the Discipline Inspection Commission, for discussion and deliberation, and handling of complaint letters and visits and clues to the problems.

2. The Company intensifies training for full-time and part-time discipline inspection personnel. We organised 7 trainings on discipline inspection and supervision for discipline inspection personnel, and distributed training materials for them to consistently improve their political awareness of and competence in discipline inspection.

3. The Company rigidly follows the requirements of discipline inspection to strengthen self-supervision. Through intensive education, daily work exchanges, and routine interviews, we conduct strict education, management and supervision on discipline inspection personnel to prevent any unnoticed corruption practices.

4.2.3 Protection of Intellectual Property Rights

The Company, in an all-round way, strengthens the protection of intellectual property rights, and implements the Plan on the Development of Intellectual Property Rights Power (2021-2035) (《知識產權強國建設綱要(2021-2035年)》) to facilitate and consolidate the high-quality development and technological innovation. We have been constructing and improving a system to protect intellectual property rights. Supported by the Measures for the Management of Technological Intellectual Property Rights (《科技類知識產權管理辦法》) released earlier this year, the Company has further rolled out relevant requirements and policies for intellectual property rights agency to open channels for patent application, guarantee the efficiency of patent application, and consolidate the coordinated development of "quality" and "quantity" of patents. Sticking to the goal of strengthening patent innovation and protecting patent rights, we launched a special project for patent enhancement, and coordinated patent application and renewal based on the Company's management, further standardising the management, development and application of intellectual property rights, refining the protection mechanism for technological achievements and facilitating the formation and transformation of technological innovation and proprietary intellectual property rights.

In 2021, 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》), the Rules for the Implementation of the Patent Law of the People's Republic of China (《中華人民共和國專利法實施細則》), the Regulations for the Implementation of the Copyright Law of the People's Republic of China (《中華人民共和國著作權法實施條例》), the Detailed Rules for the Implementation of the Trademark Law of the People's Republic of China (《中華人民共和國商標法實施條例》) 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 the Company's secondary unit division and the chief engineer took 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

The Company actively conducts research on the compliance management of intellectual property rights. We organise patent work trainings within the system and complete the patent application and protection as well as the trademark protection and publicity 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

The Company attaches great importance to the protection and maintenance of intellectual property rights. We require all units to strictly follow relevant laws, regulations and policies, timely revise the Measures for the Management of Trademarks and Fonts of the Company (《商標及字號管理辦法》) as required by the management to strengthen the protection for intellectual property such as core technologies, technical secrets, trademarks and fonts, and prudently decide on the transfer and licensing of core intellectual property rights. In addition, we further enhance all-round management of core technical secrets and business secrets, and reinforce competition restrictions on key talents knowing the Company's core technology secrets. With respect to intellectual property rights of others, we, adhering to the principle of full respect and proper use, define the use, methods, prohibited acts and liability for breach through a license agreement to use such intellectual property rights in a legal and compliant manner. We establish and improve the coordination mechanism between intellectual property rights agencies and Legal Department of the Company so as to better deal with disputes arising from intellectual property rights, enhance risk control and establish a multi-level intellectual property protection system.

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.

TRANSFORMATION DEVELOPMENT DRIVEN BY INNOVATION





05

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, boosts the development of the green management system, so as to promote the green development of the Company.

Transformation Development Driven by Innovation

5.1 Accelerating the Green Development

"Innovation, coordinated development, green growth, open economy and shared development" are the five key development concepts of our country. President Xi Jinping has stated the goal to have CO_2 emissions peak before 2030 and achieve carbon neutrality before 2060, and the Chinese government's response to climate change has been accorded as a major strategy for national economic and social development. The country vigorously develops a green economy and earnestly promotes various emissions reduction measures as core climate change policies.

The "14th Five-Year Plan" period is the first five years of a new journey towards building China into a modern socialist country in an all-round way, the start of a new normal in China's economic and social development, as well as 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 by 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 to accelerate the green development.

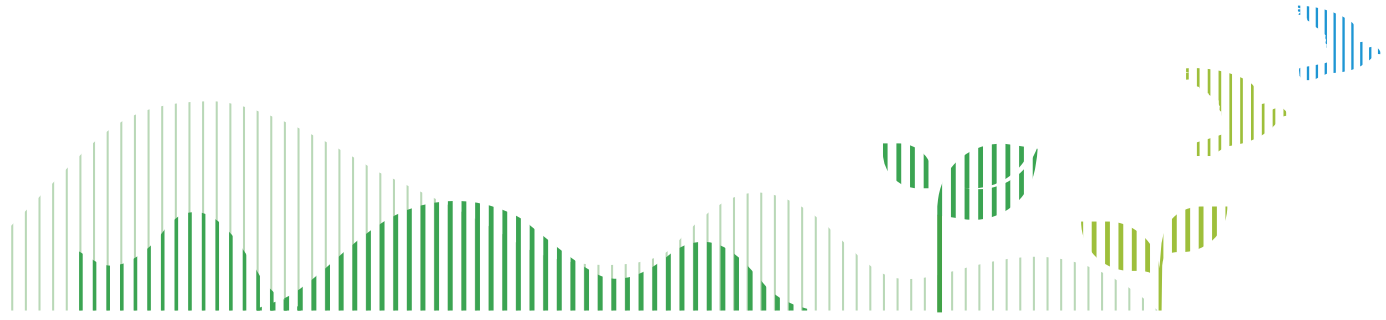
Optimising the Energy Structure Constantly

In 2021, moving towards the goal of "carbon peak and neutrality", Huaneng International focused on promoting low-carbon clean energy development, continuously improved the proportion of installed capacity of low-carbon clean energy, and vigorously facilitated the development and construction of new energy projects such as PV and wind power generation, achieving a larger increase in the low-carbon clean energy installed capacity.

During the "14th Five-Year Plan" period, the Company has been optimising the energy structure. In detail, we coordinate energy security and green development, deepen the supply-side structural reform to thoroughly drive the high-quality development and accelerate the leap-forward development of new energy, and speed up the optimisation and upgrading of the coal power structure.

Sticking to the goal of carbon peak and neutrality, the Company promotes the green and low-carbon energy transformation. On the one hand, we adopt renewable energy sources and vigorously develop new energy resources to build a new power system with new energy as the main body. On the other hand, we transform to develop coal power, prioritise gas and other clean energy power generation, and actively plan pumped storage power generation to achieve an integration of sources, network, loads and storage and a pattern of multi-energy complementary development.

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. 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, optimally planning pumped storage power stations, and promoting the development of pumped storage power stations. The Company does well in site protection and resource reserve while taking a large proportion of shares in Hainan Changjiang Nuclear Power Plant Phase I, Shidao Bay Nuclear Power Plant and Xiapu Nuclear Power Plant. We pay close attention to the application of other new energy sources for power generation, and 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 and adheres to the principle of "adopting centralisation and decentralisation and focusing on self-sustaining development ", pays equal attention to independent development and acquisition, and strives to gain resources that match its market share. The Company continued to focus on green development, vigorously developed new energy and make full use of the favourable conditions for the centralised development of renewable energy in the country's "Three-North", coastal, south west and part of the central China, and further built an energy base of "base type, clean type, complementary type, intensification, digitalisation, and standardisation". The Company developed and construct offshore wind power bases in areas such as Guangdong, Jiangsu, Zhejiang, Shandong and Liaoning, and actively planed a new model of scattered and distributed development throughout counties. The Company optimally developed gas power and other clean energy power generation, and steadily developed pumped storage power generation to promote the development of pumped storage power stations by taking into account the peak load distribution demand of the receiving end of the clean energy bases. Besides, the Company actively implemented major regional strategies of the State, such as Guangdong-Hong Kong-Macao Greater Bay Area, Yangtze River Delta and Beijing-Tianjin-Hebei, to integrate ourselves into the new development pattern.

Huaneng Shandong Peninsula South No. 4 Offshore Wind Power Project

On 10 December 2021, all 58 wind turbines of the Huaneng Shandong Peninsula South No. 4 Offshore Wind Power Project, the first offshore wind power project in Shandong Province, were connected to the grid for power generation. Located in the southern waters of Haiyang City, the project, as one of large offshore wind farms with the deepest single-pile foundation in China, has a total installed capacity of 300 thousand kilowatts and 30 MW/60 MWh energy storage devices. With an estimated annual power generation capacity of 821 million KWh after being put into operation, the project can effectively save 246.30 thousand tons of standard coal, and reduce carbon dioxide emissions by 640 thousand tons. This project is of great significance for Shandong Province to replace old growth drivers with new ones and achieve the goal of "carbon peak and neutrality".



Huaneng Shandong Peninsula South No. 4 Offshore Wind Power Project

Huaneng Zhejiang Qinggang PV Power Station

On 17 December 2021, Huaneng Zhejiang Qinggang PV Power Station, the first domestic intertidal-zone full-scale fishery-PV eco-power station invested and constructed by the Company, was connected to the grid for power generation. Located in the waters near Qinggang Town, Yuhuan City, Zhejiang Province, the project has an installed capacity of 130 thousand kilowatts and an estimated annual power generation capacity of 150 million KWh, equivalent to saving about 45 thousand tons of standard coal and reducing carbon dioxide emissions by more than 110 thousand tons per year.



Huaneng Zhejiang Qinggang PV Power Station

With PV panels installed on supporting brackets for the upper structure, and permeable structures as the pile foundation for the lower structure, the project would not affect the natural quality of the waters. In addition, mangroves were planted around to restore the natural ecology and functions of the intertidal zone. After completion, the three-level power station, that is, the top for high-efficiency power generation, the middle for biological carbon sequestration and the bottom for full-scale aquaculture, has become the first domestic PV power station with blue carbon sinks for the ecological management of coastal intertidal zones, greatly improving ecological benefits and setting an example for large-scale green development of coastal intertidal zones.

5.2 Breakthroughs in Independent Innovation

Technological innovation drives business development. Huaneng International is committed to becoming 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.

Innovation Management

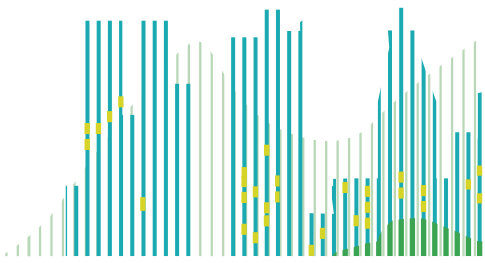
The Company implements the new development concept in an all-round way. We earnestly implement the decisions and arrangements of the central government and the SASAC on technological innovation, thoroughly practise the technological innovation strategy, and vigorously embrace the challenges and opportunities in technological innovation arising from the "carbon neutrality" and the new round of revolution in the energy industry. In alignment with the strategy of serving the country and the major demands for the Company's development, we improve our competence in independent innovation and significantly raise the industrialised level of technological achievements by adhering to make breakthroughs in key technologies, focusing on improving innovation systems and mechanisms, and relying on strengthening the construction of technological talent teams and innovation platforms. In addition, we take the lead in technological innovation to support and usher in the high-quality development of the Company, while accelerating the construction of an international first-class listed power generation company to promote the high-quality development of the domestic energy industry.

In 2021, 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 acceptance inspection organised by the Ministry of Science and Technology (MOST). The "700^{O}C High-efficiency and Ultra-supercritical Power Generation Technology" is qualified for acceptance inspection. The project of "Optimal Design of Large-scale Offshore Wind Turbines and Key Components and Key Technologies for Mass Manufacturing, Installation, Debugging and Operation" has passed the mid-term acceptance inspection and is progressing as planned.

Secondly, we have made numerous technological breakthroughs in major and key scientific and technological projects such as the special project "1025". Two technologies from the automation of gas turbines have been included in the Catalogue for the Recommendation on Scientific and Technological Innovation Achievements of Central Enterprises (《中央企業科技創新成果推薦目錄》). We have made key breakthroughs in the industrialisation of high-temperature materials. With respect to network security, a complex laboratory for power infrastructure network security has been established. The project of "Carbon Dioxide Capture, Improvement and Verification through Key Technologies – Yangpu 1,000 TPA of Carbon Dioxide Capture" has completed major design tasks and part of the site piling. The project of "Development and Demonstration of 100 KW Molten Carbonate Fuel Cell Power Generation System" has conducted volume production of bulk materials of cell stacks. In addition, the Company established 5 key scientific and technological projects such as the "Research and Simulating Industrial Verification on Key Technology of Xinjiang High Alkali Coal Wet Bottom Boiler for Combustion" to strengthen the research and application of new energy-saving technologies. We have also organised the "Exchange on Advanced Technology of Work Safety, Energy Saving and Emission Reduction", applying 34 advanced technologies and achievements to work sites, so as to promote work safety, drive energy saving and emission reduction, and support high-quality development through technological innovation.

In 2021, the Company's R&D investment increased significantly, and more than 2,400 patents were authorised during the year, including 80 invention patents.



Innovation Achievements

1. The project of "High Alkali Coal Wet Bottom Boiler" has passed the 168-hour full-combustion high alkali coal testing at Yangliuqing Thermal Power Plant with good results. The project has passed the acceptance inspection organised by the MOST.

2. With respect to offshore wind power, the verification project on key technology of 5 MW and 6 MW wind turbines has been launched.

3. With respect to network security, we have developed the first supporting system for online network security risk management and control in the power generation industry, and built a flexible and reconfigurable power infrastructure network security laboratory connecting real systems constructed by physical devices with virtual systems.

4. Two proprietary technologies from the automation of gas turbines, that is, the failure analysis and the non-destructive testing and evaluation for key components of gas turbines, have been included in the Catalogue for the Recommendation on Scientific and Technological Innovation Achievements of Central Enterprises (《中央企業科技創新成果推薦目錄》).

5. With respect to high-temperature materials, we have made key breakthroughs in industrialised technologies such as high-purity melting, homogeneous control, and thermal moulding of thick-walled large pipes and high- and medium-pressure rotors.

6. The supercritical carbon dioxide power generation project has passed the system-wide heavy-load 72-hour trial operation, and has been officially put into operation.

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 with a focus on clean combustion, network security, automation of gas turbines, 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 policy on "carbon peak and neutrality", a number of scientific and technological achievements with significant impact 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 Consumption Reduction Solidly

In 2021, 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 effectively 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 generating units' outstanding performance. In 2021, the Company did not incur any environmental accident that was defined as major or above grade.

5.3.1 Overall Planning

Committed to an industry leader in overall energy consumption efficiency and ultra-supercritical unit energy consumption efficiency, Huaneng International has formulated rules and regulations, such as the Measures for Energy Saving Management (《節能管理辦法》), the Regulations on Environmental Protection Management (《環境保護管理規定》), the Standards and Acceptance Measures for Energy Saving and Environmentally Friendly Coal-Fired Power Plants (《節約環保型燃煤發電廠標準及驗收考核辦法》), and the 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》). Various systems of energy saving are specified by each unit of the Company according to their actual circumstances, and publicity, training, supervision and inspection are carried out in a timely manner as well. 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 lead in energy conservation and environmental protection and maintain its competitive advantage, and contribute to the reform of the national energy production and consumption and enhance 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》), the 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 during its development.

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 2021, the Company's coal consumption rate for thermal power units was 290.69 g/kWh. The house consumption rate of plants was 4.34%. The annual consumption of standard coal was 13,200.22 ten thousand tons. Oil consumption in production totalled 37,709.02 tons, while natural gas consumption was 581,655.30 ten thousand standard cubic metres.

Management Objective

Through multiple measures, the Company strives to reduce the coal consumption rate for thermal power units by about 5 g/kWh compared with 2020 and below 286 g/kWh by 2025.

Management Mechanism

The Company's regional branches are responsible for the energy saving management. In accordance with the Energy Conservation Law of the People's Republic of China (《中華人民共和國節約能源法》), and with the consideration of actual operations, we have formulated regulations and guidance related to energy saving, such as the Measures for Energy Saving Management (《節能管理辦法》), the 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》), the Standards for Energy Saving and Environmentally Friendly Coal-Fired Power Plants (《節約環保型燃煤發電廠標準》), the 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》).

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 the 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 define specific control measures.

In terms of target management and control, the Company maintains its leading position in energy consumption indicators by vigorously developing heat supply renovation, implementing energy-saving projects and practising effective energy-saving management measures. Huaneng International strengthens the budget management of energy consumption indicators and has formulated special assessment regulations to ensure that each unit can achieve optimal consumption of coal, electricity, oil, natural gas. 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. 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 according to specialties and systems, 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 maintain the leadership in energy saving.

Management Measures

In 2021, the Company continued to meet stringent key energy consumption performance targets and focused on energy saving and consumption reduction measures in three areas, namely management, structure and technology. 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 units and introduced energy saving benchmarks into grassroots units' 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 tech-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 units modulate 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 2021, the Company's overall energy saving indicator and the energy consumption indicators 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. 52 generating units won the awarded prizes in the China Electricity Council thermal power generation unit energy efficiency benchmark. In the special evaluation of energy consumption indicators, 11 generating units of the Company were rated as the units with the best coal consumption for power supply or plant power consumption rate.

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.

In 2021, 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, and the unplanned outage times of generating units decreased year by year. In terms of energy saving and consumption reduction, the coal consumption for power supply decreased by 0.39 g/kWh year-on-year, and the energy efficiency of thermal power units remained industry-leading for many years. The Company paid close attention to optimising the energy consumption and achieving the environmental protection targets, and stepped on a new journey of high-efficiency and low-carbon development. 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 addition, the Company consistently drove the green and low-carbon development.

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.

Huangtai Power Plant – Driving Jinan's Development through Power Supply

Huangtai Power Plant established a leading group for energy conservation to structure a robust three-level management network for energy conservation, actively carry out energy audits, clean energy production, as well as review and certification of cogeneration units, and implement the management responsibilities for energy conservation. In addition, the Plant attached importance to breaking down and implementing energy consumption indicators, carried out various publicity activities, contests and benchmarking, and quantified rewards and punishments to establish and improve online energy monitoring systems such as the "plant-level monitoring information system for thermal power plants". In 2015, ultra-low emission was achieved in the Plant's four sets of generating units, and the high back pressure heat supply renovation and the zero-output transformation of low-pressure cylinder of steam turbines were successively completed, significantly increasing the energy saving and emission reduction capacity of the units, and realising the shift from old growth drivers to new ones. The Plant's quality of flue gas emissions is far better than the national standard. The existing four generating units stay the leading position in major energy consumption indicators. The Plant's coal consumption for comprehensive power generation is lower than 300 g/kwh. Among the four generating units, No. 7 and 8, which have been in operation for 30 years, have won the first prize for energy efficiency benchmarking among similar units in China for the sixth consecutive year since 2016.



Huangtai Power Plant





National First Prize Certificate for Energy Efficiency Benchmarking of Similar Units

Qinbei Power Plant #6 Unit Comprehensive Energy Saving Renovation Project Connected to the Grid and Generated Electricity

On May 27, 2021, Huaneng Qinbei Power Plant #6 unit comprehensive energy saving renovation project was connected to the grid and generated electricity, running stably. The transformation maximized the operation safety, economy and flexibility of the unit, and the economic indicators exceeded the leading level of the unit with the same capacity in China. The project uses modern advanced turbine design technology to redesign all components of the high, medium and low pressure flow parts of the turbine, to give full play to the advantages of multi-stage reaction technology, reduce enthalpy drop at all levels, appropriately increase the flow series and improve cylinder efficiency. The intake of steam adopts the structure form of full-circumference intake + supplementary valve to improve the intake efficiency; AIS seal design system is adopted to reduce the loss of steam leakage.



Huaneng Qinbei Power Plant

5.3.3 Water Resources Management

The Company strictly followed the government's requirements for the protection of fresh water and issued the Guiding Opinions for Thermal Power Plant's Water Saving and Wastewater 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 wastewater treatment work. The main water consumption of Huaneng International is 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 2021, the overall water consumption of the Company was 23,126.31 million tons, the fresh water in power generation was 361.16 million tons, the open cooling circulation water was 22,765.15 million tons, and the performance value of consumption of fresh water in power generation was 0.79 kg/kWh.

Management Objective

By 2025, the Company is committed to devoting greater effort in the transformation of water conservation for the purpose of zero discharge of wastewater.

Management Mechanism

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:

1. A water management system has been established and managed by specific personnel, who shall formulates 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.

2. 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.

3. 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 2021, Huaneng International launched the water saving and wastewater treatment work plan in its power plants. 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 the Standards for Energy Saving and Environmentally Friendly Coal-Fired Power Plants of the Company (《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.

In 2021, 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 Wastewater 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, Weihai Power Plant's seawater desalination project has been put into operation. The projects of water saving and 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 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. In addition, the ultra-low emission transformation, water saving and wastewater treatment, 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. We strengthen the operation, maintenance and repair of environmental protection facilities, and 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, and 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"[11] for environmental protection, 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.

[11] Three Simultaneities: Simultaneous design, simultaneous construction, simultaneous use

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 28,712.24 tons, 58,347.32 tons and 3,636.08 tons respectively, with emission performance values of 0.07 g/kWh, 0.14 g/kWh and 0.01 g/kWh respectively.

Management Objective

The Company is committed to enclosing all major coal yards of 19 coal-fired power plants in Beijing-Tianjin-Hebei and neighbouring "2+26" cities, with local environmental protection fugitive emission requirements to be implemented strictly. It is expected that the Company's ultra-low emission unit capacity will reach 100% in 2022.

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 all units 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 the environmental risk.

Management Measures

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

1. 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.

2. 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.

3. Successfully complete the air quality assurance 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 to fulfil the Company's social responsibilities.

4. 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.

5. 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, sulphur 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 2021, most of Huaneng International's coal-fired units have achieved ultra-low emissions, with the capacity of 99%. 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, and has maintained a stable ultra-low emission level and continued to outperform industry peers.

The COAP Research and Development and Pilot Testing Verification Project has Passed the Acceptance Inspection

On 7 May 2021, the COAP Research and Development and Pilot Testing Verification Project developed by Huaneng International has passed the acceptance inspection at Yueyang Power Plant. Through the project, multiple pollutants in flue gas can be removed at one time, achieving "near-zero emissions". Compared with conventional technologies, no limestone, urea and denitration catalyst are required for the COAP technology, and sulphur and moisture in flue gas can be recovered as well, maximising the utilisation of flue gas waste heat, with the operation cost basically equal to that of conventional technologies. Through the technology, flue gas emissions, namely sulphur dioxide and nitrogen oxides, are less than 1 mg per standard cubic metre; and dust emissions are less than 2 mg per standard cubic metre. The removal rate of sulphur trioxide, mercury, hydrogen chloride and VOCs (volatile organic compounds) is higher than 97%. The success of the COAP technology will support the leap-forward development of domestic coal-fired power plants from "individual pollutant control" to "multi-pollutant integrated control", from "ultra-low emissions" to "near-zero emissions", and from "resource consumption" to "resource reuse".



COAP

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, wastewater treatment, and ash field treatment for power plants, while expediting pollution prevention and control projects such as ultra-low emission renovation for clean energy heating units in the northern region.

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 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. 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, issued related regulations and systems and made timely amendments in accordance with changes in state policies to provide guidance and regulations for carbon asset management and carbon asset trading, etc. The Company has issued the Interim Measures for the Management of Carbon Emissions Trading (《碳排放權交易管理暫行辦法》), covering management institutions and their responsibilities, statistics and reporting of carbon emissions, trade preparation, trading and contract performance, development and trading of emission reduction projects and risk management, etc. 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) constantly improving the proportion of the installed power capacity using clean energy through adjustment of energy structure to reduce total carbon emissions.

2021 was the first year in which carbon trade market advanced into its full operational phase in China. According to the Administrative Measures for the Carbon Emissions Trading (Trial) (《碳排放權交易管理辦法(試行)》) issued by the Ministry of Ecology and Environment, the settled carbon emission quota of a performance unit in the current year should be greater than or equal to the actual carbon emissions in the previous year. Considering that the Company's contract performance of the carbon trade market in 2021 has not been completed, data relating to actual greenhouse gas emissions is considered as trade secrets until the contract performance is completed. Therefore, the relevant data is not disclosed in this report, until the contract performance is completed by the end of 2022.

Carbon Reduction Targets

The Company is to achieve peak carbon emissions as soon as possible through structural adjustment and energy saving and consumption reduction efforts.

Carbon Asset Management

The Company carried out the following work:

1. The Company actively responded to the national carbon emission market trading and provided feedback and suggestions with thorough study of key management rules and quota allocation plan for the carbon market to gain favourable policies;

2. The Company issued regulations on carbon trading management and aligned its carbon trading management model with the national carbon market;

3. The Company strengthened the centralised and professional management for carbon trade. All grassroots enterprises of the Company have appointed Carbon Asset Management to provide one-on-one training and assist them in completing carbon emission audits and carbon trading;

4. The Company organised data reporting, inspections and account opening, cooperated with system tests and actively participated in first batch of trading;

5. The Company prepared the contract performance plan based on the dynamic calculation on quota surplus and deficit and took advantage of CCER offset policies to reduce contract performance costs. Enterprises in the pilot regions successfully completed the national carbon market contract performance tasks for 2019 to 2020, meeting emission performance standards for the 8th consecutive year;

6. The Company organised business training concerning carbon trade and continuously improved the management capability on the carbon trade.

Performance in Carbon Trade Pilot Regions

In accordance with the national and pilot carbon market work arrangements, enterprises in Beijing, Tianjin and Guangdong continued to complete 2020 contract performance tasks in the pilot carbon market. The Company's grassroots units in the above pilot regions appointed Carbon Asset Management to conduct carbon emission audits and carbon emissions trading. All of them successfully met the annual carbon trading and contract performance targets in accordance with the pilot requirements of lead local agencies. All other regions were included in the national carbon market.

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 assist them in completing carbon emmision audits and carbon trading.

Actively participate in the policy study for the national carbon trading market. The Company 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.

Actively participate in the performance of carbon quota trade across the country and in pilot regions. The Company organised subordinate companies to perform calculation and allocation of carbon emission quota and completed contract performance of carbon quota as required.

Shanghai Shidongkou 120,000 Tons Per Year Phase-change Carbon Dioxide Capture Project

Relying on the CO_2 capture device of 120,000 tons per year, Huaneng Group Clean Energy Technology Research Institute Co., Ltd., Huaneng Shanghai Branch and Huaneng Shanghai Shidongkou Second Power Plant started the renovation of the phase-change carbon dioxide capture device in September 2021. Huaneng (Shanghai) Power Maintenance Co., Ltd. was responsible for the construction and completed the on-site renovation and acceptance on 10 December 2021. At the end of December 2021, after continuous and stable operation for more than 72 hours, the first phase-change carbon dioxide capture demonstrative device of 120,000 tons per year in China, developed by Huaneng Group Clean Energy Technology Research Institute Co., Ltd., was officially put into operation at Huaneng Shanghai Shidongkou Second Power Plant. The industrial verification would be carried out subsequently over phase-change carbon dioxide capture technology, along with a comprehensive assessment of key technical indicators under long operating cycle such as solvent loss, corrosion and degradation, and regeneration heat consumption. According to the calculation, the renovated device, compared with the original device, saves around 30% of the regeneration steam heat consumption. The device can produce 120,000 tons of liquid carbon dioxide per year with a purity of 99.7%, which can be used in food, chemical engineering and industrial manufacturing.



120,000 tons/year Phase-change Carbon Dioxide Capture Device

Future Plan

The Company will pay close attention to national carbon market policy issuance, actively participate in policy formulation and research, and make timely response plans for trading; continuously strengthen centralised and professional management of carbon trading and utilise collaborative resource advantages of marketing personnel to continuously explore the integrated operation strategies of the power-carbon market; organise the data reporting of carbon emissions, carbon trading and contract performance as required, continuously improve the technical support quality, and strengthen the supervision and management of carbon trading, ensuring the completion of national carbon market tasks as scheduled.

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 2021, the total water discharge of the Company amounted to 20,781.65 million tons, the discharge of open cooling circulation water totalled 20,755.11 million tons, and the total discharge of sewage (including industrial and desulphurisation wastewater) was 26.54 million tons. Some of these wastewater were allowed to be discharged when they reached a certain standard after treatment, e.g. wastewater 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 wastewater to be discharged to achieve zero discharge. In accordance with the national pollution prevention and control requirements, the Company rigorously implemented the sewage discharge licensing requirements and formulated the wastewater discharge transformation plan. Nearly 63% of the enterprises have started wastewater treatment, which is expected to be completed by 2022.

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

1. 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;

2. 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;

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

4. 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;

5. 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物污染環境防治法》) as well as the Company's regulations including the Regulations on Environmental Protection Management(《環境保護管理規定》), the Measures for Evaluation and Accountability for Environmental Protection Work(《環境保護工作考核及責任追究辦法》), the Management Standards for Solid Waste(《固體廢棄物管理規範》), the Governance and Management Standards for Desulphurisation By-products(《脱硫副產品治理管理規範》), the Governance and Management Standards for Fly Ash(《粉煤灰治理管理規範》), etc. The Company requires that the storage, discharge, and disposal of waste comply with national laws and local policies. We also cooperate with qualified third parties to deal with waste and strengthen waste recycling to minimise waste emissions.

Management Objective

In accordance with 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物污染環境防治法》) and in adherence to the principles of "reduction, recycling, harmlessness" in the prevention and control of solid waste pollution, the Company actively promotes the compliant and comprehensive utilisation of solid waste and insists on source management with whole-process responsibility system and traceable information management in place. The hazardous waste management plan is filed in accordance with regulations with such waste stored, transported and disposed of as required. The comprehensive ecological protection treatment and transformation for ash disposal area is expected to be completed by 2025.

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 4,707.38 ten thousands tons of solid waste, among them, 3,738.26 ten thousands tons of fly ash and cinder, and 969.12 ten thousands tons of desulphurised gypsum during the year of 2021 were generated. The comprehensive utilisation rate of fly ash and cinder stood was 92.20% and the desulphurisation gypsum disposal utilisation rate was 87.07%.

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 for fly ash and cinder, desulphurisation gypsum and other solid waste to effectively control the canning, stacking and marketing of fly ash and 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.

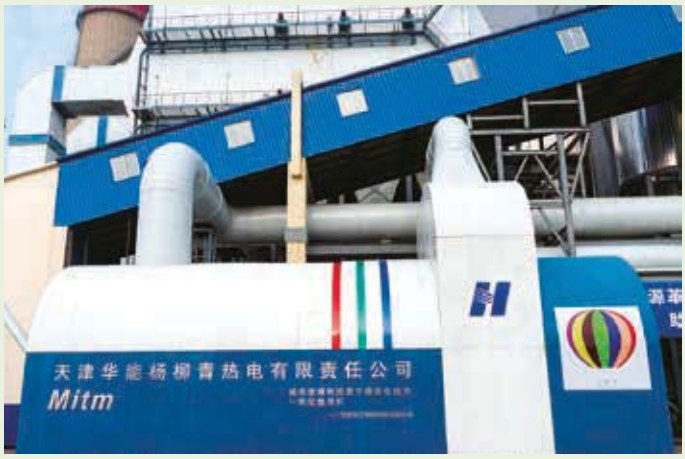
The power plants will temporarily place some fly ash and cinder on ash storage sites and the Company has implemented a rigorous control system to ensure the safety of ash dams and prevent seepage by carrying out regular assessment and inspection. In accordance with the requirements of local environmental 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.

Huaneng "Municipal Waste Pre-Drying Carbonisation Technology" was Successfully Applied in Industrialization for the First Time

On January 30, 2021, the coal-fired coupled sludge power generation project of Unit 5 of Huaneng Yangliuqing Thermal Power Plant passed EIA monitoring and officially entered commercial operation. This marked the first successful industrial application of "municipal waste pre-drying carbonisation technology" with independent intellectual property rights, which filled the gap in the field of sludge power generation in Tianjin and provided the best way for the reduction and harmless disposal of sludge in Tianjin.

The project adopts the "municipal waste pre-drying carbonisation technology" of Huaneng Changjiangxi Thermal Boiler Environmental Protection Company with completely independent intellectual property rights, and builds two sets of integrated processing systems with a processing capacity of 250 tons/day. The set of "drying, carbonization, grinding, transmission" is an organic whole, with simple process, short process, no secondary pollution such as waste gas, waste water. The products after incineration are discharged by the existing tail flue gas purification equipment of the unit, which can effectively handle bacteria, microorganisms, etc. in the waste, at the same time to prevent the formation of harmful substances such as dioxins.



Integrated Treatment Equipment for Municipal Waste Pre-drying Carbonisation Technology

The First Sludge-coupled Power Generation Project in Jining Was Put into Operation

On 21 December 2021, the No. 5 and No. 6 power units of Huaneng Yunhe Power Plant, the only pilot enterprise in Jining, successfully achieved continuous operation for 72 hours in the sludge-coupled power generation project, which was the second key application of the independent intellectual property rights "municipal waste pre-drying carbonisation technology" in the industrial construction. In the project, the sludge was dried and milled by extracting high-temperature flue gas from the boiler tail flue. The dried sludge then entered the hearth with the flue gas and was incinerated by the boiler. The incinerated product was purified by the flue gas purification equipment at the boiler tail and discharged after meeting the standard. The project was planned to dispose of 230 tons of municipal sludge per day and nearly 60,000 tons of domestic sludge per year, accounting for almost 40% of the total domestic sludge in Jining's urban area.

The sludge-coupled power generation project is an important practice of the Company in fulfilling its social responsibility. With utilisation of coal-fired thermoelectric power cogeneration units, the project achieves multi-path methods for sludge treatment that the sludge is disposed of in adherence to the principles of "harmlessness, stabilisation, resource recovery and greenisation", which can provide reliable support to the stable operation of urban sewage treatment plants, as well as contribute to the fight against pollution control and protection of the environment.



Sludge-Coupled Coal-Fired Power Generation Project of Yunhe Power Plant

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 relevant requirements, hire qualified agencies to deal with denitration catalysts that could not be renewable anymore, ion exchange resins that cannot be reused and hazardous liquid waste such as lubricant and other waste oil during operations. Besides, through managing the accounts, we will detail statistics on the amount of waste generated, the amount of disposal, and the audit of the qualifications of disposal units, etc., and strictly manage the generation and disposal of waste. In 2021, the Company, in the process of production and operation, generated 7,602.35 tons of denitration catalysts, 577.15 tons of ion exchange resin and other hazardous solid waste and 1,277.32 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》).

5.3.5.1 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 happens which causes excessive noise, the Company will conduct noise reduction transformations accordingly.

In 2021, the Company paid more attention to noise management and organised research project on "technical standards for noise control in coal-fired power generation projects", which could effectively guide the power plants to improve noise control after construction and renovation.

5.3.5.2 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.

5.3.5.3 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 or filing 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 earnestly implements relevant regulations to reduce impact on the surroundings, ensuring 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.

06

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 special rectification of 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 high-quality development of the Company.



SOLIDIFYING THE BOTTOM LINE FOR SAFE PRODUCTION



Solidifying the Bottom Line for Safe Production

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, and responsibility of safety is of the greatest significance". The Company aims to prevent production fatality accident, mishandling of operations with malicious intent, major equipment damage, serious and extraordinary serious 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 strengthen the red line awareness and effectively implement safe production.

The Company has identified five key safety management tasks for this year: (1) continuously carried out inspections and evaluations of the work safety responsibility system, ensured the establishment of a list of responsibilities for each post, standards for the work in place, and accountability mechanisms, sorted out, summarized, and notified common problems to encourage enterprises to make joint corrections; (2) promoted a dual prevention mechanism and made earnest efforts in the implementation of Guidelines for Classified Safety Production Risk Control (《安全生產風險分級管控導則》); (3) vigorously strengthened safety management in infrastructure construction and promoted an intrinsic safety management system in this regard; (4) learned from the accidents and focused on the weakness in outsourcing safety management and the system implementation, to enhance outsourcing safety management. Meanwhile, strictly controlled outsourcing personnel's entry, and enhanced rectifications for violations to ensure construction safety; (5) made thorough preparation for safe production in the flood seasons to get through the flood safely. The Company is committed to achieving the overall objectives of strengthening the implementation of safety responsibility, improving outsourcing management and enhancing natural disaster response capabilities through the above key tasks.

In 2021, there had been no significant violation identified in the Company related to providing a safe working environment and protecting the employees from occupational hazards. In 2021, the number of employee deaths due to duty was 1, with the ratio of 0.0017%. In 2019 and 2020, the number and ratio of employee deaths due to duty was 0.

6.1 Consolidating the Closed-loop of 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, which comprises intrinsic safety of personnel, process equipment, environment and management, including:

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 are required to have safety management knowledge and skills and lead by example, while employees are required to ensure safe operation by carrying out adequate controls. The safety behavior of employees should gradually change from passive to active, and we urged employees to act in accordance with rules and regulations, and show good safety behavior everywhere.

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

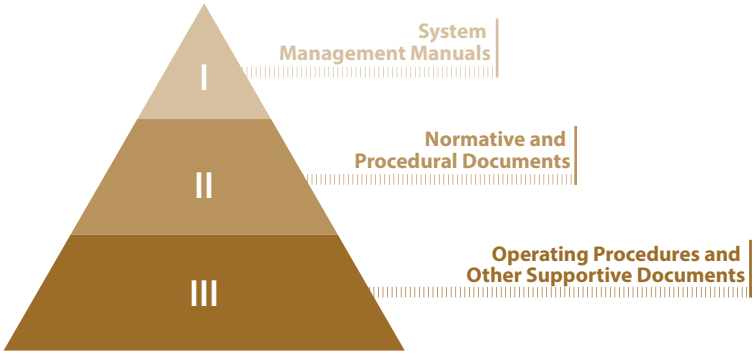
Intrinsic safety of management requires, under the condition of fulfilling national laws and regulations, companies' formulation and implementation of higher standards on safety, norms, and regulations, as well as their development of a comprehensive management system. In respect of safety management, we were transitioning from post-incident based to identification-based in addressing safety issues, and we were 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 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》) of the Company, etc.



In 2021, the Company continued to develop its Intrinsic Safety System:

1 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 Pandemic Prevention and Control (《疫情防控期間安全管理重點工作提示》), the Safety Production Priorities in 2021 (《2021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.

2 In line with the State Council Work Safety Committee's deployment, the Company implemented special rectifications for safety production, and formulated the Three-year Action Plan for Special Rectifications for Safety Production (《安全生產專項整治三年行動方案》). The Company vigorously managed the "Two Lists"[12] and carried out unannounced or uninformed inspections following the principle of "Site Visit subject to Four Noes"[13], timely reported issues and fulfilled responsibilities for the purpose of rectification and improvement on safety production management.

3 In order to enhance risk control and prevent safety risks, the Company issued and implemented 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 implemented 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.

4 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.

[12] "Two Lists" refers to the risk list and potential hazards inspection and clearance list.
[13] "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.

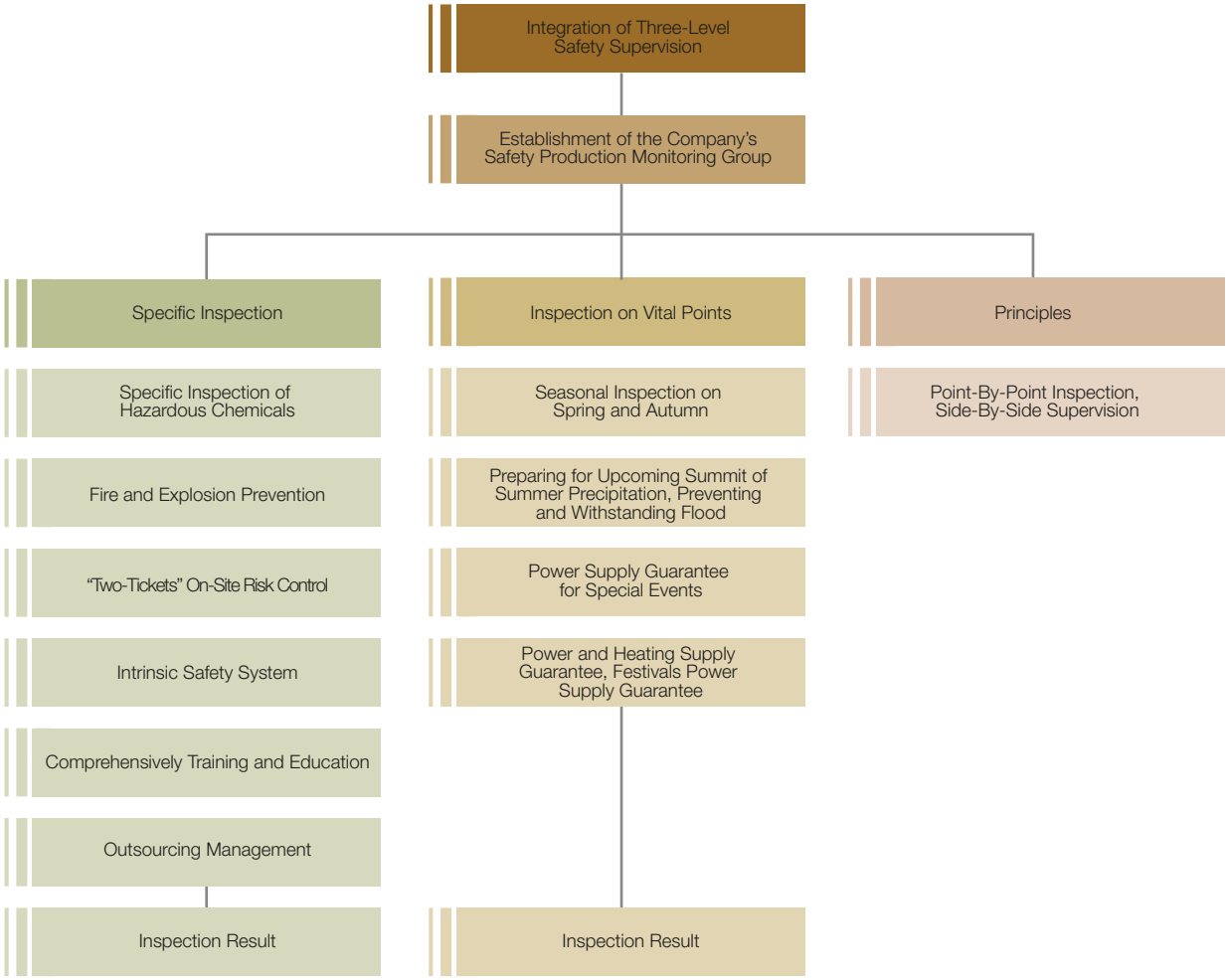
6.2 Consolidating the Foundation of Safety Development

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. 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.

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, and together with the safety protection mechanisms, ensure the accomplishment of safety production targets.



Safety Production Target Responsibility System

The Company and its subsidiaries have adopted a target responsibility system concerning production safety. Every year the Company's management and their subordinate unit's person in charge sign the Safety Production Target Responsibility Memorandum (《安全生產目標責任書》) and carry out monthly pre-assessment and yearly final assessment to guarantee that the responsibilities are fulfilled at each 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 for which the Company is responsible, 100 points will be deducted.

6.3 Adopting Vigorous Safety Measures

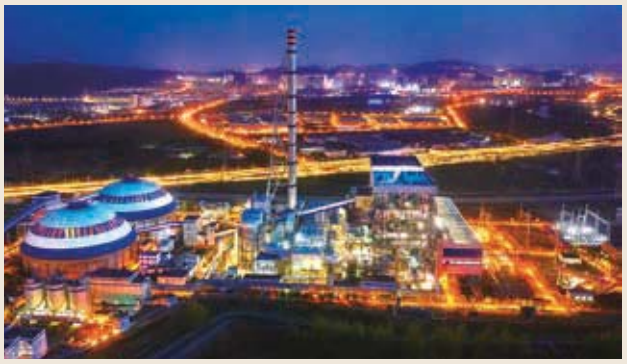
Huaneng International sees safe production as paramount. The Company has taken comprehensive and effective measures in system improvement, risk control reinforcement and emergency management through the responsibility system to promote the implementation of safety production, and solidly implemented special rectifications for safety production, contributing to the continuous enhancement of safety production.

Overall Production Safety

Facing COVID-19, the Company made concerted efforts for pandemic prevention and control, overcoming the difficulties and ensuring the power supply. 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 the worst natural disasters over 20 years. In 2021, there was no severe safety injury, or accidents that occurred at the Company.

Jinling Power Plant Implement "Combo Punch" of the Safety Production Month

During 2021, Jinling Power Plant focused on the theme of "implementing safety responsibilities and promoting safe development", aiming to complete the 100-day safety power protection task for the 100th anniversary of the founding of the Communist Party of China with high quality and safety production throughout the year, focusing on doing a good job in safe production under the normalization of epidemic prevention and control, continued to carry out special rectification of electric power production safety, and make a solid "combination punch" for safety production month.



Jinling Power Plant

Strike a good "responsibility punch", strengthen double prevention. The Company practiced the new safety development concept, activated the safety supervision and prevention system, strengthened the control measures, and laid a solid foundation for the safety of the production site.

Strike a good "supervision punch", strengthen on-site control. The Company took the construction of dual prevention mechanism as the starting point to improve the level of risk control, extending from the traditional "behaviour supervision, operation supervision, on-site supervision" to "policy and regulation implementation supervision, system and regulation implementation supervision, management efficiency improvement supervision".



Employees of Jinling Power Plant Sign Their Names on A Safety Propaganda Banner

Strike a good "publicizing and implementation punch", strengthen the participation of all staff. Combined with on-site operation, safety training and team management, the Company accurately detected the weak links in safety management and carried out targeted "consultation and pulse detection" to improve the "safety quality" of all staff.

By popularizing safety knowledge, improving safety quality of all staff, enhancing risk prevention, cultivating safety culture, and implementing safety responsibility of all staff, Jinling Power Plant has carried out safety production monthly activities in an all-round way, and made efforts to promote safety management level to a new level.

Carrying out Comprehensive Safety Inspections to Eliminate Hazards in Time

1. Strengthen process tracking and make decisions in real time. We hold daily morning meetings concerning safety production to analyse problems, keep abreast of the safety production conditions of the grassroots units, release security instructions, and deploy related work in time. We established three WeChat Groups for flood prevention to release early warning timely and get unimpeded flood information. We also prepared daily reporting of dynamic flood information, providing information support for flood condition analysis and deployment decisions;

2. Enhance organisation management to ensure that responsibilities are individual-specific and the on-duty policy is strictly implemented. The leading groups at all levels take the lead in fighting the floods;

3. Strengthen the routine investigation and handling of potential hazards. We focus on the hazards identified to ensure thorough risk prevention and control with measures in place and hazards being properly managed;

4. Put emphasis on “personnel safety”. We inspect the slopes around the production and living areas, as well as the prevention and avoidance of debris flow, to ensure that production and living facilities avoid hazardous areas;

5. Strengthen emergency management, carry out emergency exercises, improve emergency plans and ensure adequate reserve for emergency materials;

6. Strengthen monitoring and early warning, take emergency response measures timely and scientifically. We cooperate with local governments by following the orders, actively participating in emergency rescue and rescuing personnel in time.



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 (《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 unannounced or uninformed inspections following the principle of "Site Visit subject to Four Noes" towards Huaneng Beijing Thermal Power Plant and other enterprises.

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

1. 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, 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.

2. 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.

3. 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.

4. The Company enhanced the safety management for natural gas pipelines and issued the Notice on Enhancing the Safety Management of Natural Gas Pipelines (《關於加强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.

Huangtai Power Plant Made Assiduous Efforts in Ensuring the Safety

Huangtai Power Plant was fully committed to safety production with a focus on power supply. With the advent of the summer, rainfall in the area where the Power Plant located gradually increased. Huangtai Power Plant attached great importance and took various measures to satisfy the peak power consumption in summer and prepared for flood prevention and control, ensuring power units' stable operations even in extreme weather. To cope with the peak consumption in summer, the Huangtai Power Plant planned, arranged and implemented earlier in conjunction with the characteristics of the summer flooding season and the problems identified in spring inspection, comprehensively investigating risk hazards from the safety responsibility, hazards inspection, economic operation, and equipment maintenance, rectifying the safety vulnerability, and formulating flood prevention plans. The Plant conducted flood prevention exercises and special potential hazards inspection, made technology breakthroughs, and strengthened technical supervision and operation management. The Plant counted emergency materials and ensured normal operations of equipment and devices by enhancing operators' abilities as well as waterproof and anti-thunder devices with overtemperature protection. On the occasion of the 20th national "Safety Production Month", Huangtai Power Plant held the launch ceremony for the 2021 "Safety Production Month" with the theme of "Implementing Safety Responsibilities and Promoting Safe Development". The Plant innovated work system and carried out a variety of activities including safety production publicity, education and training, investigation and rectification of potential hazards, and emergency exercises. The Plant also provided safety production trainings for outsourced teams, laying a solid foundation for the safe and stable operation of the power grid.



Strengthen Equipment Inspection



Operators Carefully Supervise and Inspect

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, strengthening the emergency management team and enhancing the staff's emergency response.

6.4 Caring and 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, the affiliated units of the Company formulated the Occupational Disease and Hazard Management Standards (《職業病危害管理規範》) and the Occupational Health Supervision and Management Standards (《職工健康監護管理規範》) 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 was in place. 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.

Beijing Thermal Power Plant Targeted the Critical Period of Epidemic Prevention and Control

Go where there is epidemic, fight it till it perishes. Beijing Thermal Power Plant has set up a prevention and control emergency command organization headed by the person in charge of the plant to take precautions, prevent and deal with large-scale infectious disease emergencies, avoid adverse effects on production safety due to the epidemic, so as to ensure the safe and stable operation of plant units. The Company has done a good job of factory security, strictly checking the incoming vehicles and personnel certificates, prevent irrelevant personnel from entering the factory and strictly screening the production related incoming vehicles to ensure that the order of the power plant is controllable. The Company comprehensively sorted out the statistics of all employees (including temporary employees) in and out of Beijing during the Spring Festival, and distributed masks, disinfectants and other epidemic prevention materials to employees. The Company has disinfected the office area and living area in time. The canteen, dormitory, office, production site and other areas in the factory were disinfected twice a day to ensure that there are no dead spots in the disinfection area. The Company actively carried out propaganda and psychological guidance on epidemic prevention and control to the power plant personnel, made use of the power plant's home page and wechat working group to timely release epidemic prevention and attention matters, called on the majority of Party members and cadres to fully carry forward the vanguard and exemplary role, guided all staff consciously to "do not believe rumors, do not spread rumors", and earnestly fulfilled the social responsibility.



Establishment ceremony of Anti-epidemic Production Readiness Team of Beijing Thermal Power Plant

6.5 Improving Employees' Safety Awareness

Raising employees' safety awareness is the 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 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, and 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 June and July 2021, the Company invited renowned national electrical safety experts to the Company's headquarters twice to conduct trainings on "prevention of personal death" in the "25 key requirements for preventing power production accidents". In August and September, workshops concerning production management, safety management, risk prevention and control as well as technical supervision were held, and the responsible persons in charge of production of each subsidiary unit participated in the training.

6.6 Tightening the Focus on Infrastructure Safety 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 (《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. The contractors are strictly examined for the qualifications, performance and bidding documents. 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. The contractor must obtain the construction unit's consent for subcontracting and the subcontractor must have corresponding qualifications and safety production license. 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, establish a safety training system, specify the safety production training department and its principal, formulate an education and training plan for safety production, establish employee safety training filing records, regularly identify safety education and training needs and assess the effectiveness of training to continuously improve employees' awareness of safety and self-protection.

Deepen the Implementation of the Responsibility Subject

The Company has established a sound safety production responsibility system, specified the responsible personnel, scope of responsibility and assessment standards for each safety production position, as well as safety management responsibilities for construction at all levels, and strengthened safety supervision and management, ensuring the effective operation of the safety supervision and assurance system.

Enhance On-site Safety Control

The Company vigorously improves safety through technology, develops and promotes the function of smart infrastructure security module to assist on-site safety control, implements closed management of construction sites by strict access control, tightens management and control of employees' conducts and working process, and reduces habitual violations. 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 as well as the acceptance of the potential hazards mitigation for closed-loop management of preventing potential risk and improving the infrastructure safety.

ENHANCING THE TALENTED TEAM BUILDING





07

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.

Enhancing the Talented Team Building

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 the Company is exposed to a lower risk of employing child labour and forced labour, there is no need to establish remedial measures for the violation identified.

As of the end of 2021, the Company had a total of 57,513 employees, of whom 81% had received college qualifications or above. In 2021, 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 2021, the Company did not have any social insurance violations or defaults.

Compensation System: 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, and is paid on time and in full amount.

Right for Leave and Vacation: The Company and its subsidiaries have established sound leave systems in accordance with the state policy and local policy. 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 2021, the Company successfully held the 2021 annual employee representatives' conference. The Company's proposals were solicited from the employee representatives with a response and handling rate of 100%, and the Company adjusted the representative supervisor of the 10th Board of Supervisors, fully activating employees' proactiveness and enthusiasm in participating in the Company's management. The Company deepens transparent business and democratic management to enhance the scientific democratic management, formulates measures for the transparent business list system and timely adjusts the corresponding leading team of the Company, thus protecting employees' rights to know, participate, express and supervise and promoting joint development of the Company and its employees.

7.2 Promoting Employee 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, and activate talent innovation by seizing 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 nine group-level training bases (training classrooms). 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 2021 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 2021, 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 3 employees were awarded the "Great National Craftsmen" title, 4 were awarded the "National Technical Expert" title, 4 were awarded the "Power Industry Craftsmen" title, 2 were awarded the "Power Industry Outstanding Operator" title, 9 were awarded the "Huaneng Craftsmen" title, and 28 were awarded the "Huaneng Group Technical Expert" title. The Company also organised occupational skill appraisals where hundreds of employees received technician certification and thousands of employees 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.

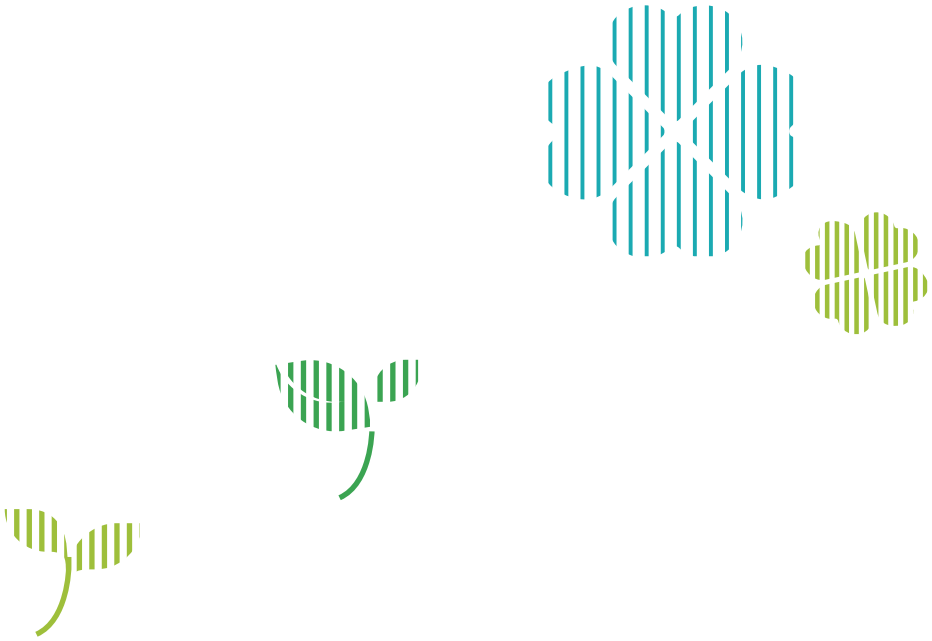
The Company makes more efforts to refine its talent system and mechanism and optimise the recruitment procedure and evaluation mechanism for professional and technical positions. The Company promotes employees with outstanding skill sets and performance or those whom their peers well recognise. Through 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 cadres. 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 cadres with the right political ideology, strong sense of duty and great performance. We train the leaders in practice through job rotation and promoting communication, thereby facilitating talent flow and optimising human resource structure. In addition, we continuously improve management's performance to manage complex situations and build a talent team of high-quality and professional cadres, which meets the standards of qualified management in the new era who are loyal, honest and responsible.

The Company continuously strengthens talent development, deepens the cultivation of international talents, actively and steadily carries out training work, proactively carries out title management and talent evaluation work, and optimises employee recruitment to improve core management and professional teams' comprehensive skills and management capability.

In 2021, the Company further strengthened the selection and training of young cadres, continuously improving the age structure and stimulating young employees' working enthusiasm. The Company formulated development plans for young talents and enhanced talent training with the consideration of Youth League Committee's work, providing a platform for outstanding youth to practise and strengthen their ability, so as to help the Company develop versatile talents.

In the future, the Company will deepen the reform of labour, personnel and distribution system, 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 Occupational 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 enable staff and enterprises to grow together, sharing the fruits of reform and development, which fills employees' work and life with happiness.

In 2021, the Company organised employees to participate in various essay solicitation, art exhibition solicitation, calligraphy, painting and photography collection activities with the theme of celebrating the 100th anniversary of the founding of the Communist Party of China, and diversified and colourful online and offline cultural and sports activities such as walking, friendship activitied for young employees for 47 times. At the time of Women's Day, the Company actively organised female employees to participate in the knowledge contest about the Party history and "Shu Xiang Women's Day" reading activity. 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.



Online Psychological Counselling for Overseas Employees

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 and provides comprehensive physical examination and cancer prevention screening for employees every year. Besides, the Company attaches great importance to the prevention and control work of COVID-19 and actively provide health services for employees, especially pays great attention to the physical health of overseas employees, sends letters for consolation in time, and makes plans for the stabilisation of Chinese employees working abroad. We also organise personnel stationed in Singapore to actively participate in online psychological counselling and "A Letter From Home" activity.

08

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.



MAKING CONCERTED EFFORTS TO SEEK COMMON DEVELOPMENT



Making Concerted Efforts to Seek Common Development

8.1 Deepening Supply Cooperation

Building trusted and cooperative relationships with suppliers are crucial to realizing 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.

Based on the supply category, the Company divides our suppliers into three categories: materials, service and engineering. The Company's supplier management emphasises the importance of Classified management, rigorous acceptance control, quantitative assessment and dynamic maintenance".

Supplier Development

The Company's business units at all levels conduct supplier stocktakes and analysis each year to try to identify more high-quality suppliers. Meanwhile, 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.

Supplier Acceptance

The Company's business units at all levels 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, 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

In response to the quality problems occurring in the provision of procurement services by suppliers as well as the problems in suppliers' integrity, delivery, and service during the course of their participation in warehousing applications, procurement activities, and contract performance, the Company will, depending on the severity of the problems, take punitive measures such as downgrading, suspension of the award of contracts, and suspension of cooperation within a limited time.

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 specifies the classifications of suppliers and their corresponding management measures and regulates 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.

In 2021, Huaneng International implemented 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, seeks resources of "dead end", 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. 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. There is also a specific set of requirements formulated by the Country for the recruitment of miners in large coal mines. 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》) promulgated by the state, the Company 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-sulphur and low-ash, which has made outstanding contributions to the national targets of achieving the annual target of controlling energy consumption and carbon emissions and promoting energy saving and emission reduction.

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 formulated Heat Supply Management Measures (《供熱管理辦法》), Marketing Management Regulations (《市場營銷管理規定》), Electricity Market Trading Management Measures (《電力市場交易工作管理辦法》) and other marketing-related systems to regulate customer service processes. In 2021, the scale of electricity transactions in the provincial and municipal electricity markets accelerated. The Company made use of various channels through electricity sales companies to strengthen the development of power users, with a variety of customer types, a relatively stable number and electricity consumption of large users signed for the whole year, and a rapid increase in the number and electricity consumption of small and medium-sized users. Adhering to the customer-oriented service concept, the Company established a customer service mechanism, and conducted promotion meetings, regular communication via telephone and regular return visits to understand customer needs and solve their problems about electricity. The Company also actively developed value-added services for customers, providing information consultation, quotation agency, electricity consumption monitoring, energy consumption diagnosis, energy saving transformation, operation and maintenance, financial service, etc., so as to continuously improve customer satisfaction and maintain harmonious customer relationships. When receiving customer complaints, the Company immediately transfers the complaints to regional branches and grassroots units, and supervises them to handle the complaints in accordance with the management regulations and procedures.

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

1. Continuously improve the level of professional technology and electricity sales services, fully consider the differentiated needs of users, and provide users with accurate and high-quality services.
2. Establish the service concept and a customer service system, which reflects the warmth of our service and technical professionalism, thus drawing customer relationships closer and improving adhesiveness of users.
3. Encourage the development of chargeable value-added services for individual needs, promote the rapid development of value-added services, and actively explore business models that combine carbon trading with electricity trading.

8.3 Fulfilling Social Responsibilities

Huaneng International has always adhered to the harmonious development concept of "serving the nation, benefiting the society, seeking multiple wins and growing together", by actively responding to the call of the state, providing supports and assistance, earnestly fulfilling our social responsibilities and giving an impetus to build a harmonious and win-win society. Major energy media such as "Learning Power" APP, China Electric Power News, China Electric Power Magazine (《中國電業》) and the official WeChat of China Electric Power News reported on the Company's 2020 Sustainability Report (《2020年度可持續發展報告》) upon its release in August 2021, which received widespread praise in the industry and enhanced the Company's brand influence and reputation.

According to the requirements of the SASAC on facilitating the rural revitalisation by central enterprises and the Group's work plan for poverty alleviation through consumption in 2021, we consolidated and expanded the achievements of poverty alleviation to facilitate the rural revitalisation, thus ensuring the constant efforts at paired assistance and poverty alleviation through consumption. By conducting the practice of "bring tangible benefits to the masses", we invited experts from academy of traditional Chinese medicine to the Company to carry out health diagnosis and treatment activities of "treating before disease attack" for employees, so as to better play the important role of the labour union in making concerted efforts to move forward.

Assisting in Rural Revitalisation

In 2021, the Company carefully summarised its experience in poverty alleviation, focused on the rural revitalisation strategy, and carried out targeted assistance initiatives to successively provide assistance in industry, consumption, education and infrastructure. Combining the characteristics of resources in the poverty-stricken areas, the Company gave full play to the advantages of its main business, and invested in the construction of photovoltaic assistance projects such as centralised photovoltaic agriculture and photovoltaic fishery to help solve local electricity shortages and stimulate local economic growth.

In terms of supporting the construction of infrastructure in areas that have been lifted out of poverty, the Company has invested more than 10 million RMB to improve the education, medical care and living conditions for those in difficulties, and promote sustainable rural development. With respect to consumption poverty alleviation, the Company organized online and offline multi-channel procurement of products, and adopted new forms such as live broadcasts with goods, and carried out assistance and sales activities. The accumulated purchase of agricultural products in poverty alleviation areas throughout the year exceeded 50 million RMB. Tuas Power of Singapore earnestly fulfilled its social responsibilities and provided anti-pandemic assistance to the Indian Red Cross Society through the Singapore Red Cross.

Chongqing Branch Contributed to Rural Revitalisation with Heart and Soul

Chongqing Branch contributed to rural revitalisation with heart and soul in the following five major aspects. In terms of talent support, Chongqing Branch selected and appointed the chief secretary stationed in Zhongba Village, Zhongxian County, Chongqing, whose work was well received by local villagers so far. In terms of education poverty alleviation, the Executive Director and the secretary of the Party Committee of the Branch went into the classrooms of Xinsheng Secondary School to tell historical stories of the Party to students, motivating them to change their fate with knowledge. They also presented books to the school and sponsored three students to attend school, thus contributing to the development of education. In terms of project poverty alleviation, Chongqing Branch contributed RMB400,000 to renovate the Party and Community Service Centre in the village and develop the village e-commerce platform. Through the "agricultural and sideline products + Internet + logistics", the villagers could sell agricultural and sideline products without leaving home, which helped them make money and increase income. In terms of poverty alleviation with care, representatives of the Branch paid several visits to old party members and villagers in Zhongba Village, and brought them daily necessities such as rice, oil and milk, making them feel "warm and love". Meanwhile, taking advantage of Huaneng's professional, the League members of the Branch were organised to maintain power lines to ensure the safety of power consumption for villagers in Zhongba Village. In terms of consumption poverty alleviation, the procurement of agricultural and sideline products from Zhongxian County in Chongqing, Yulin City in Shaanxi and Cangxi County in Sichuan amounted to nearly RMB2 million, which drove the enthusiasm of local villagers to make money, increase income and develop the industry.



Chongqing Branch donated books to Zhongxian Xinsheng Middle School



Volunteers Activity of Chongqing Branch

Guizhou Branch – "Caring for Poor Students and Helping Them Grow into a Useful Person"

In active response to the call of the local government, the Guizhou Branch continued to implement the voluntary assistance action of "Caring for Poor Students and Helping Them Grow into a Useful Person", and carried out various public welfare activities such as donating money to assist students and sending warmth and love to poor students in Guizhou, which were highly praised by the local government and education department. From August to September 2021, a large number of League members of Guizhou Branch visited village households in Jindou Town, Weining County and Gangwu Town, Guanling County to carry out the activity of "Poverty Alleviation Through Increasing People's Confidence and Helping Them Acquire Knowledge and Skills". They also built a platform to offer help and support about growth and development, provided advices on college entrance examination application for 18 freshmen-to-be, and granted subsidies totalling RMB24,000, which convincingly improved the effectiveness of poverty alleviation through education and showed the responsibility of the Company in rural revitalisation.



Volunteers Activity of Guizhou Branch

Hubei Branch Contributed to Rural Revitalisation through Creating New Projects

According to the work deployment in rural revitalisation made by the CPC Hubei Provincial Committee and the People's Government of Hubei Province, Hubei Branch provided paired assistance to Gaojiagou Village, Sanguandian Street, Danjiangkou City. The Branch and the working team stationed in the village actively communicated with the local government, conducted in-depth research and visits, and agreed to help Gaojiagou Village develop the project of integrated agriculture and tourism demonstration park – Gaojiagou, Land of Idyllic Beauty, with investments and donations of RMB1.8 million. This project is adjacent to the Danjiangkou Reservoir and with a magnificent and beautiful natural landscape, Hubei Branch aimed to create a rural revitalisation industry project integrating leisure and vacation, cultural tourism, and health wellness. After completion, the project would effectively increase the collective income of the village, drive the development of local industries, and achieve the effective connection between the consolidation and expansion of poverty alleviation achievements and rural revitalisation.



Gaojiagou, Land of Idyllic Beauty

Shanxi Branch Helped the Younger Generation of Baiguansi Village through Education

Shanxi Branch's working team stationed in the village deeply realised that the rejuvenation of the country depends on the young generation, and education is the key to the rejuvenation. In 2021, the working team stationed in villages adhered to "increasing people's confidence" and "helping them acquire knowledge and skills", made great efforts for poverty alleviation through education in Baiguansi Village, and carried out a series of publicity and education to inspire and nurture villagers with advanced culture. The work team actively communicated and coordinated with village officials, took the initiative to visit students' families and help eligible students register for the "Dewdrop Project", fill in their personal information and deal with the formalities. In 2021, a total of 8 rural students were funded by education alleviation.



Registration for the "Dewdrop Project"- Shanxi Branch

Anhui Branch Boosted Rural Revitalisation Through Industrial Revitalisation

Huangchong Village in Anhui Province, a village enjoying paired assistance from Anhui Branch, suffered from a flood in 2020. Anhui Branch made an in-depth analysis of the flood and its causes, took the initiative to help Huangchong Village in post-disaster reconstruction, specially assisted the implementation of land governance projects, levelled and upgraded the affected farmland, and built 440 mu of high-standard demonstration farmland. In 2021, thanks to the good drainage and flood control ability of the demonstration farmland, the demonstration farmland had a bumper harvest, with a yield of more than 750 kilograms of rice per mu and an increased production and income of more than RMB800,000, despite the widespread damage in the surrounding areas. The project solved the problem that the output of the waterlogged land in the east and west village has been reduced or even lost due to the floods this year, and effectively enhanced the "hematopoietic" ability, which was warmly praised by the masses.



Huangchong Village has a Bumper Harvest

BUILDING AN INTERNATIONAL BUSINESS PLATFORM





09

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.

Building An International Business Platform

About Tuas Power

Tuas Power owns Tuas Power Station and Tembusu Multi-Utilities Complex (TMUC). In 2021, the cumulative electricity market share of Tuas Power was 19.2%.

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, seawater desalination 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 provide a variety of pressure grades of steam to meet the differentiated needs of different customers while generating electricity. This process is achieved through steam turbine generator sets. This cogeneration process helps to further improve the efficiency of the Tembusu thermal power plant.

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 meet international standards and have obtained ISO 14001 (Environmental Management System) certification.

In 2021, Tuas Power had no reportable environment-related incidents. In the future, 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.

In 2021, mitigation of steam loss was initiated at TMUC. This was done by installing Hi-stop (live seal) adaptors at identified passing header drains to arrest steam losses from steam traps and valves, without the need to shutdown LP header. 3 of these live seals were installed in September 2021.

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

In November 2021, TMUC renewed its ISO 50001 energy management system certification, which fully reflected 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, 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 addition, mitigation measures that reduce energy losses from power plants or increase the power generation efficiency of power plants can also help reduce greenhouse gas emissions.

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 have submitted their annual emissions reports based on these approved documents and paid the relevant carbon taxes accordingly.

Other Emission Management

In 2021, 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 sulphur dioxide. TMUC reduces NOx and SO_2 emissions by using advanced Circulating Fluidized Bed (CFB) boilers, and purchasing of low-sulphur low-ash coal. The low furnace temperature of CFB boilers and the use of low-sulphur low-ash coal have ensured a low NOx and low SO_2 emission. Utilisation of high efficiency bag filters 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".

Ash Recycling and Utilisation

In Singapore, the landfill of the ashes 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 tons/month to 100 tons/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 the well-designed water cycle, 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) since 2019.

Green Programme

Tuas Power has embarked on various initiatives in support of carbon emission reduction to address the challenges posed by climate change and meet carbon reduction goals. Our initiatives include exploring and participating in importing renewable energy and providing carbon-reduction solutions for customers, such as charging of electric vehicles, solar energy generation, energy efficiency improvements and Renewable Energy Certificates (RECs). In the future, Tuas Power is also exploring future solutions such as hydrogen power generation.

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 system has also improved the efficiency and accuracy of billing to tenants. To date, Tuas Power has provided this service for more than 200 buildings and installed more than 8,000 electricity meters and related infrastructure.

Customer Information Protection

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

Community Building

Tuas Power is closely linked to the community and provides Statutory Boards of the Singapore Government, charity organisations and non-profit organisations with public service, financial assistance and cooperation, including Gardens by the Bay, Singapore Children's Association, Metta Preschool, Focus on the Family and other public institutions. Tuas Power also cooperates with governmental agencies like the Ministry of Education, Singapore (MOE) and the Singapore Energy Market Authority (EMA) to provide funds for students of 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 are frequent interactions and mutual assistance between Tuas Power and the Company.

Staff from Tuas Power and Huaneng regularly consult and discuss technical, production and engineering matters through online methods such as virtual meetings to further improve and strengthen operational efficiency of the Tuas Power Station and TMUC. On 30 November 2021, the Chief Operating Officer of Tuas Power gave an online speech, sharing and exchanging the challenges and experiences that Tuas Power faced in dealing with electricity retail in a fully competitive market environment. The mutual exchange promotes best practices and innovation.

The Company dispatched several technical experts to Tuas Power and TMUC. These technical experts, while working in Singapore, provided local power plants with advanced management experience and professional technical support of domestic power plants, and also benefited from cross-cultural work practices. In view of this, Tuas Power has achieved cultural integration, management synergy and operational improvement at home and abroad.

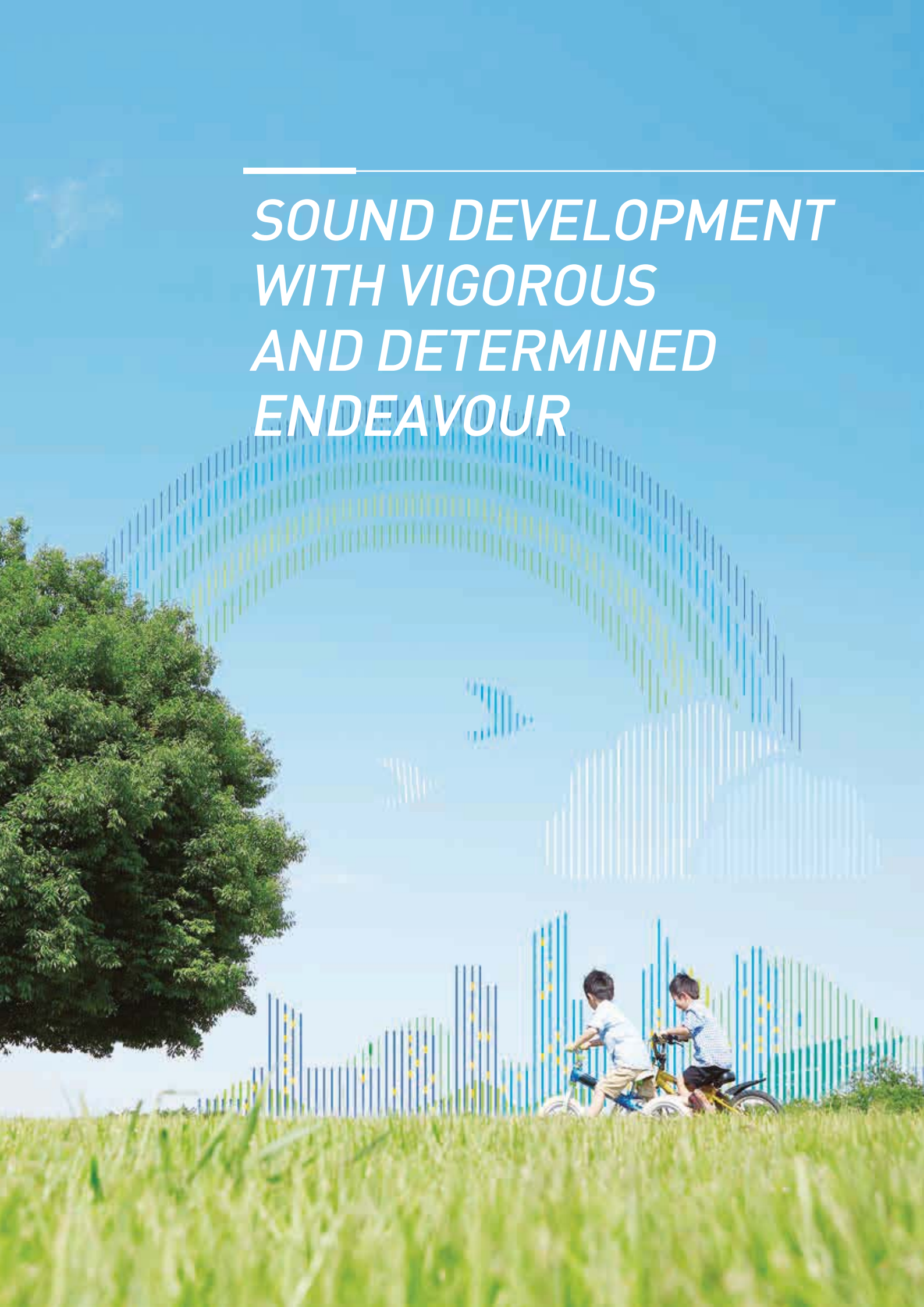


10

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, has implemented the Company's development strategy whilst adhering to steady progress, promoting transformation and upgrading, and actively carrying out reforms and innovations.



SOUND DEVELOPMENT WITH VIGOROUS AND DETERMINED ENDEAVOUR



Sound Development with Vigorous and Determined Endeavour

By 2025, Huaneng International will basically build an electricity-centred and innovation-oriented modern energy industry system with multi-energy synergy and global layout. With all major indicators reaching the advanced level of peer energy enterprises worldwide, Huaneng International will be enlisted as one of the worldclass listed power generation companies.

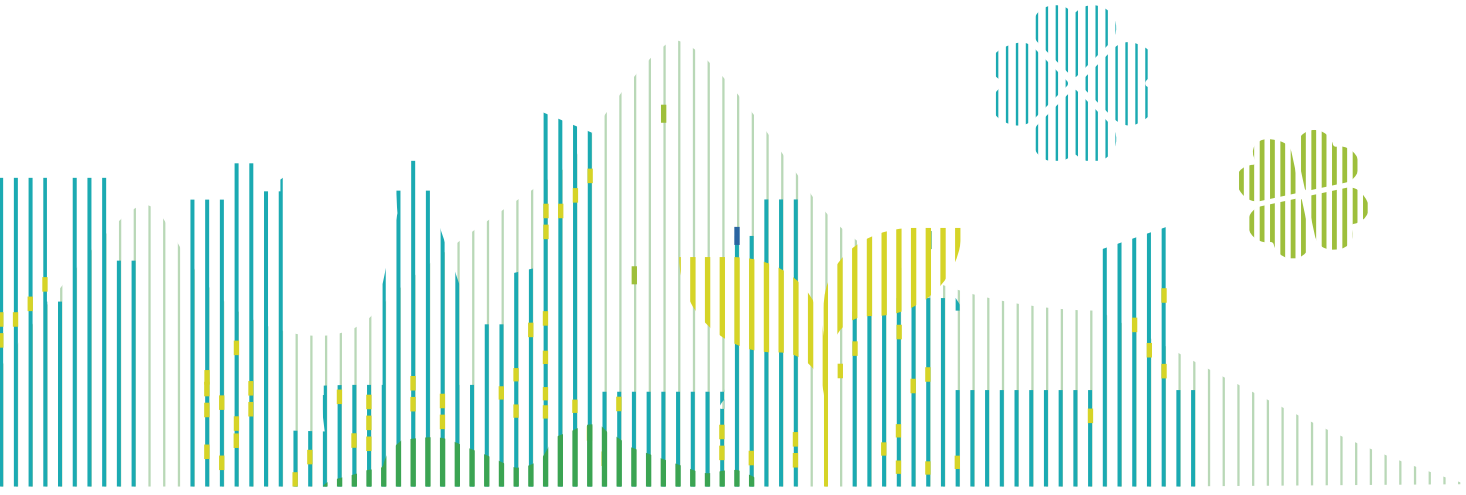
To promote green, low-carbon and circular development, we will promote the development of an integration of sources, networks, loads and storage and the multi-energy complementary smart energy system. Sticking to the objectives of "carbon peak" and "carbon neutrality", we promote green and low-carbon energy transformation, and adhere to the principle of "national overall planning, priority to conservation, dual-wheel drive, smooth cost alleviation mechanism, and prevention of risks". During the "14th Five-Year Plan" period, we will effectively reduce carbon emissions, strive to achieve carbon peaks, and lay a solid foundation for carbon neutrality. On the one hand, we adopt renewable energy alternatives and vigorously develop the new energy business to build a new power system with large-scale wind power base as the basis and the surrounding clean, efficient, advanced and energy-saving coal power plants as support. On the other hand, we transform the development of coal power, prioritise gas and other clean energy power generation, actively deploy pumped storage power generation to achieve an integration of sources, networks, loads and storage and the multi-energy complementary development. By 2025, the Company's installed capacity of low-carbon clean energy will account for about 45%.

We will strengthen and improve the comprehensive energy services, actively adapt to the transformation of China's energy supply structure, and continue to develop the strategy-focused emerging industries through digitalization. To carry out diversified supply and energy service transformation centred on core industries, we actively develop energy storage, and participate in the demonstration of integrated green hydrogen industry of "production, storage, transportation and utilization"

Adhere to the new "dual circulation" development pattern, and the principle of "clean, benefit, steady", the Company will strengthen the international cooperation, relying on Tuas Power, to build the Company's overseas innovation and development platform. We will strengthen the efficient operation of overseas assets, optimize the asset portfolio, and improve the risk resistance and profitability of overseas assets.

To take the lead of scientific and technological innovation, support the high quality development of the Company, we will promote the high quality science and technology innovation development, adhere to the strategy of serving the country, adapt to the need of the Company development, adhere to the digital intelligent development, further enhance the independent innovation ability and the implementation of demonstrative project of science and technology, and strengthen the basic and forward-looking technology research.

The Company adheres to the orientation of promoting profitability, improving efficiency and creating value, works hard to ensure the safety of production, conserve energy and improve efficiency, and protect the ecological environment. We will strengthen and optimize major industries and improve industrial coordination. Focusing on the "two benefits and four rates"[14], the Company strives to improve quality and efficiency as well as deal with difficulties. The Company's operational vitality is enhanced, and its operational efficiency and other indicators reach the international advanced level.



[14] "two benefits and four rates": net profit and total profit, operating income profit ratio, asset-liability ratio, R&D investment intensity and labour productivity of all employees.

11 Appendix

11.1 About this Report

This report is the sixth "Environmental, Social and Governance Report" (《環境、社會及管治報告》) 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.

No major adjustments have been made to the disclosure scope hereof compared with that of the Company's previous ESG reports, and the statistical approaches adopted remains consistent.

Reporting Period

The Company's "Environmental, Social and Governance Report" (《環境、社會及管治報告》) is an annual report for the period from 1 January 2021 to 31 December 2021, 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" and "Group Company".

Content Compiling

The contents of this report are prepared in the light of the HKEx's "Environmental, Social and Governance Reporting Guide" (《環境、社會及管治報告指引》), and the Global Reporting Initiative (GRI) Sustainability Reporting Standards (GRI Standards) (《可持續發展報告標準》). 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 Statement of the Board of Directors

The Board of Directors assumes the overall responsibility for the Company's ESG management and disclosure, and holds annual board meetings to discuss important ESG-related issues.

The strategy committee is in charge of supervising the Company's comprehensive risk management. The Company has incorporated safe production, environmental protection and other ESG material topics into the comprehensive risk management assessment process. The strategy committee meets regularly every year to discuss assessment over the comprehensive risk management. At the 2021, the strategy committee deliberated on and approved the 2021 Comprehensive Risk Management Report (《公司2021年度全面風險管理報告》), which comprehensively summarised safe production, environmental protection and other ESG-related risks, and formulated detailed responses, with changes in material risks closely tracked and monitored.

At the 2021 annual board meeting, the Board mainly reviewed the assessment of ESG material topics and establishment of environmental targets. The Company identified 18 ESG reporting topics, including 6 material topics, i.e., Control of Emissions, Law-Abiding and Compliance, Use of Energy, Ecological Protection, Anti-Corruption, Safe Production and Occupational Health. As compared with 2020 report, "Response to Climate Change" topic is newly added to this report. The Company sets five environmental performance targets in emission reduction, carbon reduction, waste reduction, energy saving and water conservation, covering Emissions Management, Energy Consumption Management, and Water Resources Management.

2021 ESG Report provides detailed disclosure of the progress and key performance indicators in relation to the above work and ESG topics. The report was reviewed and approved by the Board of Directors in March 2022.



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

Environmental, Social and Governance Reporting Guide	Page Number	Report Content
Statement of the Board of Directors		
• A disclosure of the Board's oversight of ESG issues • A disclosure of the Board's ESG management approach and strategy, including the process used to evaluate, prioritise and manage material ESG-related issues (including risks to the issuer's businesses) • A disclosure that how the board reviews progress made against ESG-related goals and targets with an explanation of how they relate to the issuer's businesses.	92	11.2 Statement of the Board of Directors
Reporting Principles		
Materiality: (i) the process to identify and the criteria for the selection of material ESG factors; (ii) if a stakeholder engagement is conducted, a description of significant stakeholders identified, and the process and results of the issuer's stakeholder engagement.	15-19	2.7 Communication with Stakeholders and Identification of Material Issues
Quantitative: Information on the standards, methodologies, assumptions and/or calculation tools used, and source of conversion factors used, for the reporting of emissions/energy consumption (where applicable) should be disclosed.	11-14 91	2.6 Table of Key Performance Indicators in 2021 11.1 About this Report
Consistency: The issuer should disclose in the ESG report any changes to the methods or KPIs used, or any other relevant factors affecting a meaningful comparison	91	11.1 About this Report
Reporting Scope		
A narrative explaining the reporting scope of the ESG report and describing the process used to identify which entities or operations are included in the ESG report. If there is a change in the scope, the issuer should explain the difference and reason for the change.	91	11.1 About this Report

Environmental, Social and Governance Reporting Guide		Page Number	Report Content
Subject Area A: Environment			
Aspect A1: Emissions			
A1	General Disclosure	44-52	5.3.4 Emissions Management
A1.1	The type of emissions and respective emission data	44-52	5.3.4 Emissions Management
A1.2	Direct (Scope 1) and energy indirect (Scope 2) greenhouse gas emissions (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	44-52	5.3.4 Emissions Management
A1.3	Total hazardous waste produced (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	44-52	5.3.4 Emissions Management
A1.4	Total non-hazardous waste produced (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	44-52	5.3.4 Emissions Management
A1.5	Description of emission target(s) set and steps taken to achieve them.	44-52 82-87	5.3.4 Emissions Management 9 Building An International Business Platform
A1.6	Description of how hazardous and non-hazardous wastes are handled, and a description of reduction target(s) set and steps taken to achieve them.	44-52 82-87	5.3.4 Emissions Management 9 Building An International Business Platform
Aspect A2: Use of Resources			
A2	General Disclosure	40-43 43-44	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).	40-43	5.3.2 Energy Consumption Management
A2.2	Water consumption in total and intensity (e.g. per unit of production volume, per facility).	43-44	5.3.3 Water Resources Management
A2.3	Description of energy use efficiency target(s) set and steps taken to achieve them.	40-43 82-87	5.3.2 Energy Consumption Management 9 Building An International Business Platform
A2.4	Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency target(s) set and steps taken to achieve them.	43-44	5.3.3 Water Resources Management
A2.5	Total packaging material used for finished products (in tons) and, if applicable, with reference to per unit produced.	–	Not applicable due to product nature

Environmental, Social and Governance Reporting Guide		Page Number	Report Content
Aspect A3: The Environment and Natural Resources			
A3	General Disclosure	36-53	5 Transformation 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.	36-53	5 Transformation Development Driven by Innovation
Aspect A4: Climate Change			
A4	General Disclosure	47-49	5.3.4.2 Management of Greenhouse Gases
A4.1	Description of the significant climate-related issues which have impacted, and those which may impact, the issuer, and the actions taken to manage them.	47-49	5.3.4.2 Management of Greenhouse Gases
Subject Area B: Social			
Employment and Labour Practices			
Aspect B1: Employment			
B1	General Disclosure	68-69	7.1 Protecting Employees' Rights and Interests
B1.1	Total workforce by gender, employment type (for example, full- or part-time), age group and geographical region.	11-14	2.6 Table of Key Performance Indicators in 2021
B1.2	Employee turnover rate by gender, age group and geographical region.	11-14	2.6 Table of Key Performance Indicators in 2021
Aspect B2: Health and Safety			
B2	General Disclosure	56-65	6 Solidifying the Bottom Line for Safe Production
B2.1	Number and rate of work-related fatalities occurred in each of the past three years including the reporting year.	11-14	2.6 Table of Key Performance Indicators in 2021
B2.2	Lost days due to work injury	11-14	2.6 Table of Key Performance Indicators in 2021
B2.3	Description of occupational health and safety measures adopted and how they are implemented and monitored.	60-63 63-64 71	6.3 Adopting Vigorous Safety Measures 6.4 Caring and Safeguarding Occupational Health 7.3 Caring Occupational Health

Environmental, Social and Governance Reporting Guide		Page Number	Report Content
Aspect B3: Development and Training			
B3	General Disclosure	64 69-70	6.5 Improving Employees' Safety Awareness 7.2 Promoting Employee Development
B3.1	The percentage of employees trained by gender and employee category (e.g. senior management, middle management).	11-14	2.6 Table of Key Performance Indicators in 2021
B3.2	The average training hours completed per employee by gender and employee category.	11-14	2.6 Table of Key Performance Indicators in 2021
Aspect B4: Labour Standards			
B4	General Disclosure	68-69	7.1 Protecting Employees' Rights and Interests
B4.1	Description of measures to review employment practices to avoid child and forced labour.	68-69	7.1 Protecting Employees' Rights and Interests
B4.2	Description of steps taken to eliminate such practices when discovered.	68-69	7.1 Protecting Employees' Rights and Interests
Operating Practices			
Aspect B5: Supply Chain Management			
B5	General Disclosure	74-75	8.1 Deepening Supply Cooperation
B5.1	Number of suppliers by geographical region	11-14	2.6 Table of Key Performance Indicators in 2021
B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, and how they are implemented and monitored.	74-75	8.1 Deepening Supply Cooperation
B5.3	Description of practices used to identify environmental and social risks along the supply chain, and how they are implemented and monitored.	74-75	8.1 Deepening Supply Cooperation
B5.4	Description of practices used to promote environmentally preferable products and services when selecting suppliers, and how they are implemented and monitored.	74-75	8.1 Deepening Supply Cooperation

Environmental, Social and Governance Reporting Guide		Page Number	Report Content
Aspect B6: Product Responsibility			
B6	General Disclosure	26-28	4.1 Improving Capabilities of Guaranteeing Energy Supply
B6.1	Percentage of total products sold or shipped subject to recalls for safety and health reasons.	–	Not applicable due to product nature
B6.2	Number of products and service related complaints received and how they are dealt with.	76	8.2 Providing Quality Service
B6.3	Description of practices relating to observing and protecting intellectual property rights.	33	4.2.3 Protection of Intellectual Property Rights
B6.4	Description of quality assurance process and recall procedures.	–	Not applicable due to product nature
B6.5	Description of consumer data protection and privacy policies, and how they are implemented and monitored.	–	Not applicable due to business nature
Aspect B7: Anti-corruption			
B7	General Disclosure	30-32	4.2.2 Anti-corruption
B7.1	Number of concluded legal cases regarding corrupt practices brought against the issuer or its employees during the reporting period and the outcomes of the cases.	30-32	4.2.2 Anti-corruption
B7.2	Description of preventive measures and whistle-blowing procedures, and how they are implemented and monitored.	30-32	4.2.2 Anti-corruption
B7.3	Description of anti-corruption training provided to directors and staff.	8-10 30-32	2.5 ESG Responsibility Management 4.2.2 Anti-corruption
Community			
Aspect B8: Community Investment			
B8	General Disclosure	76-79 82-87	8.3 Fulfilling Social Responsibilities 9 Building An International Business Platform
B8.1	Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport).	76-79 82-87	8.3 Fulfilling Social Responsibilities 9 Building An International Business Platform
B8.2	Resources contributed (e.g. money or time) to the focus area.	76-79	8.3 Fulfilling Social Responsibilities

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

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
GRI 101: Foundation 2016			
GRI 102: General Disclosures 2016			
102-1	Name of the organisation	6-7	2.1 Company Profile
102-2	Activities, brands, products, and services	6-7	2.1 Company Profile
102-3	Location of headquarters	106	11.5 Readers' Feedback
102-4	Location of operations	6-7	2.1 Company Profile
102-5	Ownership and legal form	6-7	2.1 Company Profile
102-6	Markets served	6-7	2.1 Company Profile
102-7	Scale of the organisation	6-7 11-14	2.1 Company Profile 2.6 Table of Key Performance Indicators in 2021
102-8	Information on employees and other workers	68-69	7.1 Protecting Employees' Rights and Interests
102-9	Supply chain	74-75	8.1 Deepening Supply Cooperation
102-10	Significant changes to the organisation and its supply chain	91	11.1 About this Report
102-11	Precautionary principle or approach	7 8-10	2.2 Corporate Governance 2.5 ESG Responsibility Management
102-12	External initiatives	8-10	2.5 ESG Responsibility Management
102-13	Membership of associations	15	2.7.1 Information about and Communication with Stakeholder
102-14	Statement from senior decision-maker	2-3	1 Chairman's Statement

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
102-16	Values, principles, standards, and norms of behaviour	7-8 8	2.3 Development Strategy 2.4 Company Philosophy
102-18	Governance structure	7	2.2 Corporate Governance
102-40	List of stakeholder groups	15	2.7.1 Information about and Communication with Stakeholder
102-41	Collective bargaining agreements	68-69	7.1 Protecting Employees' Rights and Interests
102-42	Identifying and selecting stakeholders	15	2.7.1 Information about and Communication with Stakeholder
102-43	Approach to stakeholder engagement	15	2.7.1 Information about and Communication with Stakeholder
102-44	Key topics and concerns raised	15	2.7.1 Information about and Communication with Stakeholder
102-45	Entities included in the consolidated financial statements	91	11.1 About this Report
102-46	Defining report content and topic boundaries	91	11.1 About this Report
102-47	List of material topics	16-17	2.7.2 Process of Identification of Material Issues
102-48	Restatements of information	–	No previous reports have been rewritten
102-49	Changes in reporting	–	No major changes
102-50	Reporting period	91	11.1 About this Report
102-51	Date of most recent report	91	11.1 About this Report
102-52	Reporting cycle	91	11.1 About this Report
102-53	Contact point for questions regarding the report	91	11.1 About this Report
102-54	Claims of reporting in accordance with the GRI Standards	–	Core suitable plan
102-55	GRI content index	98-105	11.4 Contents Index of GRI Sustainability Reporting Standards (GRI Standards) of Global Reporting Initiative
102-56	External assurance	–	No external review temporarily

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
EU1	Install capacity by primary energy and regulatory mechanism	6-7 11-14	2.1 Company Profile 2.6 Table of Key Performance Indicators in 2021
GRI 200 Economic			
Economic Performance			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	6-19	2 About Us
103-2	The management approach and its component	6-19	2 About Us
103-3	Evaluation of the management approach	6-19	2 About Us
GRI 201: Economic Performance 2016			
201-1	Direct economic value generated and distributed	11-14 76-79	2.6 Table of Key Performance Indicators in 2021 8.3 Fulfilling Social Responsibilities
Anti-Corruption (Material Issue: Management by Law and Anti-Corruption)			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	16-17 30-32	2.7.2 Process of Identification of Material Issues 4.2.2 Anti-corruption
103-2	The management approach and its component	30-32	4.2.2 Anti-corruption
103-3	Evaluation of the management approach	30-32	4.2.2 Anti-corruption
GRI 205: Anti-Corruption 2016			
205-1	Operations assessed for risks related to corruption	30-32	4.2.2 Anti-corruption
205-2	Communication and training about anti-corruption policies and procedures	30-32	4.2.2 Anti-corruption
205-3	Confirmed incidents of corruption and actions taken	30-32	4.2.2 Anti-corruption

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
GRI 300 Environmental			
Energy (Material Issues: Energy Use, Clean and Sustainable Energy)			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	16-17 36-53	2.7.2 Process of Identification of Material Issues 5 Transformation Development Driven by Innovation
103-2	The management approach and its component	36-37 38-39	5.1 Accelerating Green Development 5.2 Breakthroughs in Independent Innovation
103-3	Evaluation of the management approach	36-37 38-39	5.1 Accelerating Green Development 5.2 Breakthroughs in Independent Innovation
GRI 302: Energy 2016			
302-1	Energy consumption within the organisation	40-43	5.3.2 Energy Consumption Management
302-3	Energy intensity	40-43 26-28	5.3.2 Energy Consumption Management 4.1 Improving Capabilities of Guaranteeing Energy Supply
Water Resources and Sewage			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	16-17 43-44	2.7.2 Process of Identification of Material Issues 5.3.3 Water Resources Management
103-2	The management approach and its component	43-44	5.3.3 Water Resources Management
103-3	Evaluation of the management approach	43-44	5.3.3 Water Resources Management
GRI 303: Water Resources and Sewage 2018			
303-2	Management of impacts related to discharge	49-50	5.3.4.3 Wastewater Management
303-3	Water withdrawal by source	43-44	5.3.3 Water Resources Management
303-4	Water withdrawal by destination	49-50	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	16-17 44-52	2.7.2 Process of Identification of Material Issues 5.3.4 Emissions Management
103-2	The management approach and its component	44-52	5.3.4 Emissions Management
103-3	Evaluation of the management approach	44-52	5.3.4 Emissions Management
GRI 305: Emissions 2016			
305-1	Direct (Scope 1) Green house gas (GHG) emissions	47-49	5.3.4.2 Management of Greenhouse Gases
305-2	Energy indirect (Scope 2) GHG emissions	47-49	5.3.4.2 Management of Greenhouse Gases
305-4	GHG emissions intensity	47-49	5.3.4.2 Management of Greenhouse Gases
305-7	Nitrogen oxides (NOx), sulphur oxides (SOx), and other significant air emissions	45-46	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	16-17 49-50 50-52	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	49-50 50-52	5.3.4.3 Wastewater Management 5.3.4.4 Waste Management
103-3	Evaluation of the management approach	49-50 50-52	5.3.4.3 Wastewater Management 5.3.4.4 Waste Management
GRI 306: Effluents and Waste 2016			
306-1	Water discharge by quality and destination	49-50	5.3.4.3 Wastewater Management
306-2	Waste by type and disposal method	50-52	5.3.4.4 Waste Management

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
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	16-17 40-53	2.7.2 Process of Identification of Material Issues 5.3 Promoting Energy Saving and Consumption Reduction Solidly
103-2	The management approach and its component	40-53	5.3 Promoting Energy Saving and Consumption Reduction Solidly
103-3	Evaluation of the management approach	40-53	5.3 Promoting Energy Saving and Consumption Reduction Solidly
GRI 307: Environmental Compliance 2016			
307-1	Non-compliance with environmental laws and regulations	40-53	5.3 Promoting Energy Saving and Consumption Reduction Solidly
Supplier Environmental Assessment			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	16-17 74-75	2.7.2 Process of Identification of Material Issues 8.1 Deepening Supply Cooperation
103-2	The management approach and its component	74-75	8.1 Deepening Supply Cooperation
103-3	Evaluation of the management approach	74-75	8.1 Deepening Supply Cooperation
GRI 308: Supplier Environmental Assessment 2016			
308-2	Negative environmental impacts in the supply chain and actions taken	74-75	8.1 Deepening Supply Cooperation

GRI Standards Indicator	GRI Standards Description	Pages	References and Remarks
GRI 400 Social			
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	16-17 63-64 64 65	2.7.2 Process of Identification of Material Issues 6.4 Caring and Safeguarding Occupational Health 6.5 Improving Employees' Safety Awareness 6.6 Tightening the Focus on Infrastructure Safety Management
103-2	The management approach and its component	63-64 64 65	6.4 Caring and Safeguarding Occupational Health 6.5 Improving Employees' Safety Awareness 6.6 Tightening the Focus on Infrastructure Safety Management
103-3	Evaluation of the management approach	63-64 64 65	6.4 Caring and Safeguarding Occupational Health 6.5 Improving Employees' Safety Awareness 6.6 Tightening the Focus on Infrastructure Safety Management
GRI 403: Occupational Health and Safety 2018			
403-2	Hazard identification, risk assessment and incident investigation	63-64	6.4 Caring and Safeguarding Occupational Health
403-7	Prevention and mitigation of occupational health and safety impacts directly related to business relationship	63-64	6.4 Caring and Safeguarding Occupational Health
403-9	Occupational injury	11-14	2.6 Table of Key Performance Indicators in 2021
Training and Education (Material Issue: Staff Training and Development)			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	16-17 69-70	2.7.2 Process of Identification of Material Issues 7.2 Promoting Employee Development
103-2	The management approach and its component	69-70	7.2 Promoting Employee Development
103-3	Evaluation of the management approach	69-70	7.2 Promoting Employee Development
GRI 404: Training and Education 2016			
404-2	Programs for upgrading employee skills and transition assistance programs	69-70	7.2 Promoting Employee 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	16-17 68-69	2.7.2 Process of Identification of Material Issues 7.1 Protecting Employees' Rights and Interests
103-2	The management approach and its component	68-69	7.1 Protecting Employees' Rights and Interests
103-3	Evaluation of the management approach	68-69	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	68-69	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	68-69	7.1 Protecting Employees' Rights and Interests
103-2	The management approach and its component	68-69	7.1 Protecting Employees' Rights and Interests
103-3	Evaluation of the management approach	68-69	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	68-69 74-75	7.1 Protecting Employees' Rights and Interests 8.1 Deepening Supply Cooperation
Supplier Social Assessment			
GRI 103: Management Approach 2016			
103-1	Explanation of the material topic and its boundary	16-17 74-75	2.7.2 Process of Identification of Material Issues 8.1 Deepening Supply Cooperation
103-2	The management approach and its component	74-75	8.1 Deepening Supply Cooperation
103-3	Evaluation of the management approach	74-75	8.1 Deepening Supply Cooperation
GRI 414: Supplier Environmental Assessment 2016			
414-2	Negative social impacts in the supply chain and actions taken	74-75	8.1 Deepening Supply Cooperation

11.5 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.