POWERING A BRIGHTER TOMORROW

Annual Report **2022**

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

STOCK CODE : 902

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.

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COMPANY PROFILE

Huaneng Power International, Inc. (the "Company" or "Huaneng Power") and its subsidiaries are mainly engaged in developing, constructing, operating and managing power plants throughout China. The Company is one of the China's largest listed power generation companies, and is the first power generation company in China to list in New York, Hong Kong and Shanghai simultaneously. As at 31 December 2022, the Company has controlled installed capacity of 127,228 MW, low carbon clean energy installed capacity of 33,171 MW and its proportion reaching 26.07%. 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 nonpublic 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 Company's direct controlling shareholder is Huaneng International Power Development Corporation ("HIPDC") and the Company's ultimate controlling shareholder is China Huaneng Group Co., Ltd. ("Huaneng Group").

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 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 660 MW high-efficiency ultra-supercritical coal-fired unit with the highest parameters in China, finished 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 has been widely applied. The Company strive to promote the construction of offshore wind power bases in the eastern coastal areas, and create advantages in the development of offshore wind power clusters. 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, 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 delisted its ADS from New York Stock Exchange ("NYSE") after market closing time on 7 July 2022, Eastern Standard Time.

DISTRIBUTION OF POWER PLANTS OF THE COMPANY

The controlled installed capacity of the Company as at 31 December 2022 was 127,228 MW, distributed in areas as depicted in the chart (Unit: MW)

CHINA NETWORK

Heilongjiang	4,086
Jilin	3,598
Liaoning	6,506
Inner Mongolia	273
Hebei	3,455
Gansu	3,897
Ningxia	20
Beijing	2,766
Tianjin	1,675
Shanxi	3,760
Shandong	23,151
Henan	8,235
Jiangsu	11,935
Shanghai	5,713
Chongqing	3,800
Zhejiang	6,778
Hubei	4,650
Hunan	3,312
Jiangxi	7,039
Anhui	2,043
Fujian	4,174
Guangdong	6,350
Guangxi	512
Yunnan	3,800
Guizhou	775
Hainan	2,916

OVERSEAS NETWORK

Singapore	2,009

Total 127,228

MAJOR CORPORATE EVENTS IN 2022

JAN

- The Company announced that power generation within China for the whole year of 2021 recorded an increase of 13.23% year-on-year.

MAR

- The Company announced its annual operating results for 2021. According to the PRC GAAPs, the net loss attributable to shareholders of the Company was RMB10,264 million, representing a year-on-year decrease of 324.85%.
- The Company held a global investor telephone conference for its annual results for 2021.
- The 120 MW photovoltaic power station project of Jiangxi Hutang of the Company was connected to the grid at full capacity.

APR

- The Company announced that on-grid electricity within China for the first quarter of 2022 recorded a year-on-year increase of 2.42%.
- The Company announced its results for the first quarter of 2022. According to the PRC GAAPs, the net loss attributable to shareholders of the Company was RMB956 million, representing a year-on-year decrease of 129.96%.
- The Company held a global investor telephone conference for its results for the first quarter of 2022.
- The 100 MW wind power project of Hunan Jiangkou of the Company was connected to the grid at full capacity.
- The Company was awarded "Outstanding Board of Directors" in the 17th Golden Roundtable Award of the Board of Directors of Listed Companies in China.

JUN

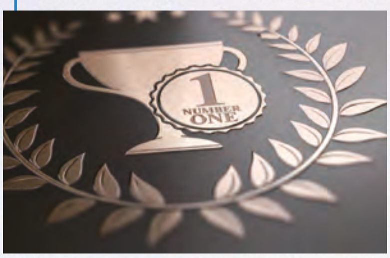
- The Company held the 2021 Annual General Meeting, and considered and approved ten proposals, including the working report from the Board of Directors of the Company for 2021.
- The Company submitted a delisting notice letter which included the Company intended to delist from NYSE voluntarily to NYSE on 17 June based on business considerations.

JUL

- The ADS of the Company delisted from NYSE after market closing time on 7 July, Eastern Standard Time.
- The Company announced that on-grid electricity within China for the first half year of 2022 record a year-on-year decrease of 5.61%.
- The Company announced its interim results for 2022. According to the PRC GAAPs, the net loss attributable to shareholders of the Company was RMB3,009 million, representing a year-on-year decrease of 167.60%.
- The Company held a global investor telephone conference for its interim results for the year of 2022.

AUG

- The Company received an "A" grade rating for annual information disclosure of Shanghai Stock Exchange.



SEP

- The "key technology of new type of high alkali coal liquid slag boiler", a national key R&D project undertaken by the Company, has reached the international leading level and passed the authentication of Chinese Society for Electrical Engineering.

OCT

- Deregistration of the Company's foreign-listed ordinary shares from United States Securities and Exchange Commission became effective on 6 October 2010, Eastern Standard Time.
- The Company announced that on-grid electricity within China for the first three quarters of 2022 recorded an decrease of 1.15% year-on-year.

MAJOR CORPORATE EVENTS IN 2022

OCT (Cont'd)

- The Company announced its results for the first three quarters of 2022. According to the PRC GAAPs, the net loss attributable to shareholders of the Company was RMB3,942 million, representing a year-on-year decrease of 477%.

- The Company held global investor telephone conference for its results for the third quarter of 2022.

- The Fifth Central-government-owned Enterprises QC (quality management) Team Results Publication Competition was held in Beijing. The pioneer QC group of Zhejiang Changxing Power Plant of the Company won the first prize for "Reducing the number of defects in incoming coal sampling devices" and the automatic optimization QC group of Shandong Huangtai Power Plant won the second prize for "Reducing the number of failures of #9 desulfurization gypsum slurry density meter".

NOV

- The Unit 2 of Qingdao Co-generation in Shandong Province of the Company successfully passed the 168-hour full-load trial operation, and the Dongjiakou Co-generation in Shandong Province satisfied the conditions for commercial operation of two units, which provided powerful support of electric power and heat power for the development of Qingdao West Coast National New District.

- The crop straw biomass-coupled power generation project for the first large coal-fired unit in China – the 680,000 kW demonstration project of crop straw biomass-coupled power generation in Unit 4 of Shandong Rizhao Power Plant of the Company, completed 72-hour trial operation and was officially put into production. The designed biomass power generation capacity of this project is 34 MW, and the annual power generation capacity is 170 million kWh after this project is put into production. The annual biomass fuel consumption is 95,500 tonnes, and the annual reduction in carbon dioxide and smoke emissions is 140,000 tonnes and 19 tonnes respectively.

- The first virtual power plant in China, which is connected to the dispatching system for real-time response adjustment – Unit 1 of Huaneng Zhejiang Virtual Power Plant of the Company completed the 72-hour trial operation and was officially put into production.

DEC

- The Company added the controlled installed capacity of grid-connected thermal power units of 2,585 MW, the controlled installed capacity of wind turbines of 3,092.55 MW, the photovoltaic controlled installed capacity of 2,935.18 MW, the hydropower controlled installed capacity of 1.4 MW, and the installed capacity of low-carbon clean energy accounted for 26.07% throughout the year.

- The No.4 supercritical pumping and condensing heating unit of Dalian Thermal Power Plant of the Company in Liaoning Province successfully passed the 168-hour full-load trial operation and was formally put into commercial operation. The operation of the units marks the four coal-fired units of Dalian Thermal Power Plant are fully operational, which adds an "important tool" for guaranteeing energy supply of regions.

- The 500,000 kW wind power project "Transfer the Power from Jilin to Shandong" of Jilin Daan of the Company was successfully connected to the grid, which is of great significance for guaranteeing the power supply in Shandong Province, optimizing the energy structure and achieving "carbon peak and carbon neutral" targets.

- One set of unit of Yangpu Natural Gas Co-generation project in Hainan of the Company successfully passed the 168-hour full-load trial operation, marking that the largest clean energy co-generation project in Hainan Province formally entered the stage of commercial operation.

- The Company's "Building a new management mode for engineering construction of new-generation coal-fired intelligent power plant based on science and technology integrated innovation" won the 2022 Power Innovation Award by the China Electricity Council.

- The Unit 5 of Shanghai Shidongkou I Power Plant of the Company successfully passed the 168-hour full-load trial operation, marking that the first demonstration project of equal capacity substitution in China formally entered the stage of commercial operation. It can support the power grid in north of Shanghai with more reliable, clean and flexible power and is highly important to promote the economic and social development of Shanghai City.

- The 2021 ESG report of the Company was selected into the List of Best Practice Cases of A-share Listed Companies in 2022 issued by China Association for Public Companies.

- The Company won the titles of "the Most Valuable Listed Company with High Quality Development" and "the Most Valuable Listed Company for Investment" in the selection event of the 12th China Securities Golden Bauhinia.

- The Company was awarded the 5A Rating of "Performance Assessment of the Secretary of the Board of Listed Companies in 2022" and the honor of "Best Practice of the Board of Listed Companies in 2022" by the China Association for Public Companies.

- The Company held the 2022 first extraordinary general meeting, and considered and approved six proposals, including the proposal regarding the continuing connected transactions between the Company and Huaneng Group for 2023.

FINANCIAL HIGHLIGHTS

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

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Note 5)

	YEAR ENDED 31 DECEMBER				
	2018	2019	2020	2021 (Restated) (Note 4)	**2022**
OPERATING REVENUE	169,550,624	174,009,401	169,446,338	205,079,497	**246,724,789**
Profit/(Loss) Before Income Tax Expense	1,973,147	3,119,460	4,773,736	(14,863,594)	**(10,813,957)**
Income Tax Expense	(643,173)	(2,011,255)	(2,163,173)	1,929,755	**(158,658)**
Profit/(Loss) After Income Tax Expense	1,329,974	1,108,205	2,610,563	(12,933,839)	**(10,972,615)**
Attributable To:					
– Equity Holders of the Company	734,435	766,345	2,377,851	(10,377,939)	**(8,026,233)**
– Non-Controlling Interests	595,539	341,860	232,712	(2,555,900)	**(2,946,382)**
Basic Earnings/(Losses) Per Share (RMB/Share)	0.03	0.01	0.04	(0.80)	**(0.65)**
Diluted Earnings/(Losses) Per Share (RMB/Share)	0.03	0.01	0.04	(0.80)	**(0.65)**

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION (Note 6)

	AS AT 31 DECEMBER				
	2018	2019	2020	2021 (Restated) (Note 4)	**2022**
Total assets	419,903,311	428,250,063	449,904,658	501,049,410	**512,221,773**
Total liabilities	303,781,641	297,871,017	298,288,460	367,213,210	**376,905,714**
Net assets	116,121,670	130,379,046	151,616,198	133,836,200	**135,316,059**
Equity holders of the Company	94,435,418	108,803,735	129,845,923	113,327,155	**115,664,522**
Non-controlling interests	21,686,252	21,575,311	21,770,275	20,509,045	**19,651,537**

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 Company and its subsidiaries have adopted Amendments to IAS 16, Property, Plant and Equipment-Proceeds before Intended Use, with the date of initial application of 1 January 2021. 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 2021, and the comparative information for the year ended 31 December 2021 was restated.

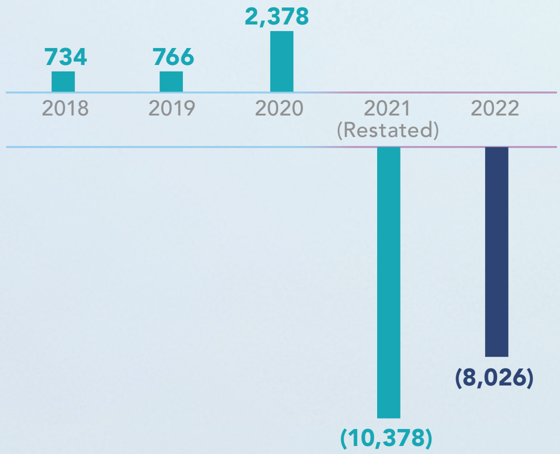
5. The results for the years ended 31 December 2018, 2019 and 2020 are derived from the historical financial statements of the Company. The results for the years ended 31 December 2021 and 2022 are set out on pages 112 to 114. All such information is extracted from the financial statements prepared under International Financial Reporting Standards ("IFRSs").

6. The consolidated statements of financial position as at 31 December 2018, 2019 and 2020 are derived from the historical financial statements of the Company. The consolidated statements of financial position as at 31 December 2021 and 2022 are set out on pages 115 to 117. All such information is extracted from the financial statements prepared under IFRSs.

PROFIT/(LOSS) ATTRIBUTABLE TO EQUITY HOLDERS OF THE COMPANY UNDER IFRSs

(RMB Million)

For the years ended 31 December



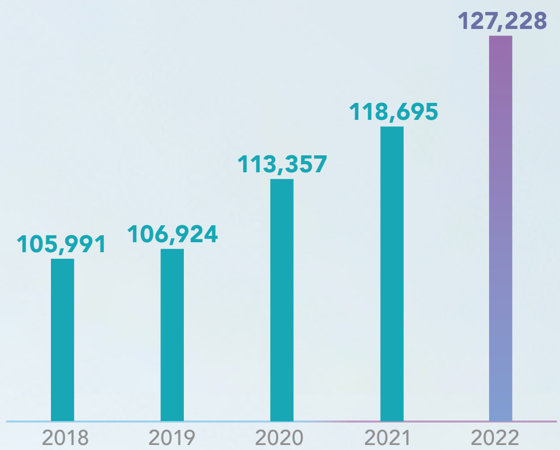
THE TOTAL ELECTRICITY SOLD BY POWER PLANTS OF THE COMPANY

(Million KWH)

For the years ended 31 December

A CONTROLLED INSTALLED GENERATION CAPACITY (MW)

As at 31 December



LETTER TO SHAREHOLDERS

ENERGY FOR BRIGHTER

TOMORROW

ZHAO KEYU

Chairman

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 2022, in the face of the tension of energy supply, the Company made active respond and scientific arrangements, actively fulfilled its duty of providing sufficient, reliable and environmentally friendly electricity to the society, and made new progress in all work. The overall safety production was stable throughout the year, the power supply remained stable, the improvement of quality and efficiency was continuously deepened, the pace of transformation and upgrading was accelerated, new achievements were made in scientific and technological innovation, and the main tasks and objectives of the year were well completed. In 2022, the Company achieved consolidated operating revenue of RMB246.725 billion, representing a year-on-year increase of 20.31%, and net loss attributable to the equity holders of the Company of RMB8.026 billion, representing a year-on-year decrease of loss of 22.66%. In view of the Company's loss for the year, taking into account the investment requirements for the transformation and development of the Company and the increase in the Company's gearing ratio in 2022, the Board of Directors of the Company proposed not to declare dividend in 2022, and the profit distribution plan would be submitted to the 2022 annual general meeting of the Company for consideration.

In 2022, the achievements of the Company's three-year special rectification of production safety were consolidated and strengthened, the comprehensive management level of equipment was further improved, and the production infrastructure remained safe and stable. In the face of the difficult situation of sharp rise in coal market price, tight supply and demand of coal and shortage of electricity supply in some areas, the Company actively fulfilled its social responsibility of ensuring safety and supply, effectively ensuring the safety of energy use in the areas for which the Company was responsible.

The Company continued to deepen the improvement of quality and efficiency, adhered to the principle of maximizing the overall interests, persisted in the overall planning of quantity and price, timely optimized the marketing strategy by taking advantage of the policy opportunity of expanding the floating range of electricity price, and strove to generate more profitable electricity. In the face of the unfavorable situation of high

LETTER TO SHAREHOLDERS

coal prices, the Company actively promoted the signing and performance of the mid-term and long-term contracts for thermal coal and the emergency supply contracts for imported coal, continuously optimized the supply structure of domestic and foreign trade, and strove to control the procurement costs of fuel coal. Tuas Power Ltd. ("Tuas Power") in Singapore, a subsidiary of the Company, overcame the shortage of natural gas supply in the international market and other factors, maintained the safe and stable operation of the units, dynamically optimized the market strategy, and achieved substantial growth in operating performance.

The Company implemented the general requirements for establishing a new power system with new energy as the priority, optimized its development planning during the "14th Five-Year Plan", formulated and implemented the action plan for peak carbon dioxide emissions, adhered to the road of green, low-carbon, clean and efficient development, and seized the development of high-quality new energy resources, thus further accelerating the pace of low-carbon transformation and upgrading. As of the end of 2022, the proportion of the installed capacity of low-carbon clean energy installation of the Company increased to 26.07%.

The Company insisted on scientific and technological innovation as the first driving force, and made new progress in the research and development of key projects. The Company completed the main research and development tasks of 700°C high temperature materials and other projects, and made more than ten technologies breakthroughs. The "technology of fully burning high-alkali coal in liquid slag boiler" promoted the conversion of the liquid ash and slag of Beijing Co-generation Power Plant of the Company to high added value, achieving

good economic benefits. For the energy-saving project of deep peak shaving process, the Company completed the test stage and carried out engineering demonstration. 10 scientific and technological achievements won the awards in the scientific and technological innovation selection organized by the China Electric Power Construction Association and the China Electricity Council.

In 2022, the Company continued to be unanimously recognized by the regulatory authorities and the capital market, and won the honors of the "A" grade rating for the annual information disclosure granted by the Shanghai Stock Exchange, the "Most Valuable Listed Company with High Quality Development" and the "Most Valuable Listed Company for Investment" issued at the 12th China Securities Golden Bauhinia, the 5A Rating of "Performance Assessment of the Secretary of the Board of Listed Companies in 2022" and "Best Practice of the Board of Listed Companies in 2022" awarded by the China Association for Public Companies, etc.

Looking forward to 2023, the Company will adhere to the general tone of striving for progress while maintaining stability, implement the new development concept completely, accurately and comprehensively, help build a new development pattern, strengthen the determination of green and low-carbon development around the Company's "14th Five-Year" plan and development strategy, make great efforts to promote the Company's transformation and development, strive to create a new situation of high-quality development of the Company, and accelerate the pace of establishing the Company as a world-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
21 March 2023

MANAGEMENT'S DISCUSSION AND ANALYSIS

The principal activities of the Company are construction, operation and management of power plants within China. The Company is one of the largest listed power generation companies in China. As of 31 December 2022, the Company had a controlled installed capacity of 127,228 MW, of which approximately 26.07% 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 IFRSs)

General

The principal activities of the Company are construction, operation and management of power plants within China. The Company is one of the largest listed power generation company in China. As of 31 December 2022, the Company had a controlled installed capacity of 127,228 MW, of which approximately 26.07% 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.

According to the amendments to IAS 16 *Property, Plant and Equipment: Proceeds before Intended Use* issued by the International Accounting Standards Board in May 2020, which was related to the proceeds from trail run stage, the Company has made retrospective adjustments to the financial data for the same period of last year.

For the year ended 31 December 2022, the consolidated operating revenue of the Company and its subsidiaries amounted to RMB246.725 billion, representing an increase of 20.31% over the same period of last year. For the influencing factors, such as coal price being in high position during the current year, the high proportion of installation of the coal-fired power plants, and profits from the new energy power plants not being enough to cover the losses from the coal-fired power plants, the annual performance of the Company is in loss position. The net loss attributable to equity holders of the Company was RMB8.026 billion, representing a decrease of loss of RMB2.352 billion over the same period of last year; the losses per share was RMB0.65.

A. OPERATING RESULTS

1. 2022 operating results

The electricity sold by the Company's domestic power plants for the year ended 31 December 2022 is as listed below (in 100 million kWh):

	Electricity Sold			
Type/Region	**2022 10-12**	Year-on-Year Change	**2022 1-12**	Year-on-Year Change
Coal-fired	**884.13**	-6.09%	**3,638.93**	-4.01%
Combined Cycle	**70.77**	9.00%	**263.48**	-1.93%
Wind-Power	**77.96**	37.42%	**274.10**	34.01%
PV	**14.62**	62.23%	**60.06**	71.29%
Hydro-power	**0.65**	-55.50%	**8.09**	-8.59%
Biomass power	**2.27**	30.64%	**7.19**	17.45%
Heilongjiang Province	**33.06**	18.05%	**120.99**	-6.08%
Coal-fired	**26.10**	13.43%	**98.89**	-13.17%
Wind-power	**6.05**	29.36%	**18.47**	35.51%
PV	**0.64**	104.10%	**3.08**	137.12%
Biomass power	**0.26**	-	**0.55**	-

Type/Region	Electricity Sold 2022 10-12	Year-on-Year Change	2022 1-12	Year-on-Year Change
Jilin Province	32.45	42.61%	113.32	28.45%
Coal-fired	21.54	21.25%	77.92	11.10%
Wind-power	9.22	173.34%	28.99	149.34%
Hydro-power	0.20	26.38%	0.96	38.18%
PV	0.56	-4.90%	2.59	5.51%
Biomass power	0.93	7.51%	2.86	-13.49%
Liaoning Province	38.29	5.00%	149.62	-18.56%
Coal-fired	33.79	-34.03%	134.22	-24.50%
Wind-power	4.07	243.19%	13.28	217.74%
Hydro-power	0.05	-39.62%	0.32	9.14%
PV	0.37	11.28%	1.81	21.80%
Inner Mongolia	2.31	16.82%	7.72	17.72%
Wind-power	2.31	16.82%	7.72	17.72%
Hebei Province	26.32	1.85%	111.88	5.26%
Coal-fired	22.71	-2.16%	99.66	-0.10%
Wind-power	2.00	5.81%	6.54	24.04%
PV	1.61	117.74%	5.69	349.42%
Gansu Province	36.13	-6.35%	146.61	1.48%
Coal-fired	30.72	-5.13%	121.71	2.17%
Wind-power	5.41	-12.69%	24.90	-1.76%
Ningxia	0.04	3.70%	0.23	3.91%
PV	0.04	3.70%	0.23	3.91%
Beijing	24.08	19.32%	82.76	-2.45%
Coal-fired	2.27	-64.94%	8.15	-37.04%
Combined Cycle	21.81	59.05%	74.61	3.77%
Tianjin	12.92	-27.94%	53.77	-17.38%
Coal-fired	10.55	-15.02%	44.13	-10.69%
Combined Cycle	2.34	-57.32%	9.50	-38.86%
PV	0.02	2.66%	0.14	5.35%
Shanxi Province	26.52	3.91%	85.85	-9.99%
Coal-fired	14.29	3.46%	49.68	-21.38%
Combined Cycle	8.39	3.57%	20.68	3.56%
Wind-power	1.98	21.91%	6.26	63.39%
PV	1.87	-6.23%	9.23	10.07%
Shandong Province	194.17	-12.24%	827.58	0.95%
Coal-fired	185.12	-13.52%	793.20	-0.46%
Wind-power	5.66	18.88%	20.53	41.49%
PV	2.31	47.76%	10.08	81.05%
Biomass power	1.07	23.58%	3.78	34.33%
Henan Province	53.59	7.28%	229.48	5.55%
Coal-fired	44.71	8.25%	192.34	6.63%
Combined Cycle	0.10	26.59%	1.34	-38.47%
Wind-power	8.73	2.52%	35.56	2.79%
PV	0.05	-14.68%	0.24	-2.64%

Type/Region	Electricity Sold 2022 10-12	Year-on-Year Change	2022 1-12	Year-on-Year Change
Jiangsu Province	100.44	-8.29%	409.93	-4.24%
Coal-fired	72.27	-13.06%	297.54	-7.98%
Combined Cycle	14.73	-2.02%	62.17	1.77%
Wind-power	12.73	18.50%	47.09	14.78%
PV	0.71	15.70%	3.14	18.96%
Shanghai	42.01	-18.18%	185.97	-7.89%
Coal-fired	38.82	-20.36%	172.18	-8.77%
Combined Cycle	3.10	21.85%	13.42	4.39%
PV	0.10	45.36%	0.37	20.93%
Chongqing	34.53	-2.24%	144.12	10.31%
Coal-fired	25.91	-5.40%	110.71	7.75%
Combined Cycle	7.47	1.21%	29.07	15.14%
Wind-power	1.15	107.96%	4.34	63.40%
Zhejiang Province	80.33	8.48%	321.16	1.14%
Coal-fired	69.78	-2.54%	293.54	-3.84%
Combined Cycle	2.90	82.35%	9.97	-4.08%
Wind-power	7.20	885.24%	15.39	1,062.24%
PV	0.45	241.10%	2.26	310.55%
Hubei Province	42.68	-3.61%	175.95	6.16%
Coal-fired	40.16	-4.99%	163.43	4.54%
Wind-power	1.84	3.78%	7.31	11.49%
Hydro-power	0.06	-70.18%	1.94	-26.68%
PV	0.63	1,189.31%	3.27	1,411.54%
Hunan Province	24.13	-23.73%	104.24	-11.04%
Coal-fired	21.97	-25.44%	93.40	-13.32%
Wind-power	1.73	24.53%	7.16	15.39%
Hydro-power	0.16	-77.22%	2.68	-2.41%
PV	0.28	170.76%	1.00	111.46%
Jiangxi Province	76.44	21.27%	290.79	27.14%
Coal-fired	72.49	21.52%	274.56	27.23%
Wind-power	2.44	7.83%	9.84	14.16%
PV	1.51	35.67%	6.39	48.59%
Anhui Province	17.62	-7.21%	71.40	16.21%
Coal-fired	13.27	-21.07%	57.71	11.05%
Wind-power	2.66	28.48%	10.50	28.80%
Hydro-power	0.04	-62.05%	0.82	-37.70%
PV	1.65	23,148.80%	2.37	33,279.90%
Fujian Province	35.45	-22.69%	146.87	-26.99%
Coal-fired	35.29	-23.01%	146.47	-27.15%
PV	0.17	620.22%	0.40	230.11%
Guangdong Province	66.86	-0.92%	279.96	-10.26%
Coal-fired	58.18	-0.59%	240.99	-11.17%
Combined Cycle	8.60	-3.33%	38.63	-4.47%
PV	0.08	42.91%	0.34	38.01%

Type/Region	Electricity Sold 2022 10-12	Year-on-Year Change	2022 1-12	Year-on-Year Change
Guangxi Province	**1.59**	-21.66%	**6.25**	-16.37%
Combined Cycle	**0.70**	-35.81%	**3.07**	-29.43%
Wind-power	**0.89**	-5.16%	**3.18**	1.78%
PV	**0.00**	-	**0.00**	-
Yunnan Province	**21.26**	5.46%	**78.64**	-4.56%
Coal-fired	**20.21**	6.56%	**74.22**	-4.31%
Wind-power	**1.06**	-9.14%	**4.32**	-5.07%
Hydro-power	**0.00**	-100.00%	**0.09**	-66.28%
Guizhou Province	**1.72**	19.81%	**8.00**	34.47%
Wind-power	**0.42**	-8.06%	**1.71**	-7.82%
PV	**1.30**	32.78%	**6.29**	53.61%
Hainan Province	**25.45**	17.20%	**98.78**	-12.68%
Coal-fired	**23.98**	20.97%	**94.31**	-10.64%
Combined Cycle	**0.64**	-37.23%	**1.01**	-78.52%
Wind-power	**0.42**	-8.97%	**1.04**	10.40%
Hydro-power	**0.15**	-26.45%	**1.28**	45.46%
PV	**0.26**	27.27%	**1.15**	8.39%
Total	**1,050.40**	-2.32%	**4,251.86**	-1.44%

Note: According to the amendments to IAS 16 *Property, Plant and Equipment: Proceeds before Intended Use* issued by the International Accounting Standards Board in May 2020, which was related to the proceeds from trail run stage, the on-grid electricity generated during the trail run stage was included in the amount of electricity sold, and the amount of electricity sold of the same period of last year was restated.

The decrease in the Company's electricity sold was mainly attributable to the following factors: (1) the electricity consumption of the whole society in the fourth quarter of 2022 was at a low level, which led to a decrease of the Company's electricity generation compared to the same period of last year, (2) given the factors of the high level of the coal price throughout the whole year, the expansion of electricity market transaction scale, and the lower growth of the expected electricity consumption, etc., the Company optimized the power units operation mode, arranged the maintenance reasonably, and generated more economic electricity, on the condition of guarantee the supply of electricity and heating, resulting in a year-on-year decline in thermal power generation, (3) the Company has been making further efforts on promoting green and low carbon operation, and the Company's wind and photovoltaic power generation kept increasing, and the generation of new energy has increased rapidly year on year, which has narrowed the decline of the annual cumulative power generation.

For the year ended 31 December 2022, the accumulated power generation of Tuas Power, the Company's wholly owned subsidiary in Singapore, accounted for a market share of 22.3%, representing an increase of 3.1 percentage points from the same period of last year.

In respect of tariff, the Company's domestic average tariff (inclusive of taxes) for the year ended 31 December 2022 was RMB509.92 per MWh, increased by 18.04% from last year. For the operation in Singapore, the average tariff for the year ended 31 December 2022 was RMB944.00 per MWh, representing an increase by 58.80% from the same period of last year.

In respect of fuel costs, due to the sharp increase in fuel purchase prices, the Company's fuel cost per unit of power sold by domestic coal-fired power plants increased by 17.73% to RMB372.56 per MWh from the same period of last year.

Influenced by the forgoing factors, for the year ended 31 December 2022, the Company and its subsidiaries recorded a consolidated operating revenue of RMB246.725 billion, representing an increase of 20.31% from RMB205.079 billion (restated) of last year, and the operating costs and expenses of RMB247.657 billion, representing an increase of 17.63% from RMB210.547 billion (restated) of last year, and the net loss before income tax was RMB10.814 billion, representing a decrease of loss of RMB4.050 billion from the net loss before income tax of RMB14.864 billion (restated) of last year.

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 2022, the consolidated operating revenue of the Company and its subsidiaries amounted to RMB246.725 billion, representing an increase of 20.31% from RMB205.079 billion (restated) for the year ended 31 December 2021. The operating revenue from domestic operations increased by RMB29.052 billion over the same period of last year, mainly due to the increase of the domestic average tariff over the same period of last year, including an increasing of RMB29.327 billion due to the increase of tariff and a decrease of RMB2.378 billion due to the decrease of electricity sold. The operating revenue from domestic operations of the Company generated from the newly acquired entities and newly operated generating units was RMB9.109 billion, and the operating revenue from domestic operations of the Company generated from the existing generating units was RMB19.943 billion. The operating revenue from the operations in Singapore increased by RMB12.107 billion over the same period of last year, representing an increase of 74.11%. This is mainly due to the increase of the tariff and electricity sales in Singapore over the same period of the last year. The operating revenue from the operations of Pakistan increased by RMB0.487 billion, representing an increase of 9.29% over the same period of last year, mainly due to the increase of the tariff over the same period of last year.

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 2022, the tax and levies on operations of the Company and its subsidiaries were RMB1.442 billion, representing a decrease of RMB0.244 billion from RMB1.686 billion (restated) for the same period of last year. This was mainly due to the decrease in the value-added tax paid by domestic operations.

2.2 Operating expenses

For the year ended 31 December 2022, the total operating expenses of the Company and its subsidiaries was RMB247.657 billion, representing an increase of 17.63% from the same period of last year. The operating expenses in domestic operations increased by RMB26.015 billion, or 13.65%, from the same period of last year, of which the newly acquired entities and the new generating units accounted for RMB6.171 billion; the costs attributable to the existing entities increased by RMB19.844 billion, which was primarily attributable to the increase in the fuel cost led by the sharp increase in domestic coal price over the same period of last year.

The operating expenses from the operations in Singapore increased by RMB10.393 billion, or 65.24%, from the same period of last year, mainly due to the increase of fuel cost and operating cost of purchasing electricity. The operating expenses from the operations in Pakistan increased by RMB0.701 billion, mainly due to the increase in fuel cost caused by the increase in the coal price Pakistan.

2.2.1 Fuel costs

Fuel costs accounted for the majority of the operating expenses for the Company and its subsidiaries. For the year ended 31 December 2022, fuel costs increased by 16.19% to RMB170.507 billion from RMB146.752 billion (restated) for the year ended 31 December 2021. The fuel costs from domestic operations increased by RMB20.244 billion, which was mainly attributable by the sharp increase in domestic coal price. The fuel costs of the newly acquired entities and new generating units were RMB3.775 billion and the fuel costs of the existing generating units increased by RMB16.469 billion from same period of last year. Fuel costs in Singapore increased by RMB3.511 billion from the same period of last year, mainly due to increase of natural gas price, as a result of the increase of global oil price. The fuel cost per unit of power sold by the Company's domestic power plants increased by 17.73% to RMB372.56/MWh from RMB316.45/MWh in 2021.

2.2.2 Maintenance

For the year ended 31 December 2022, the total maintenance expenses of the Company and its subsidiaries amounted to RMB4.485 billion, which was approximately the same as the last year with RMB4.504 billion.

2.2.3 Depreciation

For the year ended 31 December 2022, depreciation expenses of the Company and its subsidiaries increased by RMB2.105 billion to RMB24.380 billion from RMB22.275 billion (restated) for the year ended 31 December 2021. The depreciation expenses of domestic operations increased by RMB1.560 billion compared to the same period of last year, of which the depreciation costs incurred by the newly acquired entities and new generating units was RMB1.786 billion, the depreciation expense of existing units decreased by RMB226 million. Depreciation expenses of Singapore business were basically the same year on year.

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 2022, the labor costs of the Company and its subsidiaries amounted to RMB16.148 billion, which was approximately the same as RMB16.117 billion (restated) of 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 gains or losses on disposal of properties, plant and equipment. For the year ended 31 December 2022, other operating expenses of the Company and its subsidiaries was RMB32.137 billion, representing an increase of RMB11.238 billion from RMB20.899 billion (restated) for the year ended 31 December 2021. The other operating expenses from the Company's domestic operations increased by RMB3.769 billion, mainly due to the increase of the assets impairment losses and R&D expenses related to the major business operation over the same period of last year. Other operating expenses of the operations in Singapore increased by RMB6.768 billion over the same period of last year, mainly due to the increase of operating cost of purchasing electricity as a result of the increase of tariff in Singapore. Other operating expenses of the operations in Pakistan increased by RMB0.701 billion over the same period of last year, mainly due to the increase of fuel costs led by the increase in coal price.

2.3 Financial expenses

Financial expenses consist of interest expense, bank charges and net exchange gains or losses.

2.3.1 Interest expense

For the year ended 31 December 2022, the interest expense of the Company and its subsidiaries was RMB9.962 billion, representing an increase of RMB1.164 billion from RMB8.798 billion for the year ended 31 December 2021. The interest expense from the Company's domestic operations increased by RMB933 million, mainly due to the increase of the scale of the interest-bearing debts over the same period of last year. The interest expense from the newly acquired entities and new generating units was RMB0.892 billion and those incurred by the domestic existing entities increased by RMB41 million. The interest expense of Singapore operations increased by RMB104 million compared to the same period of last year. Interest expense of Pakistan operations increased by RMB127 million over the same period of last year.

2.3.2 Net exchange gains or losses and bank charges

For the year ended 31 December 2022, the Company and its subsidiaries recorded a net gain of RMB136 million from net exchange difference and bank charges, representing an increase of RMB176 million in gain compared with the net loss of RMB40 million for the year ended 31 December 2021. The sum of exchange gains and losses and bank charge fee of domestic business was a net loss of RMB74 million, representing an increase of loss amounting to RMB71 million compared with the net loss of RMB3 million for the year ended 31 December 2021, mainly due to the net US dollar liabilities exposure of the domestic business and the increase of foreign exchange rate of the US dollar against RMB. The operations in Singapore recorded net gain of RMB2 million in exchange changes and bank charges, representing an increase of RMB90 million in gain from the net loss of RMB88 million for the year ended 31 December 2021, mainly due to the net US dollar liabilities exposure of Singapore business and the rapid decrease of the foreign exchange rate of US dollar against Singapore dollar in the fourth quarter of 2022. The operations in Pakistan recorded net gains of RMB208 million in exchange differences and bank charges, representing an increase in net gains of RMB157 million as compared to a net gains of RMB51 million for the year ended 31 December 2021, mainly due to the net US dollar assets exposure of Pakistan business and the increase of the foreign exchange rate of US dollar against Pakistani rupees.

2.4 Share of profits less losses of associates and joint ventures

For the year ended 31 December 2022, the share of profits less losses of associates and joint ventures was RMB1.042 billion, representing an increase of RMB194 million from RMB0.848 billion (restated) of last year. This is mainly due to the increase in net profits of Hebei Hanfeng Power Co., Ltd. and other associates/joint ventures.

2.5 Income tax expense

For the year ended 31 December 2022, the Company and its subsidiaries recognized income tax expense of RMB159 million, representing an increase of expense of RMB2.089 billion from income tax credit of RMB1.930 billion for the year ended 31 December 2021. The income tax expenses from domestic operation increased by RMB1.797 billion, mainly due to the increase of the profits of new energy power generation such as domestic wind power generation business over the same period of last year, as well as no deferred tax assets recognised for the loss of some subsidiaries which did not meet the recognition conditions. The income tax expense for the operations in Singapore increased by RMB290 million, mainly due to the profit growth of Singapore business over the same period of last year. The income tax expenses for the operations in Pakistan was approximately the same over the same period of last year.

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

For the year ended 31 December 2022, the Company and its subsidiaries achieved a net loss of RMB10.973 billion, representing a decrease of loss of RMB1.961 billion, from a net loss of RMB12.934 billion (restated) for the year ended 31 December 2021. The net loss attributable to equity holders of the Company was RMB8.026 billion, representing a decrease of RMB2.352 billion from the net loss attributable to equity holders of the Company of RMB10.378 billion (restated) for the year ended 31 December 2021. For the influencing factors, such as coal price being in high position during the current year, the high proportion of installation of the coal-fired power plants, and profits from the new energy power plants not being enough to cover the losses from the coal-fired power plants, the annual performance of the Company is in loss position.

The loss attributable to equity holders of the Company from the domestic operations decreased by RMB0.999 billion. The net profit attributable to equity holders of the Company from the operations in Singapore was RMB1.548 billion, representing an increase of RMB1.425 billion as compared to the same period last year, mainly due to the sharp increase of tariff in Singapore over the same period of last year, which led to the increase of margin over the same period of last year. The net profit attributable to equity holders of the Company from the operations in Pakistan was RMB232 million, representing a decrease of RMB72 million.

The Company's recorded loss from its non-controlling interests of RMB2.946 billion for the year ended 31 December 2022 as compared to the loss of RMB2.556 billion (restated) for the year ended 31 December 2021, representing an increase of loss amounted to RMB0.390 billion, mainly due to the 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 2022, the total assets of the Company and its subsidiaries were RMB512.222 billion, increased by 2.23% from RMB501.049 billion (restated) as of 31 December 2021; total assets of the domestic operations increased by RMB7.229 billion to RMB467.788 billion, including a net increase of RMB15.493 billion in fixed assets, mainly due to the comprehensive impact of new capital infrastructure investment and accrual depreciation in the current year, and a net decrease in inventory of RMB5.917 billion, which mainly due to the decrease of quantity and coal price at the end of 2022 compared with the year end of 2021.

As of 31 December 2022, the total assets of the operations in Singapore were RMB29.597 billion, representing an increase of RMB2.508 billion from the same period of last year. Non-current assets increased by RMB1.567 billion to RMB24.134 billion compared with the year end of 2021. Current assets increased by RMB942 million to RMB5.463 billion compared with the year end of 2021. The total assets of the operations in Pakistan were RMB14.837 billion, representing an increase of RMB1.435 billion compared with the year end of 2021. Non-current assets amounted to RMB8.160 billion, which was approximately the same with last year. Current assets amounted to RMB6.677 billion, representing an increase of RMB1.572 billion compared with the year end of 2021.

2.7.2 Comparison of liability items

As of 31 December 2022, the total liabilities of the Company and its subsidiaries were RMB376.906 billion, representing an increase of 2.64% from RMB367.213 billion as of 31 December 2021.

As of 31 December 2022, interest-bearing debts of the Company and its subsidiaries amounted to RMB307.118 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 2022, the total liabilities of the operations in Singapore were RMB17.206 billion, representing an increase of RMB2.006 billion from RMB15.200 billion as of 31 December 2021. As of 31 December 2022, the total liabilities of the operations in Pakistan were RMB11.085 billion, representing an increase of RMB1.489 billion from RMB9.596 billion as of 31 December 2021.

2.7.3 Comparison of equity items

The total equity attributable to the equity holders of the Company increased by RMB2.337 billion as of 31 December 2022 as compared to 1 January 2022, mainly due to the issuances of the Energy Supply Special Bonds (recorded as other equity instruments) of RMB13.550 billion, the comprehensive loss of RMB8.115 billion in the current year, a decrease of RMB2.137 billion arising from the declaration of interests for other equity instruments and a decrease of RMB0.961 billion due to other reasons. Non-controlling interests decreased by RMB858 million as compared to 1 January 2022.

2.7.4 Major financial position ratios

	2022	2021
Current ratio	**0.51**	0.50
Quick ratio	**0.43**	0.41
Ratio of liability to equity holders' equity	**3.26**	3.24
Multiples of interest earned	**-0.08**	-0.60

Formula of the financial ratios:

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

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

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

Interest earned multiple = $\frac{\text{(profit before tax + interest expense)}}{\text{interest expense (including capitalized interest)}}$

The current ratio and quick ration as of 31 December 2022 increased, mainly due to the decrease of current liabilities compared to 1 January 2022. The decrease of current liabilities mainly due to the decline of short-term loans, short-term bonds, and long-term bonds due within one year compared to 1 January 2022. The ratio of liabilities to equity holders' equity as of 31 December 2022 increased, mainly due to the comprehensive impacts of the Company's increased investment, operating losses and the issuance of the special bonds (other equity instruments) for energy conservation and supply. The multiples of interest earned were negative, but improved during this year, mainly due to the Company's year-on-year loss reduction.

B. LIQUIDITY AND CASH RESOURCES

1. Liquidity

	2022 RMB billion	2021 RMB billion (Restated)	Change %
Net cash generated in operating activities	32.520	6.251	420.23%
Net cash used in investing activities	-39.830	-42.494	-6.27%
Net cash generated in financing activities	7.831	39.386	-80.12%
Currency exchange impact	0.441	-0.846	-152.15%
Net increase in cash and cash equivalents	0.962	2.297	-58.11%
Cash and cash equivalents as at the beginning of the year	15.555	13.258	17.33%
Cash and cash equivalents as at the end of the year	16.517	15.555	6.19%

For the year ended 31 December 2022, net cash generated in operating activities of the Company and its subsidiaries was RMB32.520 billion, representing an increase of 420.23% from last year, mainly due to the decrease of the operating loss, the increases of collection of prior years' renewable energy subsidies and the decrease of fund occupation from inventories as compared to that of the same period of last year. The net cash generated in operating activities in Singapore was RMB2.443 billion. The net cash generated in operating activities in Pakistan was RMB1.204 billion. The net cash used in investing activities was RMB39.830 billion for the year ended 31 December 2022, mainly consisted of the investment in the construction, including purchase of non-current assets, construction expenditure and construction materials, representing a decrease of 6.27%, and the decrease compared with the same period of last year was mainly due to the decline of the expenditure on large and medium-sized construction projects. The net cash generated in financing activities was RMB7.831 billion for the year ended 31 December 2022, representing a decrease of 80.12% as compared with last year, which was mainly due to the significant increase of net cash generated in operating activities, which greatly supported capital expenditure and thus net cash generated from financing decreased significantly. As of 31 December 2022, the cash and cash equivalents of the Company and its subsidiaries denominated in RMB, Singapore dollar, U.S. dollar and other currencies were RMB14.145 billion, RMB1.403 billion, RMB464 million, and RMB504 million, respectively.

As of 31 December 2022, net current liabilities of the Company and its subsidiaries were approximately RMB84.611 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.

2. Capital expenditure and fund resources

2.1 Capital expenditure on infrastructure construction and renovation projects

The actual capital expenditure of the Company and its subsidiaries in 2022 was RMB40.014 billion, which was mainly used for the construction of infrastructure and renovation, including RMB3.258 billion for Zhejiang Cangnan Offshore Wind-power, RMB1.681 billion for Zhuanghe Wind-power, RMB1.336 billion for Shidongkou I, RMB969 million for Shantou Haimen Offshore Wind-power, RMB880 million for Da'an Clean Energy, RMB823 million for Yangpu Co-generation, RMB810 million for

Sheyang New Energy Power Generation, RMB727 million for Dalian Co-generation, RMB722 million for Diandong Yuwang Mining, RMB694 million for Jiangxi Clean Energy, RMB656 million for Mengcheng Wind-power, RMB642 million for Yuhuan Power, RMB637 million for Ranghuluqu Clean Energy, RMB636 million for Zaoyang New Energy, RMB605 million for Licheng Yingheng Clean Energy, RMB560 million for Yangjie New Energy, RMB552 million for Qingdao Co-generation, RMB548 million for Dalian Chuanbo (Offshore Wind Power), RMB524 million for Huajingchen New Energy, RMB497 million for Diandong Power Mining Branch, RMB495 million for Dashiqiao New Energy, RMB478 million for Napo Clean Energy, RMB449 million for Yangzhao New Energy, RMB433 million for Rongshui New Energy, RMB388 million for Qujing Zhanyi New Energy, RMB388 million for Yangyuan New Energy, RMB376 million for Shanyan (Shouguang) New Energy, RMB366 million for Lantian Co-generation, RMB355 million for Huangtai Power, RMB348 million for Jiangsu Comprehensive Energy Service. Capital construction and renovation expenditures for other projects were RMB18.181 billion.

The above capital expenditures are sourced mainly from internal capital, cash flows from 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 and renovation expenditures. The Company expects to finance the above capital expenditures through internal capital, cash flows from operating activities, and debt and equity financing.

The cash requirements, usage plans and cash resources for future basic construction and renovation of the Company are as following:

(Unit: RMB100 million)

Project	Capital Expenditure Plan for 2023	Cash resources arrangements	Financing costs and note on use
Thermal power projects	53.90	Including internal capital and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Hydropower projects	0	Including internal capital and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Wind power projects	118.36	Including internal capital and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Coal mining projects	9.50	Including internal capital and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Photovoltaic power projects	140.00	Including internal capital and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Ports	0	Including internal capital and bank loans	Within the floating range of benchmark lending interest rates of PBOC
Technology renovation etc.	79.82	Including internal capital 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 2022, the unutilized banking facilities available to the Company and its subsidiaries amounted over RMB290.0 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 5, January 7, February 9, February 11, March 17, July 7, July 8, July 20, August 3, September 8, September 9, September 14, October 21, October 27, November 4, November 18, November 29 and December 8, at principal amount of RMB2 billion, RMB2 billion, RMB2 billion, RMB2 billion, RMB2 billion, RMB3 billion, RMB3 billion, RMB2 billion, RMB2.5 billion, RMB2 billion, RMB0.3 billion, RMB2 billion, RMB3 billion, RMB3 billion, RMB3 billion, RMB3 billion, RMB2 billion and RMB3 billion, with nominal annual interest rates of 2.1%, 2.08%, 2.0%, 2.0%, 2.0%, 1.54%, 1.54%, 1.48%, 1.47%, 1.25%, 1.66%, 1.25%, 1.48%, 1.47%, 1.53%, 2.09%, 1.73% and 1.83%, respectively. Each installment of the notes was denominated in RMB, issued at par value, and would successively mature in 58 days, 46 days, 41 days, 32 days, 90 days, 29 days, 32 days, 58 days, 90 days, 35 days, 180 days, 37 days, 32 days, 33 days, 32 days, 61 days, 30 days and 34 days from the value date.

The Company, through its subsidiary SinoSing Power, issued two tranches of secured corporate bonds of US$300 million and US$300 million on 20 February 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 International.

As of 31 December 2022, short-term loans of the Company and its subsidiaries were RMB83.573 billion (2021: RMB91.897 billion). Loans from banks were charged at interest rates ranging from 1.24% to 18.01% per annum (2021: 2.00% to 11.35%).

As of 31 December 2022, short-term bonds payable by the Company and its subsidiaries were RMB6.313 billion (2021: RMB8.223 billion).

As of 31 December 2022, the Company and its subsidiaries' long-term loans (including long-term loans due within one year) totaled RMB170.808 billion (2021: RMB154.072 billion), including RMB loans of RMB154.611 billion (2021: RMB138.436 billion), USD loans of USD1.495 billion (2021: USD1.187 billion), EUR loans of EUR2 million (2021: EUR7 million), SGD loans of SGD1.092 billion (2021: SGD1.325 billion), JPY loans of 2.044 billion yen (2021: 2.151 billion yen). Among them, Singapore dollar loans are floating rate loans, and EUR loans and Japanese yen loans are fixed interest rate loans. For the year ended 31 December 2022, the annual interest rate of long-term loans is 0.75% to 6.75% (2021: 0.75% to 4.98%).

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 2022, the board of directors proposed that the Company pay no dividends in year 2022. 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.

2.4 Maturity profile of interest-bearing debts

(Unit: RMB100 million)

Maturity Profile	2023	2024	2025	2026	2027
Principal amount planned for repayment	1,096.74	312.78	508.94	206.25	139.01
Interest amount planned for repayment	78.71	59.35	47.06	34.65	30.60
Total	1,175.45	372.13	556.00	240.90	169.61

Note: The amount of principle to be paid in 2023 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 strengthen 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 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 adheres to the strategies of increasing profitability, improving efficiency and creating value, reinforces its operational management, improves its management efficiency, optimizes its asset structure, comprehensively improves its modern operating and management level, vigorously promotes the improvement of quality and efficiency, improves corporate governance, enhances the Company's brand value and conscientiously performs its social responsibilities.

D. TREND ANALYSIS

The Central Economic Work Conference emphasized that we should adhere to the general principle of seeking progress while maintaining stability, comprehensively deepen reform and opening up, and vigorously boost market confidence in 2023. The Conference called for adhering to the principle of "priority on stabilization, and advancement from stabilization", continuing to implement a proactive fiscal policy and a stable monetary policy, intensifying macro-policy control, coordinating with various policies, and forming a joint force to promote high-quality development. We should optimize the implementation of industrial policies, pay close attention to the transformation and upgrading of traditional industries and the cultivation and expansion of strategic emerging industries, and forge new industrial competitive advantages in the process of implementing the objectives and tasks of carbon peak and carbon neutralization.

In terms of the power 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, temperature in winter and summer and low base in 2022, it is estimated that the electricity consumption of the whole society will have a year-on-year increase of approximately 6% in 2023; driven by the rapid development of new energy power generation, it is estimated that the total installed power generation capacity and the installed power generation capacity of non-fossil energy will reach a new high in 2023, and the newly installed power generation capacity nationwide is expected to reach about 250 million kilowatts.

In terms of the power market, the requirements of "the Notice on Further Deepening the Market-based Reform of the On-grid Tariff 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》) issued by the NDRC in 2022 have been implemented. The electricity generated by coal-fired has been totally entered into trade within the electricity grid market and the floating range of transaction prices of the electricity has been expanded to 20%. In 2023, the state requires a high proportion of medium-and long-term electricity transactions to be signed, and the directories of high-energy-consuming enterprises in various places will be launched one after another, and the coal price is expected to decline, so the operating conditions of coal-fired power generation enterprises will be improved to some extent. However, with the full spread of the spot market and the intensified competition in the electricity market, the market uncertainty will further increase. Due to the increase in new energy parity production projects and the increase in market entry rate, the electricity prices of wind power and photovoltaic are expected to decline.

In terms of the carbon market, the Ministry of Ecology and Environment of the People's Republic of China issued the Notice of Implementation of Relevant Work on Distribution of National Carbon Emission Rights Trading Quota for 2021 and 2022 (《關於做好二零二一、二零二二年度全國碳排放權交易配額分配相關工作的通知》) on 15 March. According to the quota distribution plan, the carbon emission benchmark value has been adjusted downward and the quota distribution has been greatly tightened. With the gradual promotion of peak carbon emissions and carbon neutrality, the cost of carbon emission performance will increase.

In terms of the coal market, policy-based supply guarantee will continue to exert efforts to promote the release of advanced coal production of newly licensed capacity. However, since most of the newly licensed capacity has been released in the previous two years, there is limited room for substantial increase in production. In the international market, with the increase of coal production in Indonesia and India, the import and purchase opportunities of Mongolian coal, Russian coal and Australian coal increase, and the supplementary role of imported coal in China is enhanced. On the demand side, the proportion of non-fossil energy electricity will continue to increase in 2023, and the growth rate of coal consumption will further slow down. In 2023, under the policy guarantee, the performance rate of mid-term and long-term contracts for coal will be improved, and the "cornerstone" role of long-term coal associations will be effectively brought into play. It is expected that the supply and demand of the coal market will be eased and the coal price center will move down.

In terms of the capital market, according to the report on the work of the State Council and the monetary policy implementation report of the People's Bank of China, in 2023, a stable monetary policy will be precise and powerful to make cross-cycle adjustment, which will not only support the expansion of domestic demand and provide stronger support for the real economy, but also give consideration to short-term and long-term, economic growth and price stability, internal balance and external balance, stabilize the sustainable support for the real economy and maintain reasonable and 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 22 April 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 2022, Shenzhen Energy distributed cash dividend amounting to RMB1.75 (tax inclusive) of every 10 shares to its shareholders, and the Company held 1,190 million shares of Shenzhen Energy by 31 December 2022. These investments brought a net profit to the Company of RMB297 million for the year ended 31 December 2022 under IFRSs. 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 China Huaneng Group Co., Ltd. ("Huaneng Group") the controlling shareholder of Sichuan Energy Development. This investment brought a net profit to the Company of RMB196 million for the year ended 31 December 2022 under IFRSs. This investment is expected to provide steady returns to the Company.

F. EMPLOYEE BENEFITS

As of 31 December 2022, the Company and its subsidiaries had 57,069 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 2022, the Company provided guarantee for long-term loans of Tuas Power in the amount of RMB3.109 billion (31 December 2021: RMB6.257 billion). As of 31 December 2022, the Company provided guarantees for long-term loans of RMB237 million of the Company's domestic subsidiaries (31 December 2021: nil).

As of 31 December 2022, long-term loans of approximately RMB199 million (approximately US$29 million) (31 December 2021: RMB176 million (approximately US$28 million)) were guaranteed by Huaneng Shandong Power Generation Co., Ltd. ("Shandong Power").

As of 31 December 2022, long-term loans of approximately RMB6,766 million (31 December 2021: RMB6,794 million) were guaranteed by Shandong Power, China Export & Credit Insurance Corporation and Jining Chengtou Holding Group Co., Ltd. ("Jining Chengtou") at the liability ratios of 17.5%, 65.0% and 17.5% respectively (31 December 2021: Shandong Power, China Export & Credit Insurance Corporation and Jining Chengtou at the liability ratios of 17.5%, 65.0% and 17.5% respectively).

As of 31 December 2022, long-term loans of approximately RMB1,116 million (31 December 2021: RMB1,020 million) were guaranteed by Shandong Power and Jining Chengtou at the liability ratios of 50.0% and 50.0% respectively (31 December 2021: Shandong Power and Jining Chengtou at the liability ratios of 50.0% and 50.0% respectively).

As of 31 December 2022, the details of secured loans of the Company and its subsidiaries were as follows:

As of 31 December 2022, short-term loans of RMB361 million (31 December 2021: RMB829 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 2022, short-term loans of RMB0.772 billion (31 December 2021: RMB0.387 billion) of the Company and its subsidiaries were secured by certain property, plant and equipment with net book value of approximately RMB1.519 billion (31 December 2021: RMB0.475 billion).

As of 31 December 2022, long-term loans of RMB4.633 billion (31 December 2021: RMB4.595 billion) of the Company and its subsidiaries were secured by certain property, plant and equipment with net book value of approximately RMB6.984 billion (31 December 2021: RMB5.025 billion).

As of 31 December 2022, long-term loans of approximately RMB4.794 billion (31 December 2021: RMB4.516 billion) were secured by electricity and heat receivables of the Company and its subsidiaries. Long-term loans of approximately RMB461 million (31 December 2021: RMB approximately 2,814 million) were secured by equity interests of the Company and its subsidiaries. Long-term loans of approximately RMB50 million were secured by carbon emission trading rights (31 December 2021: approximately RMB20 million). Long-term loans of approximately RMB44 million were secured by franchise (31 December 2021: nil).

As of 31 December 2022, the restricted bank deposits of the Company and its subsidiaries were RMB658 million (31 December 2021: RMB796 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 IFRSs.

I. RISK FACTORS

1. Risks relating to the electricity industry and market

(i) In 2023, with the implementation of a series of national policies and measures to stabilize the economy, it is expected that the domestic economic operation will generally rebound and the electricity consumption of the whole society will increase year-on-year, which will increase the pressure on the supply of electricity and fuel, and the continuous loss of coal-fired power enterprises will lead to a decline in the overall support capacity. In extreme weather and peak load, there may be the risk of power supply shortage in some areas in individual periods.

(ii) With the construction of the new electricity market, the differentiated competition among different energy types across provinces and regions is more intense, and there is downside risk in electricity price.

(iii) With a large number of affordable new energy projects entering the market, the new energy in the country has maintained rapid growth. The guaranteed volume of fixed-price purchase of electricity continued to decline and the scale of participation in market transactions gradually expanded. The characteristics of new energy power generation lead to the widespread participation in market-oriented transactions in the form of price reduction, which has the risk of declining returns.

The Company will actively pursue a green transformation, accelerate its adoption of clean energy, optimize and upgrade the composition of its installed capacity. The Company is also committed to strengthening its policy research effort, actively adapting to the development of the power sector as guided by the carbon peak and carbon neutrality goal, continuing to promote the standardization of market operation, adjusting pricing strategies in a timely manner, and making every endeavor to prevent and control risks relating to electricity price.

2. Risks relating to fuel procurement market

(i) The national policy of increasing production and ensuring supply has continued to develop, domestic coal output has increased rapidly, and thermal coal has maintained a high supply. However, since most of the additional production capacity has been released in the previous two years, the space for increasing production significantly is limited, and the actual supply increment is uncertain.

(ii) With the overall recovery of the national macro-economy, the electricity consumption of the whole society will be improved, and there will be intermittent supply shortage in some areas. Thermal power will continue to be relied upon to ensure that energy demands are met, and coal supply is still under great pressure.

(iii) Affected by the uncertainty of the international situation and other factors, the global energy supply is tight, the amount of imported coal is unlikely to increase significantly, and there is uncertainty in the downward trend of the price center of imported coal, which may lead to a staged shortage of supply and demand in the domestic coal market.

(iv) Under the market situation of tight coal supply and demand and high price, it is difficult to fully implement the three 100% policy requirements of the NDRC on mid- and long-term contracts for thermal coal. Coal prices remain high and the dual challenges of ensuring sufficient fuel supply and controlling fuel price have surfaced.

The Company will closely follow the changes in the coal market, implement the national policy requirements and promote the signing of mid-term and long-term contracts for power coal to strive to improve the coverage of long-term contracts. The Company will strictly implement the price mechanism in accordance with national policies, strengthen the performance of long-term contracts and improve the fulfilment of mid- and long-term contracts to give full play to the "cornerstone" role of long-term contracts. The Company will optimize and adjust the supply structure of underground coal, accurately purchase imported coal, open up and implement domestic trade alternative resources to effectively control coal prices and ensure the safe and stable supply of coal. The Company will 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 control the cost of coal procurement.

3. Risks relating to carbon markets

The Ministry of Ecology and Environment of the People's Republic of China issued the Notice of Implementation of Relevant Work on Distribution of National Carbon Emission Rights Trading Quota for 2021 and 2022 （《關於做好二零二一、二零二二年度全國碳排放權交易配額分配相關工作的通知》） on 15 March 2023. According to the quota distribution plan, the carbon emission benchmark value has been adjusted downward and the quota distribution has been greatly tightened. Meanwhile, trading entities such as institutions and individuals will be included in the carbon market in the future, which may further push up the carbon transaction price and may result in an increase of fulfillment cost for carbon trades by electricity generating companies.

The Company will pay close attention to national carbon market policies and the progress of restarting voluntary emission reduction projects, continue to strengthen carbon trading management, optimize carbon trading strategies, and strive to complete the second cycle of national carbon market trading performance work on schedule at a lower cost.

4. Environmental protection risk

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, 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. and may increase the environmental protection expenditure of relevant grass-roots enterprises.

The Company strictly implements the national environmental protection policy. 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 coal-fired units in China have also completed ultralow emission transformation pursuant to the regulations 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. Meanwhile, the Company actively follows up the concerns of environmental protection authorities, cautiously selects advanced and applicable technical solutions, and makes positive efforts to upgrade its water-saving and wastewater treatment systems, build closed facilities for coal yards, and improve the recycling and utilization of coal ash and slag in order to ensure that various environmental risks are addressed and effectively resolved in a timely manner.

5. Capital market risks

According to the report on the work of the State Council and the monetary policy implementation report of the People's Bank of China, in 2023, a prudent monetary policy will be precise and powerful to make cross-cycle adjustment, which will not only support the expansion of domestic demand and provide stronger support for the real economy, but also give consideration to short-term and long-term, economic growth and price stability, internal balance and external balance, stabilize the sustainable support for the real economy and maintain reasonable and 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 2023, the Company will focus on the improvement of operating results, enhance capital operation, innovate financing methods and further expand financing channels. The Company will also take advantage of green finance policy and issue energy supply special bonds. The Company will speed up capital turnover by means of increasing 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 and prevent capital risks, to realize cost reduction and efficiency improvement.

CORPORATE GOVERNANCE REPORT

The Company has been consistently stressing the importance of corporate governance. The Company has 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, mutual checks and balances and coordinated operations between proprietorship, decision-making power, supervisory power, and management power, 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, ensuring the efficient and compliant management 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.

During the reporting period, the Company had complied with all the code provisions except for code provision C.2.1 of the Corporate Governance Code contained in Appendix 14 to the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (the "Listing Rules"). Pursuant to code provision C.2.1, the role of chairman and the chief executive should be separate and should not be performed by the same individual. Mr. Zhao Ping, the President and executive Director of the Company, resigned as President, executive Director and from any other positions in the Company due to his age, effective from 26 September 2022. In order to fill the vacancy as soon as possible, the duties of the President of the Company were assumed by Mr. Zhao Keyu, the Chairman of the Company, effective from 26 September 2022. Although deviating from code provisions C.2.1 of the Listing Rules, Mr. Zhao Keyu provided solid and continuous leadership to the Group with his extensive experience and knowledge in management and the support of our management. Moreover, under the supervision of other existing members of the Board, the Board was appropriately structured with balance of power to provide sufficient checks to protect the interests of the Company and its shareholders. As such, the Board is of the view that the deviation from code provision C.2.1 of the Corporate Governance Code was appropriate in the circumstances. The Company will appoint a new President in Mr. Zhao Keyu's stead as soon as possible to comply with the requirement of code provision C.2.1.

In 2022, in accordance with the requirements under the Environmental, Social and Governance Reporting Guidelines of the Hong Kong Stock Exchange, 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 (www.hpi.com.cn: Investor Relationship-ESG Report) and the website of Hong Kong Stock Exchange (www.hkexnews.hk) together with the annual report as scheduled. If you wish to request a printed copy of the "2022 Environmental, Social and Governance Report" of the Company, you can contact the Company by sending email to zqb@hpi.com.cn.

(A) CORPORATE GOVERNANCE PRCTICES

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 both domestically and internationally, the Company is subject to the regulations of the security regulatory authorities of the different 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 has established and improved a corporate governance structure consisting of the shareholders' general meeting, the Board, the Supervisory Committee, and management team and built an operating mechanism with clear separation of powers and responsibilities, mutual checks and balances and coordinated operations between proprietorship, decision-making power, supervisory power, and management power, 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, ensuring the efficient and compliant management 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 has formulated a perfect information disclosure management system, a standardized financial management system, and a comprehensive risk management and internal control system. In order to ensure the authenticity, accuracy, completeness and timeliness of the Company's information disclosure, the Company has successively formulated and implemented relevant information disclosure systems, and revised the relevant systems in time according to the regulatory requirements. Based on a comprehensive and perfect institutional system, the Company has carried out information disclosure and investor relations with high quality. In 2022, the Company made a total of 284 information disclosures at home and abroad, and continued to achieve zero errors in information disclosure. The Company proactively strengthened communication and interaction with investors, actively carried out diversified investor relations activities, and established long-term and stable mutual trust relations with investors.

In order to strictly implement the laws and regulations on accounting, accounting standards and accounting systems, strengthen financial accounting and accounting supervision, and truly and fairly reflect the Company's financial status, operating results and cash flow, the Company has formulated a set of complete financial accounting and financial report preparation rules and regulations. In 2022, the Company revised and improved a number of rules and regulations, including the Financial Accounting Measures and the Cost Management Regulations, thus ensuring the quality of financial statements and the standardized operation of financial activities.

The Company attaches great importance to the corporate risk management and internal control. The Company has established and constantly improves an effective risk management and internal control system. The Company implements the basic risk management process in all aspects of management and operation process, establishes and improves a comprehensive risk management system, and designs and completes the Internal Control Manual by comprehensively sorting out the internal and external risks and the business processes, which comprehensively expounds the Company's principles and policies, clarifies the working procedures and post responsibilities of each position of the Company, and regulates the standard processes of handling the businesses of the Company, so as to realize the processed systems. The Company evaluates the effectiveness of the internal control system annually and regularly revises and improves the internal control system to realize the dynamic maintenance of the internal control system. At the same time, the internal control management department, the internal audit department and the external auditor report the internal control work of the Company to the Audit Committee under the Board of Directors on a regular basis, ensuring the continuous and effective operation of the internal control system. The Company successfully passed the audit on internal control by the external auditor for 17 consecutive years.

In 2022, the Company held 2 general meetings, 9 meetings of the Board of Directors and 4 meetings of the Supervisory Committee. The shareholders, Directors and Supervisors diligently performed their duties, consciously comply with the relevant national laws and regulations and the regulatory requirements of the jurisdictions in which the Company's shares are listed, attended the relevant meetings on time, carefully considered the topics of the meetings, and gave clear opinions and suggestions. The decisions on major topics for discussion were completed with high standards and high quality throughout the year, which guided the development of the Company in the next stage. The Strategy Committee under the Board of Directors held 2 meetings, and reviewed and approved the Development Plan during the "14th Five-Year Plan" and the Comprehensive Risk Management Report for 2022 of the Company. All the members carefully studied and scientifically demonstrated the relevant proposals, and actively expressed their opinions and suggestions, which provided a reliable guarantee for the Board of

Directors to formulate strategies and prevent risks. The Audit Committee under the Board holds eight meetings, communicates with the Company's legal advisers, the Company's external auditors, the Company's management and relevant functional departments on a regular basis to understand the update and implementation of applicable laws and regulations in the places where the Company is listed, the effectiveness and implementation of the Company's internal control, and the audit, and to make relevant comments and suggestions. The Remuneration and Appraisal Committee under the Board of Directors held regular meetings to listen to the report on the Company's total wages, and review the salary information that should be disclosed to ensure its truthfulness, completeness and accuracy. The convening and holding procedures, qualifications of conveners, qualifications of participants and voting procedures of the above meetings were in compliance with relevant laws and the Articles of Association of the Company. All proposals were successfully passed and the voting results were valid.

In 2022, the Company continued to be unanimously recognized by the regulatory authorities and the capital market, and won "the Most Valuable Listed Company with High Quality Development" and "the Most Valuable Listed Company for Investment" issued at the 12th China Securities Golden Bauhinia, and the "Excellent Board Award" of the 17th "Golden Roundtable Award" of the Board of Directors of China Listed Companies. The Company won the "A" grade rating for annual information disclosure granted by the Shanghai Stock Exchange and completed the preparation and disclosure of ESG reports with high quality for seven consecutive years. The Company was selected in the ESG Excellent Practice Case by the China Association for Public Companies and the ESG Best Practice Case of A-share listed companies in 2022 for two consecutive years. The service team of the Board of Directors of the Company won the honors of the 5A Rating of "Performance Assessment of the Secretary of the Board of Listed Companies in 2022" and "Best Practice of the Board of Listed Companies in 2022" awarded by China Association for Public Companies, respectively.

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.. The Company strived to maintain investor relations, responded to investor concerns in a timely manner, actively maintained the market image, and shared the achievements of development with all shareholders. In 2022, pursuant to the relevant regulatory regulations and requirements and according to the actual situation of the Company, the Company revised the Rules on Investor Relations Management accordingly to provide strong support for the Company to continue and efficiently carry out investor relationship management. 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.

(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 2022, 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, strengthen financial accounting and accounting supervision, and truthfully and fairly reflect the financial position, operating results and cash flow, the Company has formulated a set of complete accounting and financial reports preparation rules and regulations and made amendments and improvements on a regular basis. In 2022, the Company revised the Measures on Accounting, the Administrative Measures for Financial Write-off of Asset Losses, Regulations on Management of the Asset Impairment Test, Regulations on Management of Joint Examination of Final Accounts and the Provisions on Cost Management, etc.. 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 truthfulness, authenticity and completeness of the financial reports.

2. In regard to fund management, the Company has formulated a number of management measures including the Measures on Financial Management, the Measures on Capital 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 Financial Derivative Business, the Administrative Measures on Financing 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 has established a system of risk monitoring and internal control, and has been keeping 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 2022, 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 2022, 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. In the sixth edition of the Internal Control Handbook, the Company 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 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. The three-level of quality supervision has been established at the company, regional branches and the grassroots units, which are three levels of the Company, through the internal control management system to track the implementation of control in real time. For the internal control evaluators, the Company implements the system of "holding positions with certificates", and takes the online training and passing of examinations as a necessary condition for reviewing the qualifications of internal control evaluators, effectively promoting the improvement of the professional quality of internal control personnel. During the year, the Company has successfully completed the 12-month routine internal control assessments, and conducted a comprehensive spot check on the filling quality of the internal control evaluation working papers of all subordinate units of the Company, and the results of the spot check were reported in time and included in the annual internal control target assessment, 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. The Company has continuously improved the internal control assessment system and formulated the Internal Control Objective Assessment Management Measures. The Company conducts internal control target assessment every year, and the assessment results are fulfilled in a timely manner, which effectively guides units at all levels to pay attention to the quality of internal control work, and earnestly realize the in-depth goal of promoting management through internal control.

Based on a comprehensive assessment, the Board of Directors consider that, as of 31 December 2022, 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 supporting guidance as well as other regulatory requirements on internal control, and the Company has not found any material defect in non-financial reporting about internal control.

(B) SECURITIES TRANSACTIONS BY DIRECTORS

As a dual-listed A+H share company, the Company has strictly complied with the relevant binding provisions on securities transactions by directors imposed by the regulatory authorities of Hong Kong and The Chinese Mainland and we insist on the principle of complying with the strictest provision, which is, implementing the strictest provision among the places of listing. 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 of the Listing Rules as the model code for securities dealings by Directors of the Company, based on which, the Company 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., which required the transfer of the Company's shares be strictly in accordance with the stipulations under 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) SHAREHOLDERS' GENERAL MEETING

Over the years, apart from committing itself to the operation and expansion of its businesses in order to attain appropriate returns for shareholders, the Company also provides details on the Company's operations management and relevant information to shareholders in a timely and accurate manner through a variety of channels and methods, including: convening and holding general meetings in strict compliance with the Articles of Association, the Listing Rules and relevant regulations stipulated by the Securities and Futures Commission (the "SFC") in Hong Kong, and timely announcing relevant information to shareholders on an irregular basis according to the requirements of the Listing Rules.

During the year 2022, the Company held a total of two general meetings, considering and approving 13 ordinary resolutions and 3 special resolutions, and a professional lawyer was invited to each general meeting as a witness to ensure all shareholders were treated equally and exercised their rights adequately. In 2022, the matters considered at the general meetings of the Company mainly included work reports of the Board (Supervisory Committee) of the Company for the year 2021, final financial report, and appointment of the auditor for the year, etc.

For details about the resolutions passed at general meetings for the year 2022, please refer to the announcements on such resolutions published by the Company on the website of the Hong Kong Stock Exchange.

For the year 2022, the Company placed particular emphasis on shareholders' relations, maintaining communication with shareholders through various channels to facilitate mutual understanding between the Company and its shareholders. In particular, the

Company has established a division and assigned designated staff to receive visitors, making its contact numbers publicly available and to answer telephone enquiries at any time. In addition, the Company's website was set up to present the latest updates and past results of the Company as well as the management body of the Company, so as to facilitate shareholders' and investors' comprehensive understanding of the Company.

For details about the Company's communication with shareholders and investors for the year 2022, please refer to the "Investor Relations" section of this annual report.

In order to safeguard the legitimate interests of the Company and its shareholders, to specify the duties, responsibilities and permission right of the shareholders' general meetings, to ensure the proper, efficient and smooth operation of the shareholders' general meeting and to ensure the shareholders' general meeting exercises its functions and powers according to law, the Company formulated the Rules of Procedures for the General Meetings of Huaneng Power International, Inc., such Rules apply to the general meetings of the Company and shall be binding on the Company, all shareholders, authorised proxies of the shareholders, directors, supervisors and other relevant personnel present at the meeting.

- Proposals at the general meeting shall be usually put forward by the board of directors. Where more than one-half of the independent directors request the Board of Directors to convene an extraordinary general meeting, they shall be responsible for putting forward the proposals to be examined at the meeting. The shareholders individually or jointly holding more than 3% (including 3%) of the total shares with voting rights of the Company are entitled to put forward provisional proposals at the general meeting in accordance with the relevant procedure specified in the applicable laws. Where the Supervisory Committee proposes to convene an extraordinary general meeting, it shall be responsible for putting forward proposals. Where shareholders individually or jointly holding more than 10% (including 10%) of the Company's shares with voting rights propose to convene an extraordinary general meeting, the proposing shareholders shall be responsible for putting forward the proposals.

- Shareholders individually or jointly holding more than 3% (including 3%) of the Company's shares with voting rights are entitled to put forward proposals at the general meeting. The Board of Directors shall examine and approve such shareholders' proposals according to the following principles:

  (1) Relevance. The Board of Directors shall conduct examination of a proposal. If the proposal is directly relevant to the Company and falls into the jurisdiction of general meeting as required by laws, regulations and the Articles of Association, it shall be submitted to the general meeting for discussion. Otherwise no such submission shall be submitted to general meeting.

  (2) Procedures. The Board of Directors may decide on the procedural issues relating to the proposal. Where a proposal needs to be divided into different proposals or merged with other proposals to be voted on, consent of the person putting forward the original proposal is required. If the person putting forward the original proposal does not agree with any changes, the chairman of the general meeting may request the general meeting to decide on the procedural issues and conduct discussion according to the procedures decided by the general meeting.

- Where the shareholders individually or jointly holding more than 10% (including 10%) of the

Company's shares with voting rights propose to convene an extraordinary general meeting or class shareholders' meeting, they may sign one or more written request(s) in identical form and contents to propose to the Board of Directors to convene an extraordinary general meeting or class shareholders' meeting and specify the topics for discussion at the meeting, and submit proposals complying with the requirements of The Rules of Procedure for the General Meeting of Huaneng Power International Co., Ltd. to the Board of Directors at the same time.

- The proposals put forward at the general meeting shall meet the following conditions:

  (1) The content of the proposals shall be in compliance with requirements stipulated by laws, regulations and the Articles of Association and shall fall within the business scope of the Company and within the jurisdiction of general meeting;

  (2) The theme of the proposal shall be clear and specific;

  (3) The proposal shall be submitted to the Board of Directors in writing.

- For any questions concerning the general meeting, please contact:

  Address: Capital Market Department
  Huaneng Power International, Inc.
  Huaneng Building,
  6 Fuxingmennei Street,
  Xicheng District, Beijing 100031,
  The People's Republic of China
  Contact: Hu Boxuan
  Email: huboxuan@hpi.com.cn

(D) 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 (who ceased to be a Director of the Tenth Session of the Board of the Company, the President and members of other Board Committee due to his age and formally resigned on 26 September 2022) 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 of Directors.

During the reporting period, the Board of Directors of the Company held nine 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	9	9	0	100%
Non-executive Directors	9	9	0	100%
Huang Jian	9	9	0	100%
Wang Kui	9	9	0	100%
Lu Fei	9	9	0	100%
Teng Yu	9	9	0	100%
Mi Dabin	9	9	0	100%
Li Haifeng	9	9	0	100%
Cheng Heng	9	9	0	100%
Lin Chong	9	9	0	100%
Independent Non-executive Directors				
Xu Mengzhou	9	9	0	100%
Liu Jizhen	9	9	0	100%
Xu Hiafeng	9	9	0	100%
Zhang Xianzhi	9	9	0	100%
Xia Qing	9	9	0	100%
Resigned Director				
Zhao Ping	5	5	0	100%

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 2022 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 meeting such as the Chairman 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 2021 Annual General Meeting of the Company held on 28 June 2022 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), Wang Kui (Director), Lu Fei (Director), Xu Mengzhou (independent Director, chief member of the Remuneration and Appraisal Committee of the Tenth Session of the Board of Directors), 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 2022 First Extraordinary General Meeting of the Company on 30 December 2022 were Zhao Keyu (Chairman, chief member of the Strategy Committee of the Tenth Session of the Board of Directors), Teng Yu (Director), Li Haifeng (Director), Xu Haifeng (independent Director), Zhang Xianzhi (independent Director, chief member of the Audit Committee of the Tenth Session of the Board of Directors) and Xia Qing (independent Director).

(E) 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 acted as the Chairman of the Company and Mr. Zhao Ping acted as the Director and the President of the Company during the Reporting Period. Mr. Zhao Ping resigned on 26 September 2022. Mr. Zhao Keyu, the Chairman of the Company, shall act as the President until a new President is appointed.

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

(F) 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:

Name of non-executive Directors	Term of office
Huang Jian	2008.8.27-2023
Wang Kui	2020.6.16-2023
Lu Fei	2020.6.16-2023
Teng Yu	2020.6.16-2023
Mi Dabin	2014.9.18-2023
Li Haifeng	2020.12.22-2023
Cheng Heng	2017.6.13-2023
Lin Chong	2017.6.13-2023

(G) 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 Remuneration and Appraisal 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 (resigned), 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 Appraisal Committee. The first meeting for 2022 was convened on 21 March 2022, at which the Report of Total Payroll of the Company was heard and the Company's arrangement for the total payroll for 2022 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
2022 First Meeting of the Remuneration and Appraisal Committee of the Tenth Session of the Board of Directors	2022.3.21	Xu Mengzhou, Zhao Ping, Cheng Heng, Li Haifeng, Liu Jizhen, Zhang Xianzhi, Xu Haifeng	/

(H) 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 Nomination 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 (Chief Member), 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.

During the reporting period, the Nomination Committee of the Company did not hold meetings. The Tenth Session of the Board of Directors will expire in 2023, and the Company is carrying out the relevant replacement work as planned, actively seeking director candidates, including female director candidates, who meet the needs of the Company's operation and business operation through various means, such as selection from the relevant databases of industry associations, and striving to build a Board of Directors that balances high-quality development and diversity requirements.

(I) AUDITORS' REMUNERATION

For the years of 2019, 2020, 2021 and 2022, 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 year ended 31 December 2022 were RMB29.39 million, RMB1.53 million, RMB0.65 million and RMB0.60 million, respectively.

(J) 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 (including the quarterly results, interim results and annual results), 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
2022 First Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.2.25	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2022 Second Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.3.21	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2022 Third Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.4.25	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2022 Fourth Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.7.25	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2022 Fifth Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.9.13	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2022 Sixth Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.9.28	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2022 Seventh Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.10.10	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/
2022 Eighth Meeting of the Audit Committee of the Tenth Session of the Board of Directors	2022.11.1	Zhang Xianzhi, Xu Mengzhou, Liu Jizhen, Xu Haifeng, Xia Qing	/

(K) 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.

(L) SENIOR MANAGEMENT'S INTEREST IN SHARES

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

(M) 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 (resigned), 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.

In 2022, the Strategy Committee of the Company held two meetings to consider and approve the *14th Five-Year Plan* and *2022 Annual Comprehensive Risk Management Report*. All members of the committee studied the reports prudently and scientifically, and actively expressed their opinions and suggestions to improve the reports, which played an important role in improving the quality and efficiency of decision-making.

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
2022 First Meeting of the Strategy Committee of the Tenth Session of the Board of Directors	2022.3.21	Zhao Keyu, Zhao Ping, Huang Jian, Wang Kui, Lu Fei, Liu Jizhen, Xu Haifeng	/
2022 Second Meeting of the Strategy Committee of the Tenth Session of the Board of Directors	2022.8.29	Zhao Keyu, Zhao Ping, Huang Jian, Wang Kui, Lu Fei, Liu Jizhen, Xu Haifeng	/

(N) TRAININGS FOR DIRECTORS AND SENIOR MANAGEMENT

In 2022, the Directors, Supervisors and senior management of the Company attached great importance to strengthening their awareness of compliance and enhancing their ability to perform their duties, actively participated in various special trainings held by regulatory bodies and industry associations, and kept abreast of the updates of regulations and relevant policies in listed places. Throughout the year, the Directors, Supervisors and senior management of the Company attended the important meetings such as annual and interim supervisory meeting and bond and asset securitization business supervision conference of CSRC Beijing Bureau, training conference on corporate governance of China Association for Public Companies, to continuously and thoroughly study the cases of illegal and unlawful investigation and punishment, and the cases of anti-corruption and anti-fraud. All the Directors, Supervisors and senior management of the Company consciously abide by the laws, regulations and Articles of Association of the Company, and take the lead in "knowing the fear and keeping the bottom line" to provide a guarantee for the continuous improvement of corporate governance.

The Company organizes communication activities between the Company's legal advisor and the Audit Committee to introduce and report to all members of the Audit Committee every six months to introduce and report to all members of the Audit Committee of the Company on the update of the regulatory regulations of the listed places, the application of the relevant systems of the Company and the Company's compliance with the regulations of the listed places.

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 2022 to 31 December 2022:

Name of Director/Supervisor	Type of continuing profssional development plan
Zhao Keyu	A、B
Huang Jian	A、B
Wang Kui	A、B
Lu Fei	A、B
Teng Yu	A、B
Mi Dabin	A、B
Cheng Heng	A、B
Li Haifeng	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
Xia Aidong	A、B
Gu Jianguo	A、B
Xu Jianping	A、B
Zhu Tong	A、B
Name of former Director/Supervisor	A、B
Zhao ping	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.

(O) TO CONVENE EXTRAORDINARY BOARD MEETINGS

An extraordinary Board meeting may be held at the request of any shareholder 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 a meeting.

(P) 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.

(Q) INSURANCE FOR DIRECTORS

The Company has renewed its Directors' Liability Insurance policy of US$10 million in 2022.

In order to further adapt to the development needs of the Company and continuously optimize the structure of Directors' Liability Insurance, the Company adjusted such plan which has been deliberated and approved by the general meeting of shareholders.

(R) COMPANY SECRETARY

Mr. Huang Chaoquan has been acting as the Company Secretary of the Company under the 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 Listing Rules.

(S) EMPLOYEES DIVERSITY

The Company adheres to the two principles of legal employment and equal opportunity employment. All-rounded diathesis shall be considered in recruitment and candidates of diverse genders, nationalities, ethnics, religious beliefs and cultural backgrounds shall be provided with equal opportunities and labor protection. The Company shall uphold the principal of equal pay for equal work with no discrimination against either sex and eradicates forced labor and employment discrimination, and make sure that the equal employment policy run through the recruitment process for every employee.

The ratio of male to female employees of the company is close to 4:1, in line with the employment characteristics of the power industry.

(T) MAJOR CHANGES IN THE ARTICLES OF ASSOCIATION

No major changes were made to the Articles of Association of the Company during the reporting period.

(U) SHAREHOLDERS' COMMUNICATION POLICY

During the reporting period, the Board has reviewed the implementation and effectiveness of the Shareholders' communication policy and considers the Company's communication policy effective, as detailed in the section on "Shareholders' General Meetings" of the Corporate Governance Report and in "Investor Relations" of this report.

(V) DESCRIPTION OF THE COMPANY'S SIGNIFICANT RLATIONSHIPS WITH ITS EMPLOYEES, CUSTOMERS AND SUPPLIEERS

The Company considers its employees to be a valuable asset. The Company focuses on the career development of employees, optimizes talent allocation and development environment, provides multiple career development channels, continuously optimizes the selection process and assessment mechanism for technical skills positions, provides a platform for employees to unleash the talents. At the same time, the Company provides the employees with continuous training and development opportunities to achieve their career development. In addition, the Company believes that maintaining good relationships with its business partners and financial institutions is essential to achieving the Company's long-term objectives. During the reporting period, there were no significant disputes between the Company and its business partners and financial institutions.

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 2022 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 2022.

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, operate and manage coal-fired power plants and renewable energy power plants by making use of modern technology and equipment and financial resources available domestically and internationally, and provide comprehensive energy services, and the Company is one of the largest listed power companies in China.

The Company is committed to be a world first-class listed power company, always adheres 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 2022, the Company had a controlled generation capacity of 127,228 MW. The Company has power plants located in 26 provinces, autonomous regions and municipalities, wholly owns a power company in Singapore and invests in a power company in Pakistan.

2. Corporate Governance

Under the leadership of the Communist Party of China, and guided by Xi Jinping Thoughts on Socialism with Chinese Characteristics for a New Era, the Company thoroughly studied and propagandized the spirit of the 20th National Congress of the Communist Party of China, continuously deepened theoretical practice, emphasized to promote the Party building and guidance, comprehensively implemented the fine Party culture and incorrupt construction of the Communist Party, fully relied on the workforce, and led high-quality development with high-quality Party building.

As a listed company, the Company was subject to regulations of security regulatory authorities and supervision from its investors, strictly complied with requirements of laws and regulations, vigorously fulfill corporate social responsibility, and constantly improve and promote the modern corporate governance system and governance level of the Company. The Company has 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, mutual checks and balances and coordinated operations between proprietorship, decision-making power, supervisory power, and management power, 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, ensuring the smooth implementation of the operation and management of the management team.

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 to achieve dynamic maintenance of the system.

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 2022, the Company received "the Most Valuable Listed Company with High Quality Development" and "the Most Valuable Listed Company for Investment" of the 12th China Securities Golden Bauhinia. The Company ranked 62nd on Fortune China 500 list. The Company's A shares were included in both the A150 and A200 flagship indexes of FTSE China. The Company maintained error-free information disclosure throughout the year and received an A grade rating from the SSE. The Company has issued high-quality sustainable development reports for 13 consecutive years, and continuously enhanced communications and exchange with stakeholders. The Company's ESG reports have been included in the list of best practices cases, and ranked high in rating. We are invited to share our practical experiences.

II. OPERATION RESPONSIBILITY OF THE COMPANY

The Company has endeavored to produce more products that meet the needs of the society and the people, and devote ourselves to creating greater value for our shareholders. In the face of the high coal prices and other multiple challenges, we have taken the initiative to cope with difficulties, gone all out to ensure energy supply and take multiple measures to improve quality and efficiency, and made positive contributions to enhancing national economic strength through professional, lean and efficient management.

The Company has demonstrated its corporate responsibility with energy supply. Having firmly established the people-centered development thought, and resolutely shouldering the political responsibility for ensuring the safe supply of energy and power, the Company has ensured the energy supply on the basis of "guaranteeing people's livelihood, power generation and heat supply" and spared no efforts to ensure the safe and stable supply of power and heat. We have overcome the difficulties of the frequent extreme weather such as high temperature, rainstorm and typhoon, and the unfavorable conditions such as high coal and gas prices, and successfully accomplished the task of safe and stable supply of electricity and heating power for the 20th CPC National Congress, the Beijing 2022 Olympic and Paralympic Winter Games and other important periods. The Company has achieved a total of 451.1 billion KWh of power generation and 320 million GJ of heat supply in its domestic power plants throughout the year, effectively ensuring the demand for energy for people's livelihood and economic and social development.

The Company has been seeking progress in steady growth through lean management. Faced with the unfavorable situation that the domestic coal supply is tight, the imported coal is reduced substantially, and the coal price remains at a high level, the Company has strengthened its power market research, increased the synergy of marketing, production and fuel procurement, and striven to generate more efficient power, giving priority to securing power generation from clean energy units such as wind power, PV power and hydro-power generation. Power marketing has been strengthened with 16% year-on-year increase in revenue from domestic power sales, 18% year-on-year increase in integrated settlement tariff and 20.7% increase in average price of coal power transactions. By continuously increasing efforts to explore the heat market and actively promoting heat price increase, the Company has striven to improve heat supply yields and achieved year-on-year growth in heat sales, price and revenue for the year.

The Company has been reducing costs and expenses in a strict and efficient manner. The Company has continued to strengthen coal price control, made efforts to promote the implementation of the relevant national requirements on coal market price management, optimized and adjusted its procurement strategy, and strictly controlled the purchase of high-priced spot coal. Through the aforementioned initiatives, the Company has effectively reduced its fuel costs. Giving full play to the role of capital market financing, the Company made full use of national support policies and green financial policies. The Company seeked support from various policies such as carbon emission reduction support instruments, special refinancing loans for clean and efficient utilization of coal and policy-based development financial instruments, and issued the first batch of transformation bonds in China. This helps the Company's green and low-carbon transformation while ensuring the security of energy supply and reducing capital costs. The Company has issued special bonds for energy supply assurance at a State Council executive meeting to provide financial support to coal and electricity enterprises for supply assurance. The Company has been actively recovering renewable energy subsidies and retained tax credits to effectively supplement the Company's operating cash flow. The Company's consolidated cost of funds has gradually decreased throughout the year, with annualized financial expenses savings of nearly RMB600 million.

The Company has made new achievements in overseas projects. Tuas Power focused on advancing the implementation of the measures of "stabilizing operation, preventing risks and promoting development", and achieved the best operating performance in history. Its full-year power generation capacity increased 17.83% year-on-year and operating revenue increased 74.11% year-on-year. It achieved a profit of RMB1.878 billion and made its first dividend of RMB1.25 billion to the Company. It obtained unsecured independent financing of approximately RMB4 billion, and continued to optimize its financing structure and reduce financing costs. Jurong Island desalination project has been commissioned at full capacity to help Singapore achieve sustainable development of water resources. Neste expansion project has been delivered with good economic benefits. The management level of Sahiwal project in Pakistan has continued to improve, achieving a continuous safety production of over 2000 days and maintaining stable operating efficiency. The project won four corporate social responsibility awards including "Sustainable Development", "National Fire Safety Award", "Environmental Excellence Award of the Year" and "Reliable Power Station Award 2021" from Pakistan's National Power Grid.

III. SAFETY RESPONSIBILITY OF THE COMPANY

The Company has always prioritized safety development, adhered to the safety concept that "safety is credibility, safety is efficiency, safety is competitiveness, and safety responsibility is of the utmost importance", constantly improved safety production governance system, fully strengthened the foundation for safety production, and made every effort to ensure safe and stable power supply to the society and the power grid.

The Company consolidated and strengthened safety foundation. Focusing on strengthening the implementation of safety production responsibilities and ensuring the separation of authority and responsibility, the Company has firmly established the first "firewall" for safety production. The Company has solidly promoted the action of the year of safety production improvement, consolidated the results of the three-year action of special rectification of safety production, and fully implemented a dual prevention mechanism of risk grading and control and hidden danger investigation and management. We have successfully dealt with extreme weather and natural disasters, and achieved safe production and operation through summer and flood. The Company build an infrastructure safety responsibility system of "safety risk grading and control, hidden danger investigation and management, and safety production standardization", 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 injury and death and zero accident in infrastructure field.

The Company continued to strengthen the safety of equipments. 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.

IV. ENVIRONMENT RESPONSIBILITY OF THE COMPANY

The Company consistently implemented the new development concept, thoroughly implemented the new energy safety strategy of "Four Revolutions, One Cooperation", centered on the carbon peak and carbon neutral targets, faithfully implemented the general idea of building a new power system with new energy as the subjects, optimized the 14th Five-Year Plan, and carried out the carbon peak action plan, so as to contribute the Company's strength to the harmonious development of human and nature.

The Company has continued to optimize its thermal power development. The Company has built high-efficiency and flexible coal power projects with high standards. Dongjiakou Cogeneration, Dalian Second Heat Project and the first set of units of Yangpu Combustion Engine have been put into operation one after another, providing strong support to ensure stable regional energy supply. The Company has been solidly promoting the "energy-saving and consumption-reducing renovation, heat supply renovation and flexibility renovation" of coal-fired power units, focusing on the integrated and precise implementation of measures. Through these measures, the Company has added 22.89 million square meters of heating area and 1,280 MW of flexibility capacity, achieving clean, efficient, flexible and low-carbon high-quality development. Relying on "one station and one center", the Company has established a full element, full participation and whole process power construction quality control system, and achieved the first standard certification for thermal power construction of central government-owned enterprises. The management innovation achievement of "Building a new model of engineering and construction management of new generation coal-fired smart power plants" won the 2022 Power Innovation Award of China Electricity Council.

The Company has been deeply promoting the development of new energy sources. The Company accelerated the reserve and development of "zero carbon emission" power generation projects and steadily increased the installed capacity of new energy. The Company completed the approval (filing) of 36,980 MW of new energy projects for the year, hitting a new high record. The Company started the construction of new energy installed capacity of 9,210 MW and put 6,030 MW into grid-connected operation, and the proportion of new energy installed capacity increased by 4 percentage points year-on-year. The scale of offshore wind power in operation in Liaoning, Shandong, Jiangsu and Zhejiang reached 3,360 MW. Hunan Jiangkou Wind Power Project has been connected to the grid at full capacity, effectively promoting local energy structure adjustment and sustainable economic and social development. As a base type new energy project of cross-provincial development, Jilin Daan "Power from Jilin to Shandong" wind power project has been successfully connected to the grid. This is of great significance to guarantee the power supply of Shandong Province, optimize the energy structure and achieve the goal of "carbon neutrality and carbon emission peaking". The first batch of square matrix of Guangzhou Huadu Chini fishery PV complementary project has been successfully connected to the grid, becoming the first "carbon neutrality" new countryside fishery PV complementary integrated demonstration project in a first-tier city in China. Through the model of "fishery PV and tourism integration", the project realizes multi-win situation in terms of environmental, social and economic benefits, and provides Huaneng's sample for the integrated development of rural revitalization and "carbon neutrality and carbon emission peaking".

The Company has been strongly implementing energy saving and consumption reduction. The Company has been constantly improving the three-level energy-saving management system, strengthening the target management of energy consumption indicators, and carrying out benchmarking management of the same type of unit models. It has been attaching importance to the research and application of new energy-saving technologies and continuously improving the level of energy-efficiency. In 2022, the coal consumption of the Company's thermal power units was 287.69g/KWh, and the auxiliary power consumption rate was 4.37%, maintaining its industry-overall leading performance in major energy consumption indicators.

The Company has been vigorously promoting technological innovation. Focusing on the national strategic needs, the Company has been continuously strengthening the key core technology research and accelerating the realization of scientific and technological self-reliance and self-improvement. The "liquid slag boiler all-fired high alkali coal technology" was identified as an international leading achievement, and the Beijing Thermal Power Plant completed the conversion of liquid slag to high added value and realized good economic benefits. The Company has completed the main R&D tasks of 700°C high temperature materials and combustion engine autonomy projects, and made more than ten technical breakthroughs. The Company's digital intelligence construction took new steps: The power network security range was rated as a national range, the first virtual power plant with direct grid dispatch was completed and put into operation, and smart power plant systems of the Ruijin Power Plant Phase II Project and Shidongkou I Power Plant were running smoothly. In 2022, the Company obtained 264 invention patents, 4,357 utility model patents and 113 international patents, all of which achieved significant year-on-year growth.

The Company has been continuously strengthening emission management. The Company has been actively strengthening the management of safe and stable operation of unit environmental protection facilities, striving to implement ecological and environmental protection risk control, and strictly controlling the emission of pollutants to meet the standards. The Company has been conscientiously implementing various air quality protection measures during major events and heavy pollution weather to ensure air quality protection during key hours, showing the green image of Huaneng. In 2022, the emission performance of the Company's thermal power units for sulfur dioxide, nitrogen oxides and soot was 64mg/KWh, 133mg/KWh and 8.4mg/KWh, respectively, and the overall pollutant emission concentration remained stable at the ultra-low emission level. The Company completed the ultra-low emission transformation of Unit 4 of Diandong Power Plant, achieving full coverage of ultra-low emission of the Company's coal machines. In terms of greenhouse gas emission management, the Company has firmly established the awareness that "carbon emission results in costs and carbon reduction brings benefits", and made solid efforts to measure and verify greenhouse gas emission data. It has also actively carried out intra- and inter-regional quota trading. The above management measures have effectively reduced the overall carbon compliance cost of the Company.

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, 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. The Company carried out various public welfare activities to help the people achieve a better life. In 2022, the Company was awarded the title of "Top 500 Chinese Enterprises in Philanthropy in 2022".

Guided by Xi Jinping thought on socialism with Chinese characteristics for a new era, the Company has been earnestly carrying out the decision and arrangement of the CPC Central Committee and the State Council on consolidating and expanding the achievements in poverty alleviation and effectively connecting the efforts of rural revitalization, and improving and optimizing support measures, implementing support projects in a precise manner, which effectively promotes the implementation of the rural revitalization strategy of the state. The Company has been playing the advantages of its main business, investing in the construction of PV assisting projects according to local conditions, improving rural energy conditions and increasing collective stable income. The Company has been increasing its efforts to support the cultivation of special industries and fund the construction of public infrastructure, effectively improving the production and living conditions of the assisted people and promoting the construction of beautiful villages, with the total investment in the assistance fund totaling RMB12,982,000 during the year. The Company has been vigorously implementing consumer assistance to continuously improve the income level of the assisted people. Throughout the year, we have purchased and helped sell approximately RMB45 million of agricultural products for the targeted assisted areas, energy industry cooperation areas and key national assisted areas. The Company has been carrying out the project of helping students, the project of rescuing urgent difficulties and the project of blessing to develop agriculture. It has been promoting the goal of modernizing the development of agriculture, the ecological livability of the countryside and the common prosperity of the farmers in the assisted areas from various aspects such as talent cultivation, medical protection, industrial development and grass-roots party building.

The Company has set up a volunteer service platform and carried out "Three-color Sail" brand public welfare activities, contributing love and warmth in many fields such as education, medical care and environmental protection. The Company's overseas subsidiaries have been practicing the concept of social responsibility and participated in several local public welfare projects, reflecting the principle of mutual discussion, co-construction and sharing. For many years, Tuas Power in Singapore has devoted to the development of local public welfare projects such as child welfare support and food welfare improvement, winning wide acclaim from the society. Huaneng Shandong Ruyi (Pakistan) Energy (Private) Co., Ltd. donated PKR6.12 million (approximately RMB200,000) to the "2022 Prime Minister's Disaster Relief Fund" to help the recovery and reconstruction of areas affected by the 100-year level floods in Pakistan. The Company's Chinese and Pakistani employees also donated over PKR1.06 million (approximately RMB35,000) to provide relief to the affected people. This fully embodies the traditional friendship between China and Pakistan to help each other and overcome the difficulties together, and establishes a good image of Huaneng in Pakistan.

The Company has been remaining true to our original aspiration to succeed. The Company will continue to actively fulfill social responsibility, adhere to the "people-oriented", and uphold the high-quality sustainable development concept. We will accelerate the green low-carbon transformation, fully contribute to rural revitalization, and join hands with stakeholders to create a better future.

INVESTOR RELATIONS

PHILOSOPHY OF INVESTOR RELATIONS

Huaneng Power 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 2022, the Company revised the "Rules on Investor Relations Management". The revised "Rules on Investor Relations Management" will serve as a fundamental working guide for the Company's investor relationship management which will help improve our effort in such aspect and an institutional mechanism that facilitates communication with and protects legal rights and benefits of investors.

In addition, the Company has also formulated the "Internal Control System" as well as the "Internal Control Handbook" according to the relevant requirements of the State and Sections 302 and 404 of the "Sarbanes-Oxley Act of 2002", and further enhanced our corporate governance and ensured 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.

Broaden 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 6 overseas press releases and issued 278 announcements within and outside China in 2022.

NOTE TO SHAREHOLDERS

As the Company recorded a net loss attributable to shareholders of the Company in 2022 and take in account our potential investment needs for transformation and development of the Company as well as the increase in the gearing ratio of the Company in 2022, it is proposed that no dividend be paid for the year 2022 in accordance with the Company's Articles of Association. The proposal has been considered and approved by the Board and the Supervisory Committee and will be submitted to the annual general meeting of the Company for consideration.

INVESTOR RELATIONS ACTIVITIES

Results Conference

In 2022, the Company uses teleconference to organized and convened a conference call for global investors with the theme on its 2021 annual results and 2022 first quarterly results, 2022 interim results and 2022 third quarterly results, and organized an online third quarterly results presentation for medium and minority investors through SSE Roadshow platform of Shanghai Stock Exchange.

Investment forums and investor meetings

In 2022, the Company actively participated in investment forums and investor exchange activities held online by domestic and overseas institutions and totally engaged in more than 40 online meetings with institution investors.

Visits by and general enquiries from investors

The Company carried out daily investor relations maintenance in an orderly manner. The Company received more than 300 investor visits from investors and telephone inquiries. The Company paid attention to the SSE E-interactive platform in real time, timely replied to 106 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 present the annual report together with the audited financial statements for the year ended 31 December 2022.

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 2022.

For the twelve months ended 31 December 2022, the Company and its subsidiaries realized consolidated operating revenue of RMB246,725 million, representing an increase of 20.31% compared to the same period last year, and net loss attributable to equity holders of the Company amounted to RMB8,026 million, representing a decrease of loss of 22.66% as compared with the same period last year. Losses per share amounted to RMB0.65. The Board is satisfied with the results of the Company in the past year.

The Board proposed that no dividend be paid on ordinary shares of the Company.

BUSINESS REVIEW OF YEAR 2022

In 2022, facing the severe challenges of tight supply of energy and high price of coal, the Company actively responded to market changes, vigorously promoted business reform and development, and achieved good results in power production, quality improvement and efficiency improvement, green development and overseas business, marking a new stage in high-quality development of the Company.

1. Operating Results

For the twelve months ended 31 December 2022, the Company and its subsidiaries realized operating revenue of RMB246.725 billion, representing an increase of 20.31% as compared with the same period last year. Net loss attributable to equity holders of the Company amounted to RMB8,026 million, representing a decrease of loss of 22.66% as compared with the same period last year. Losses per share amounted to RMB0.65.

As at the end of 2022, net assets per share of the Company amounted to RMB3.41, representing a decrease of 17.43% as compared with the same period last year.

The Audit Committee of the Company convened a meeting on 20 March 2023 and reviewed the 2022 annual results of the Company.

2. Power Generation

In 2022, 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, 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 strove to increase effective power generation. The Company's total on-grid power generated by the domestic operating power plants on a consolidated basis amounted to 425.186 billion kWh, representing a year-on-year decrease of 1.44%. The annual average utilization hours of the Company's domestic power plants were 3,785 hours, representing a year-on-year decrease of 273 hours. In particular, the utilization hours of coal-fired power generating units were 4,228 hours, representing a year-on-year decrease of 260 hours. Total heat supplied by the Company amounted to 322 million GJ, representing a year-on-year increase of 8.3%.

3. Cost Control

In 2022, the Company procured an aggregate of 194 million tons of coal. Affected by the tight supply of energy markets at home and abroad, the coal price remained at a high level. The Company proactively facilitated the entering into and performance of medium and long-term thermal coal contracts and emergency guarantee contracts for imported coal, continuously optimized the structure of domestic and foreign supply, actively responded to unfavorable market conditions such as price inversion of imported coal, shortage of coal resources and high price of coal, and effectively guaranteed the supply of electric power and heat power for peak seasons including summer and winter and other on-peak hours. However, due to the sharp increase in the coal price, the Company's fuel cost per unit of power sold by domestic coal-fired power plants increased to RMB372.56 per MWh, representing a year-on-year increase of 17.73%.

4. Energy Saving and Environmental Protection

In 2022, the average equivalent availability ratio of the domestic thermal generating units of the Company was 93.37%, coal consumption of power supply was 287.69g/kWh and the house consumption rate of plants was 4.37%. Main energy consumption indicators such as coal consumption of power supply maintained a leading position in the whole power industry. With respect to air pollution emissions, all thermal power units of the Company have met the ultra-low-emissions standard. 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

The Company overcame a variety of adverse factors such as rise in price of PV modules, extreme weather, labor shortage and lagged supply of materials and equipment, and promoted the construction of power generation projects in an orderly manner. During the year, the Company added grid-connected power generating infrastructures with a controlled generation capacity amounting to 8,614 MW, among which the installed capacity for power generated from low carbon clean energy reached 6,564 MW. As of 31 December 2022, the Company's controlled generation installed capacity was 127,228 MW and low carbon clean energy installed capacity accounted for 26.07%.

6. Overseas Business

Tuas Power, a wholly-owned subsidiary of the Company in Singapore, maintained safe and stable operation of the generation units throughout the year. Through dynamical optimization of the market strategy, the Company actively expanded the electricity retail market to constantly increase the marginal contribution of electricity sales per unit. The total market share of Tuas Power in the power generation for the whole year was 22.3%, representing a year-on-year increase of 3.1 percentage points. The power generation of Tuas Power Project in Singapore (merger of SinoSing Power and Tuas Power) amounted to 12.354 billion kWh, representing a year-on-year increase of 1.860 billion kWh; the revenue was RMB28.443 billion, representing a year-on-year increase of RMB12.107 billion; the pre-tax profit was RMB1.878 billion, representing a year-on-year increase of RMB1.714 billion.

Sahiwal coal-fired power plant continues to make positive contributions to the power supply in Pakistan. In 2022, the pre-tax profit of projects in Pakistan was RMB597 million, representing a decrease of RMB180 million as compared with the same period last year.

PROSPECTS FOR 2023

In 2023, the Company will adhere to the general keynote of seeking progress in a stable manner, implement the new development concept completely, accurately and comprehensively, help build a new development pattern, focus on the Company's "14th Five-Year Plan" and the Company's development strategy, firmly resolve to green and low-carbon development, vigorously promote the company's transformation and development, fully complete the annual targets and tasks, and strive to create a new situation of high-quality development of the Company.

In terms of electric power construction, adhering to the green development concept, the Company will take safety development as the basis, quality and efficiency as the centre, science and technology innovation as the support, and modern management as the means to coordinate and grasp the safety, quality, progress, cost, equipment, design, technological innovation, intelligent infrastructure and other comprehensive work, vigorously develop clean energy, continue to optimize the thermal power structure, accelerate the pace of transformation and upgrading, and ensure the effective improvement of quality and reasonable growth of quantity.

In terms of electric power generation, 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 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 environmental protection well as demanded by the ecological civilization construction of various regions to consolidate the leading position in safety production, energy conservation and environmental protection.

In terms of electric power marketing, the Company will insist on efficiency first, quantity and price co-ordination, make every effort to do a good job in market transactions, and focus on stabilizing the revenue from long-term agreements, while making reasonable use of spot market rules to increase spot revenue. The Company will actively respond to the reform of the electricity market, promote the construction of institutional mechanisms, improve information systems, enhance technical support capabilities and strengthen talent training. The Company will make every effort to develop the electricity sales market and improve the operation of our energy marketing companies, while further promoting the optimisation of carbon market transactions. The Company will strive, to achieve a domestic power generation capacity of around 469 billion kWh in 2023.

In terms of fuel, the Company will scientifically coordinate the relationship between supply assurance and price control, strictly controlling fuel costs while fulfilling its responsibility for energy security. The Company will make every effort to improve the performance rate of coal contracts and give full play to the role of ballast in long-term contracts. Rigidly implement the coal and electricity industry synergy plan and give full play to the role of internal supply underwriting protection. At the same time, the Company actively optimises the coal procurement structure, accurately procured imported coal and made every effort 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.

In the new year, the Company will further strengthen its confidence, work hard and implement the work in a coordinated manner to ensure safety, improve quality and efficiency, upgrade and restructure, reform and innovate and other work. The Company will also further deepen the implementation of the Company's development strategy and accelerate the pace of establishing a world-class listed power generation company.

SUMMARY OF FINANCIAL INFORMATION AND OPERATING RESULTS

Please refer to the Financial Highlights on pages 6 to 9 for the summary of the operating results and assets and liabilities of the Company and its subsidiaries as at 31 December 2022 and for the accounting year ended 31 December 2022.

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 2022, which have been reviewed by the Company's Audit Committee.

DISTRIBUTABLE RESERVE

The distributable reserve as at 31 December 2022 calculated in accordance with the Company's Articles of Association is set out in Note 22 to the financial statements prepared under the IFRSs.

DIVIDENDS

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.

The Company's Articles of Association clearly defines 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.

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	N/A
1995	–	0.24	N/A
1996	–	0.27	N/A
1997	–	0.33	N/A
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 (restated)	–	-0.80	N/A
2022**	–	-0.65	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.

** The proposed 2022 dividend distribution plan will be implemented after having obtained approval from shareholders at the annual general meeting.

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.

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 coal-fired and gas-fired power plants, new energy generation projects and supporting ports, shipping, incremental distribution grid and other facilities throughout China and abroad by making use of modern technology and equipment and financial resources available domestically and internationally to provide electricity, heat and integrated energy services to the community.

SUBSIDIARIES AND ASSOCIATES

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

BONDS

During the year, the Company successfully issued bonds with a total principal amount of RMB51.100 billion in meeting its operational needs. Please refer to Note 25 and 29 to the financial statements prepared under the IFRSs for details.

BANK LOANS AND OTHER BORROWINGS

Please refer to Notes 24 and 30 to the financial statements prepared under the IFRSs for details of bank loans and other borrowings of the Company and its subsidiaries as at 31 December 2022.

CAPITALIZED INTERESTS

Please refer to Note 6 to the financial statements prepared under the IFRSs for details of the capitalized interests of the Company and its subsidiaries as at 31 December 2022.

PROPERTIES, PLANTS AND EQUIPMENT

Please refer to Note 7 to the financial statements prepared under the IFRSs for details of properties, plants and equipment of the Company and its subsidiaries as at 31 December 2022.

RESERVES

Please refer to the consolidated statement of changes in equity on pages 118 to 121 of the financial statements prepared under the IFRSs for details of statutory reserves of the Company and its subsidiaries as at 31 December 2022.

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 2022 were China Huaneng Group Fuel Co., Ltd. (Huaneng Group, the ultimate controlling shareholder of the company, holds about 73% of its equity), Huaneng Supply Chain Platform Technology Co., Ltd. (Huaneng Group holds about 45% of its equity), Coal Sales Branch Company of Huaneng Inner Mongolia East Energy Co., Ltd. (Huaneng Group holds 100% of its equity), Gansu Huating Coal-fired Power Co., Ltd. (Huaneng Group holds about 42% of its equity), and Huayang New Material Technology Co., Ltd., respectively. The total purchase from them amounted to approximately RMB98.577 billion, representing approximately 42% of the total purchase of the year. The largest supplier was China Huaneng Group Fuel Co., Ltd., the purchase from which amounted to RMB55.195 billion, representing approximately 24% 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 2022 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 RMB98.383 billion, 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 RMB37.348 billion, representing approximately 15% of the total sales of power for the year.

Save as disclosed above, none of the directors, supervisors and their respective close associates (as defined in the Listing Rules) or any shareholders (holding 5% or more of the issued shares of the Company to the best knowledge of the Board) had any interest in the five largest suppliers and customers of the Company mentioned above in 2022.

CONTINUING CONNECTED TRANSACTIONS AND CONNECTED TRANSACTIONS

The following are the continuing connected transactions and connected transactions of the Company in 2022 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 equity interest and a 25% indirect equity interest in HIPDC. HIPDC, as the direct 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, 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. 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 of 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 3 November 2021 for a term commencing on 1 January 2022 and expiring on 31 December 2022. 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 2022, the cap 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 RMB2.1billion. The actual transaction amount for the year ended 31 December 2022 was approximately RMB785 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.

  Pursuant to the Huaneng Group Framework Agreement, the cap for the purchase of fuel and transportation service by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates in 2022 shall be RMB120 billion. The actual transaction amount for the year ended 31 December 2022 was approximately RMB91.836 billion.

- 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 cap with respect to the leasing of facilities, land and office spaces for 2022 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 2022 was approximately RMB154 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 Frame work Agreement, the terms and the prices of transactions with respect to technical services, engineering contracting services and other services 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 2022 under the Huaneng Group Framework Agreement will not exceed RMB4.2 billion. The actual transaction amount for the year ended 31 December 2022 was approximately RMB2.384 billion.

- 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 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 2022 was RMB400 million. The actual transaction amount for the year ended 31 December 2022 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 2022 was RMB500 million. The actual transaction amount for the year ended 31 December 2022 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 2022, the annual cap with respect to purchase of electricity by the Company and its subsidiaries from Huaneng Group and its subsidiaries and associates was RMB3.6 billion. The actual transaction amount for the year ended 31 December 2022 was approximately RMB0.49 million.

- The electricity sale by the Company and its subsidiaries to 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 sell electricity to users of related persons (including Huaneng Group and its subsidiaries and associates) or electricity sales companies, and settle through the grid enterprises in accordance with the contractual agreement 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 2022, the annual cap with respect to sale of electricity by the Company and its subsidiaries to Huaneng Group and its subsidiaries and associates was RMB100 million. The actual transaction amount for the year ended 31 December 2022 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 2022 was RMB300 million. The actual transaction amount for the year ended 31 December 2022 was approximately RMB64 million.

- The Company and Huaneng Group signed a Supplemental Agreement to the Huaneng Group Framework Agreement on 18 October 2022. During the period from 1 January 2022 to 31 December 2022, the Company and its subsidiaries will provide Huaneng Group including its subsidiaries and associates the newly transactions regarding sales of carbon emission reduction resources and related services, and the purchase of carbon emission reduction resources and related services. According to the Supplemental Agreement to the Huaneng Group Framework Agreement, the price/fee for the sale of carbon emission reduction resources and related services, and the purchase of carbon emission reduction resources and related services shall be agreed and confirmed by both parties, and shall be conducted according to the prevailing market prices and conditions and the principle of arm's length negotiation and decision. When a specific transaction occurs, Huaneng Group, including its subsidiaries and associates, sale of carbon emission reduction resources and related services to the Company and its subsidiaries by Huaneng Group and its subsidiaries and associates and/or sale of carbon emission reduction resources and related services by the Company and its subsidiaries to Huaneng Group, including its subsidiaries and associates, shall be on terms no less favourable than those available to the Company and its subsidiaries from independent third parties.

  Pursuant to the Supplemental Agreement to the Huaneng Group Framework Agreement, the cap in respect of the sale of carbon emission reduction resources and related services by the Company and its subsidiaries to Huaneng Group, including its subsidiaries and associates, for 2022 was RMB500 million. The actual transaction amount for the year ended 31 December 2022 was approximately RMB464 million. The cap in respect of the purchase of carbon emission reduction resources and related services by the Company and its subsidiaries from Huaneng Group, including its subsidiaries and associates, for 2022 was RMB500 million. The actual transaction amount for the year ended 31 December 2022 was approximately RMB57 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 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 Huaneng Finance Framework Agreement, for the period from 1 January 2022 to 31 December 2022, the outstanding balances of the deposits of the Company and its subsidiaries placed with Huaneng Finance shall not exceed RMB20 billion (or its equivalent in foreign currency) on a daily basis. For the year ended 31 December 2022, the maximum deposits of the Company and its subsidiaries with Huaneng Finance was approximately RMB19.991 billion.

(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 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 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 2022, 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 approximately RMB2.565 billion, and the actual amount of lease Interest was approximately RMB124 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 approximately RMB562 million, and the Lease Interest was approximately RMB18 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, 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.

3. Continuing Connected Transaction with the connected subsidiaries of the Company

As disclosed above, Huaneng Group is a connected person of the Company, Huaneng Shandong Power Generation Co., Ltd. ("Shandong Company") is a controlled subsidiary of the Company, in which the Company holds 80% equity interest, and the remaining 20% equity interest is held by Huaneng Group. Huaneng Chaohu Power Generation Co., Ltd. ("Chaohu Power") is a controlled subsidiary of the Company, in which the Company holds 60% equity interest, Hua Neng HK holds 10% of the equity interest, and Huaihe Energy Power Group Co., Ltd. holds the remaining 30% equity interest. Huaihe Energy Power Group Co., Ltd. and its ultimate beneficial owners are persons independent of the Company and its connected persons. Therefore, Shandong Company and Chaohu Power are connected subsidiaries of the Company. The transactions between the Company and each of Shandong Company and Chaohu Power constitute the connected transaction under the Listing Rules.

In order to implement the requirements of the Executive Meeting of the State Council and to achieve the goals of reducing losses of thermal power units, ensuring energy supply and security, and reducing the overall asset-liability ratio, the Company had proposed to advance renewable entrusted loans to Shandong Company and Chaohu Power. On 2 November 2022, the Company entered into a framework agreement with Shandong Company and Chaohu Power respectively, stipulating that the Company will provide a renewable entrusted loan of not more than RMB12 billion to Shandong Company, and a renewable entrusted loan of not more than RMB1.2 billion to Chaohu Power. The aforesaid loans had no fixed term, the specific terms of which are subject to separate renewable entrusted loan agreements to be entered and governed by the framework agreements. The extended loan term was one year as a cycle, and the initial loan term shall start from the date of advancement. The purpose of the loan is to guarantee the supply of thermal power enterprises. The interest under aforesaid framework agreements shall be determined by the Company, and the fixed interest rate shall be adopted. The annual interest rate shall be the total amount of upstream fund raising costs and related taxes, etc., and the actual signed renewable entrusted loan interest rate shall prevail. For the details, please refer to the announcement of the Company dated 3 November 2022 and the circular of the Company dated 16 December 2022 respectively.

For the year ended 31 December 2022, no transaction was conducted between the Company and Shandong Company or Chaohu Power pursuant to the aforesaid framework agreements.

CONNECTED TRANSACTIONS

1. Formation of Project Companies

On 30 June 2022, Huaneng (Ji'an) New Energy Co., Ltd. ("Ji'an Company") and China Huaneng Group (Hong Kong) Treasury Management Holding Limited ("Hong Kong Treasury Company") entered into the Joint Venture Agreement of Jiangxi Nanchang Jinxian Clean Energy Project. Pursuant to the terms and conditions of the Joint Venture Agreement of Jiangxi Nanchang Jinxian Clean Energy Project, Ji'an Company and Hong Kong Treasury Company will jointly fund the establishment of Huaneng (Jinxian) New Energy Co., Ltd.* ("Jinxian Company"). Ji'an Company contributed RMB504 million, and Hong Kong Treasury Company contributed the equivalent of RMB216 million in US dollars. After the completion of the transaction, Ji'an Company holds 70% of the equity interests in Jinxian Company, while Hong Kong Treasury Company holds 30% of the equity interests in Jinxian Company. Jinxian Company became a connected subsidiary of the Company and the financial results of Jinxian Company was consolidated into the financial statements of the Company.

On 30 June 2022, Ji'an Company and Hong Kong Treasury Company entered into the Joint Venture Agreement of Jiangxi Ji'an Yongxin Clean Energy Project. Pursuant to the terms and conditions of the Joint Venture Agreement of Jiangxi Ji'an Yongxin Clean Energy Project, Ji'an Company and Hong Kong Treasury Company will jointly fund the establishment of Huaneng (Yongxin) New Energy Co., Ltd.* ("Yongxin Company"). Ji'an Company contributed RMB462 million, and Hong Kong Treasury Company contributed the equivalent of RMB198 million in US dollars. After the completion of the transaction, Ji'an Company holds 70% of the equity interests in Yongxin Company, while Hong Kong Treasury Company holds 30% of the equity interests in Yongxin Company. Yongxin Company became a connected subsidiary of the Company and the financial results of Yongxin Company was consolidated into the financial statements of the Company.

On 30 June 2022, Huaneng Jilin Power Generation Limited Company ("Jilin Company") and Hong Kong Treasury Company entered into the Joint Venture Agreement of Jilin Clean Energy Company. Pursuant to the terms and conditions of the Joint Venture Agreement of Jilin Clean Energy Company, Jilin Company and Hong Kong Treasury Company will jointly fund the establishment of Huaneng (Jilin) Clean Energy Development Co., Ltd. ("Jilin Clean Energy Company"). Jilin Company contributed RMB2,100 million and Hong Kong Treasury Company contributed the equivalent of RMB900 million in US dollars. After the completion of the transaction, Jilin Company holds 70% of the equity interests in Jilin Clean Energy Company, while Hong Kong Treasury Company holds 30% of the equity interests in Jilin Clean Energy Company. Jilin Clean Energy Company became a connected subsidiary of the Company and the financial results of Jilin Clean Energy Company was consolidated into the financial statements of the Company.

On 30 June 2022, Huaneng (Shanghai) Clean Energy Development Co., Ltd. ("Shanghai Clean Energy Company") and Hong Kong Treasury Company entered into the Joint Venture Agreement of Wanshizhen New Energy Project. Pursuant to the terms and conditions of the Joint Venture Agreement of Wanshizhen New Energy Project, Shanghai Clean Energy Company and Hong Kong Treasury Company will jointly fund the establishment of Wuxi Huashi New Energy Co., Ltd.* ("Huashi Company"). Shanghai Clean Energy Company contributed RMB112 million, and Hong Kong Treasury Company contributed the equivalent of RMB48 million in US dollars. After the completion of the transaction, Shanghai Clean Energy Company holds 70% of the equity interests in Huashi Company, while Hong Kong Treasury Company holds 30% of the equity interests in Huashi Company. Huashi Company became a connected subsidiary of the Company and the financial results of Jilin Clean Energy Company was consolidated into the financial statements of the Company.

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

For details on the formation of above-mentioned project companies, please refer to the Company's announcement dated 1 July 2022.

2. Capital Increase in Shidaowan Nuclear

On 18 October 2022, the Company entered into the Capital Increase Agreement with Huaneng Nuclear Power Development Co., Ltd.("Huaneng Nuclear"), State Nuclear Power Technology Co., Ltd. ("State Nuclear"), Huaneng International Power Development Corporation ("HIPDC") and Huaneng Shidaowan Nuclear Power Development Co., Ltd. ("Shidaowan Nuclear"), pursuant to which the Company Huaneng Nuclear, State Nuclear and HIPDC will subscribe the new registered capital of Shidaowan Nuclear in cash in the same proportion according to their respective shareholding ratios. The Company subscribed for part of the newly increased registered capital of Shidaowan Nuclear with RMB126 million, Huaneng Nuclear subscribed for part of the newly increased registered capital of Shidaowan Nuclear with RMB168 million, State Nuclear subscribed for part of the newly increased registered capital of Shidaowan Nuclear with RMB140 million, and HIPDC subscribed for part of the newly increased registered capital of Shidaowan Nuclear with RMB126 million. Following completion of the capital increase, the registered capital of Shidaowan Nuclear increased to RMB4,750 million and the Company's shareholding interest in Shidaowan Nuclear remains unchanged at 22.5%.

According to the relevant provisions of the Listing Rules, HIPDC is a connected person of the Company, while Huaneng Nuclear is an associate of the connected person of the Company. The capital increase constitutes a connected transaction of the Company, and is subject to the relevant disclosure and/or independent shareholders' approval requirements under the Listing Rules.

For details on capital increase in Shidaowan Nuclear, please refer to the Company's announcement dated 19 October 2022.

In accordance with the requirements of Rule 14A.55 and 14A.71 of the Listing Rules, 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

(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 IFRSs 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 avoiding business competition during its initial public offerings at home and abroad. On 17 September 2010, the Company received an undertaking from the 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 undertakings and are being currently performed. The Items (2) and (3) are undertakings with terms and conditions and have been fulfilled.

Currently, the Company has 14 directors and 4 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 2022.

DIRECTORS OF THE COMPANY

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

Name of Director	Position	Date of appointment
Zhao Keyu	Chairman	Appointed on 5 March 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
Name of Resigned Director	**Position**	**Date of appointment**
Zhao Ping	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 2022.

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

For the year ended 31 December 2022, 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 2022, 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 2022 on 20 March 2023 and the Company considers 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 IFRSs.

THE FIVE HIGHEST PAID EMPLOYEES

Details of the five highest paid employees of the Company are set out in Note 37 to the financial statements prepared under the IFRSs.

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 2022, 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.

SHAREHOLDINGS OF MAJOR SHAREHOLDERS

The following table sets out the shareholdings of the top ten shareholders of the Company as at 31 December 2022:

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	4,172,175,180	26.58%
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	258,452,600	1.65%
Liaoning Energy Investment (Group) Limited Liability Company	244,205,000	1.56%
Dedicated Securities Account of Contractual Repurchase Securities Trading of Guotai Junan Securities Co., Ltd.	175,613,600	1.12%
Dalian City Investment Holding Group Co., Ltd.	125,886,400	0.80%

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

As at 31 December 2022, 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) 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	1,555,124,549(L)	Beneficial owner	9.91%(L)	14.14%(L)	–
China Huaneng Group Co., Ltd. (Note 4)	H Shares	603,596,000(L)	Beneficial owner	3.85%(L)	–	12.84%(L)
Wisdomshire Asset Management Co., Ltd.	H Shares	282,652,000 (L)	Investment manager	1.80(L)	–	6.01(L)

Notes:

(1) The letter "L" denotes a long position.

(2) As of 31 December 2022, China Huaneng Group Co., Ltd. held 75% direct interests and 25% indirect interests in Huaneng International Power Development Corporation.

(3) Besides of the 1,555,124,549 domestic shares, China Huaneng Group Co., Ltd. holds 29,994,199 domestic shares through its controlling subsidiary, China Huaneng Finance Corporation Limited.

(4) China Huaneng Group Co., Ltd. holds 472,000,000 H shares through its wholly-owned subsidiary, China Hua Neng Group Hong Kong Limited, and holds 131,596,000 H shares through its indirect wholly-owned subsidiary, China Huaneng Group Treasury Management (Hong Kong) Limited.

Save as stated above, as at 31 December 2022, 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.

DIRECTORS' AND SUPERVISORS' RIGHT TO PURCHASE SHARES

The Company has adopted a code with the standard not lower than that of the Model Code for Securities Transactions by Directors of Listed Issuers as set out in Appendix 10 to the Listing Rules. Following enquiries made by the Company, all Directors and Supervisors confirmed that they have complied with the Code throughout 2022.

As at 31 December 2022, none of the Directors, Chief Executive Officer or Supervisors of the Company had any interest or short position in the shares, underlying shares and/or debentures (as the case may be) of the Company or any of its associated corporations (within the definition of Part XV of the SFO) which was required to be notified to the Company and the Hong Kong Stock Exchange pursuant to Divisions 7 and 8 of Part XV of the SFO (including interest and short position which any such Director, chief executive officer or Supervisor is taken or deemed to have under such provisions of the SFO) or which was required to be entered in the register required to be kept by the Company pursuant to Section 352 of the SFO or which was otherwise 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 Companies as contained in Appendix 10 to the Listing Rules.

INTEREST IN CONTRACTS AND SERVICE CONTRACTS

Save for the service contracts mentioned below, as at the end of 2022, 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 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 21% 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 62% 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 17% of the total remuneration.

According to the resolution at the general meeting, the Company paid each independent director a subsidy amounting to RMB300,000 (inclusive of tax) in 2022. 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 one extraordinary general meeting.

1. The Company's 2021 Annual General Meeting was held on 28 June 2022. The resolutions passed at the meeting were published in China Securities Journal and Shanghai Securities News on 29 June 2022.

2. The Company's 2022 First Extraordinary General Meeting was held on 30 December 2022. The resolutions passed at the meeting were published in China Securities Journal and Shanghai Securities News on 31 December 2022.

DISCLOSURE OF MAJOR EVENTS

1. Based on commercial considerations, the Company submitted a delisting notification letter to the New York Stock Exchange ("NYSE") on 17 June 2022, proposing to voluntarily delist from the NYSE; after the closing of the market on 7 July EST, the delisting of the Company ADS from the NYSE had became effective; on 6 October EST, the Company's overseas listing of ordinary shares took effect after being deregistered by the Securities and Exchange Commission.

2. Adjustments to the management of the Company: On 26 September 2022, Mr. Zhao Ping resigned from his position as the President and Executive Director of the Company due to age reasons. On 26 December 2022, Mr. Liu Wei resigned from his position as the Chief Engineer of the Company due to work relocation. On 26 February 2023, Mr. Chen Shuping ceased to hold the position of Vice President of the Company due to age reasons.

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 2022" 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 2022, in accordance with the requirements under the Environmental, Social and Governance Reporting Guidelines of the Hong Kong Stock Exchange, 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 (www.hpi.com.cn: Investor Relationship-ESG Report) and the website of Hong Kong Stock Exchange (www.hkexnews.hk) together with the annual report as scheduled. If you wish to request a printed copy of the "2022 Environmental, Social and Governance Report" of the Company, you can contact the Company by sending email to zqb@hpi.com.cn.

In 2022, the company selected into the "List of ESG Best Practice Cases of A-share Listed Companies in 2022" published by China Association of Listed Companies, and was invited to share experiences at the ESG Training Conference for Directors and Supervisors of Listed Companies held by Beijing Securities Regulatory Bureau.

CODE OF CORPORATE GOVERNANCE PRACTICES

The Company had complied with all the code provisions except for code provision C.2.1 of the corporate governance code as set out in Appendix 14 to the Listing Rules during the reporting period. For further details, please refer to the section headed "Corporate Governance Report" contained in this annual report of the Company.

DESIGNATED DEPOSIT

As at 31 December 2022, 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.

POVERTY ALLEVIATION EXPENDITURE

In 2022, the expenditure on targeted poverty alleviation funds and village revitalisation projects in the PRC in the name of the Company totaled RMB12.982 million.

LEGAL PROCEEDINGS

As at 31 December 2022, 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.

CHANGES IN INFORMATION OF DIRECTORS AND SUPERVISORS DURING THE REPORTING PERIOD

On 26 September 2022, Mr. Zhao Ping resigned from his position as the President and Executive Director of the Company due to age reasons.

ANNUAL GENERAL MEETING AND CLOSURE OF REGISTER

As the Company has yet to confirm the date of the 2022 annual general meeting, the record date for determining the eligibility to attend and vote at the 2022 annual general meeting and the period for closure of register, the Company will upon confirmation thereof announce such details in the notice of the 2022 annual general meeting. Such notice is expected to be issued to shareholders in May 2023.

AUDITORS

As approved at the 2021 annual general meeting, Ernst & Young Hua Ming LLP was appointed as the Company's domestic and U.S. 20F Annual Report auditor for 2022, and Ernst & Young, registered public interest entity auditor, was appointed as the Hong Kong auditor of the Company for 2022. The Company did not change its auditors for the past three years.

By Order of the Board
Zhao Keyu
Chairman

Beijing, the PRC
21 March 2023

REPORT OF THE SUPERVISORY COMMITTEE

TO ALL SHAREHOLDERS,

In 2022, 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.

The report on the work of the Supervisory Committee in 2022 is as follows:

1. OVERALL EVALUATION ON THE COMPANY'S OPERATION IN 2022

In 2022, the Board of the Company insisted on inheriting the "three colors" mission, grasped the new development stage, implemented the new development concept, constructed a new development pattern, strove for progress while maintaining stability, scientifically implemented policies, constantly improved the governance corporate system, made an overall plan to promote the implementation of the "14th Five-Year Plan", accelerated the pace of transformation and upgrading, and strove to push the Company's high-quality development to a new level. The management of the Company conscientiously implemented the decision-making arrangements of the Board, adhered to the problem orientation and forged ahead amidst difficulties, united and led all employees to strengthen the responsibility of power supply guarantee, actively respond to the market changes such as electricity, coal and capital, speed up the leap-forward development of new energy, and accelerated the optimization and upgrading of coal power structure. The Company achieved remarkable results in the epidemic prevention and control, safety production, low-carbon transformation, quality and efficiency improvement, overseas project management, and scientific and technological innovation. Except for the losses in the operating results due to the high ratio of the installed coal machine and high coal prices during the year, the Company's production, politics and image security remained overall stable.

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 conscientiously executed the decisions and arrangements made by the Board, and carried out work in strict accordance with various management systems. There is no violation of any regulations in the operation.

2. PARTICULARS OF WORK PERFORMED BY THE SUPERVISORY COMMITTEE

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

In 2022, the Company's Supervisory Committee, in accordance with applicable laws, the Articles of Association and actual needs of the Company's development, held in a total of 4 meetings, including 2 on-site meetings and 2 communication meetings, at which 16 proposals, including the annual work report of the Supervisory Committee, annual financial account report, annual budget report, proposal of provision for significant asset impairment, and special report on raised funds. The Supervisory Committee attended the general meeting and organized to conduct ballot monitoring and ballot counting, and fully performed the supervision and inspection responsibilities. 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.

(2) Training for the Supervisors

All Supervisors of the Company paid close attention to the improvement of duties performance. They thoroughly studied and implemented the Task Plan on Enhancing the Quality of Listed Companies Controlled by Central Enterprises issued by the State-owned Assets Supervision and Administration Commission of the State Council and the Self-Regulatory Supervision Guidelines for Companies Listed on Shanghai Stock Exchange and other laws and regulations in the places where the Company's shares are listed, 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

(1) Legality of the Company's operations

In 2022, 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 the 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 the Company strictly complied with the laws and regulations of the jurisdictions in which the Company's shares are listed and the Articles of Association of the Company, and the deliberation and decision-making on major issues were legal, compliant and reasonable; the Board of Directors gave full play to the role of "determining strategies, making decisions and preventing risks", and ensured that corporate governance was legal, compliant, efficient and orderly; and the management of the Company took the lead in setting an example, was loyal to their duties, conscientiously implemented the decisions and arrangements of the general meetings and the meetings of the Board of Directors, and did not violate the laws and regulations and the Articles of Association of the Company or cause any damages to the interests of the Company and shareholders.

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

The Supervisory Committee held 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 2022 issued by the domestic and international auditors respectively at the regular meeting for the year 2022.

The Supervisory Committee is of the view that the preparation, audit and disclosure procedures of the periodic reports have complied with the requirements of the Company Law, the Accounting Law and the Articles of Association of the Company, etc.. The sound financial system, standardized financial operation and well-established internal control of the Company is in place. The content of the reports has truly, accurately and completely reflected the financial position and operating results of the Company for 2022.

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

In 2022, 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 Special Report on the Placement and Actual Use of the Raised Funds for 2021 to ensure the legal compliance of the continued use and management process of surviving raised funds; attended meetings of Board and reviewed 8 proposals including the Proposal regarding the capital increase in Huaneng Shidaowan Nuclear Power Development Co., Ltd. and connected transactions, the proposal regarding the increase of the category and the cap amount of the continuing connected transactions for 2022 between the Company and Huaneng Group, the Proposal regarding the continuing connected transactions for 2023 between the Company and Huaneng Group, the Proposal regarding the continuing connected transactions between the Company and Tiancheng Leasing from 2023 to 2025 and the Proposal to the adjust by increasing the cap amount of the continuing connected transactions on loan advancement between the Company and Huaneng Finance 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 compliance and fairness of significant events including fund raising and connected transactions. No violation of laws and regulations in the relevant decision-making matters implemented by the Company and no unfairness in the trading prices 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 the information disclosure made by the Company by attending the Chairman office meetings, the President office meetings, the Information Disclosure Committee and other daily operations and management meetings. The Supervisory Committee placed great emphasis on and presented 4 on-site meetings, including the annual and semi-annual meetings of the Board and supervised the preparation and the review process related to the annual, interim and quarterly reports of the Company. In addition, the Supervisory Committee convened meetings at which its members reviewed the Company's relevant reports, listened to the reports on work related to information disclosure and signed a written confirmation. Meanwhile, the Supervisory Committee checked the procedures of filing insider information and relevant filing materials, and faithfully performed the supervision function.

The Supervisory Committee is of the view that the Company's various system on information disclosure was well-established and sound, and the control and procedure were complete and effective. The procedures of information disclosure strictly complied with the relevant systems such as the "Measures on Information Disclosure Management" and the "the Management Measures of Insider Information", and met the regulatory requirements of the places where the Company's shares are listed.

(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 regulatory requirements of the Company's listing places and the system has been effectively implemented. The Company's internal control system is complete, reasonable and effective, and is free and clear of any major defects. The Company's existing internal control management system can provide a solid guarantee for the healthy operation of the Company's businesses and the effective prevention of operating risks.

In 2023, the Supervisory Committee of the Company will continue to perform its diligence duty faithfully, keep working hard with a vigorous endeavor, and remain the commitment to fulfilling its supervisory duties and giving full play to its role as a supervisor. The Supervisory Committee will also continuously improve the performance ability and practicing level, effectively safeguard the legitimate rights and interests of the Company and the Shareholders, and make greater efforts to accelerate the pace of building a world-class listed power generation company and steadily drive the Company's high-quality development.

Supervisory Committee
Huaneng Power International, Inc.

Beijing, the PRC
21 March 2023

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT

PROFILES OF DIRECTORS AND SUPERVISORS

Directors

ZHAO Keyu, aged 56, 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 professor-level senior economist.

HUANG Jian, aged 60, is a Director of the Company, a director of HIPDC, a director of Shandong Power Generation Co., Ltd.. He was an assistant to the President of Huaneng Group, Chairman and Party Secretary of Huaneng Capital Services Co., Ltd. and Huaneng Carbon Assets 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 55, 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 vice president, president and Deputy Party Secretary of Shanxi branch of Huaneng Group, 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.

LU Fei, aged 58, is the Director of the Company, the Deputy Chief Economist of Huaneng Group, a director of HIPDC, 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 59, 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 served as Deputy Chief Accountant, Vice President, Chief Accountant and Party Member of Huaneng Hulun Buir Energy Development Co., Ltd., and 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 54, is the Director of the Company, Party Secretary and Chairman of Hebei Construction & Investment Group Co., Ltd. And Chairman of Huihai Financing and Leasing Co., Ltd.. He was a member of the standing committee of the Party committee,Vice President, President, Deputy Party Secretary, Vice Chairman of Hebei Construction & Investment Group Co., Ltd., President and Chairman of Hebei Construction & Investment Group Co., Ltd.. He was 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 59, 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 43, 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, postgraduate qualification, and a doctorate degree in engineering. He is a professor-level senior engineer.

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT

LIN Chong, aged 59, 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., Vice Chairman of Fujian Shuikou Power Generation Group 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 72, is an Independent Director of the Company, 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 71, 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 Chinese Society of Electrical Engineering and a fellow of the Institution of Engineering and Technology (FIET). 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 China Electricity Council and the Vice President of the Chinese Society of Power Engineering. He is a professor and a doctoral supervisor.

XU Haifeng, aged 67, 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 65, 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 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 65, is currently an Independent Director of the Company, a professor in Tsinghua University, the Expert of the National Electricity Exchange Agency Alliance, the Expert of Guangzhou Electricity Trading Centre, the Expert of China Southern Power Grid Corporation, the Expert of China Datang Power Generation Group, the Expert of State Power Investment Corporation Limited, the Deputy Director of the Power Market Special Committee of China Electrical Engineering Society, the Deputy Chairman of China Power Reform Forum, the Deputy Director of the Energy Storage Committee of the China Energy Research Association, Independent Director of Beijing E-techstar Co., Ltd., Independent Director of TBEA Co., Ltd., Independent Director of Beijing HyperStrong Technology Co., Ltd., Independent Director of Xuchang Intelligent Relay 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 59, 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 Party Member of the Company, the Executive Director, the President and Deputy Party Secretary 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 47, is the Vice Chairman of the Supervisory Committee of the Company, the Vice President and Member of Party Committee of Dalian City Investment Holding Group 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.

XIA Aidong, aged 54, is a Supervisor of the Company, the Director of the Audit Department and the Audit Center of Huaneng Group. He previously served as the Chief of Comprehensive and Budget Division of Huaneng Group and the Deputy Chief of the Budget and Comprehensive Planning Department of Huaneng Group. He graduated from Beijing Business School, majoring in accounting. He is a professor-level senior accountant.

GU Jianguo, aged 56, is a Supervisor of the Company, the Vice Chairman of Nantong Industries Holdings Group Limited and the Director of Nantong Investment & Management Limited Company. He was the Chief of Nantong Investment Management Centre, Chairman 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.

XU Jianping, aged 54, is a Supervisor, an assistant to the President and Secretary to Party Committee 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 professor-level senior engineer.

ZHU Tong, aged 51, 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.

PROFILES OF DIRECTORS, SUPERVISORS AND SENIOR MANAGEMENT

Biographies of Senior Management

HUANG Lixin, aged 56, is currently the Chief accountant and Member of Party Committee of the Company. He was the 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 55, is the Member of the Party Committee of the Company, and secretary of the Discipline & Inspection Commission. 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 professor-level senior economist.

HUANG Chaoquan, aged 57, is currently the Vice President, Member of Party Committee, Chairman of trade union and the Secretary to the Board of the Company. He was the Director of the Board Office, 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.

FU Qiyang, aged 59, 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

ZHAO Ping, aged 60, was the director, President and the Deputy Party Secretary of the Company during the reporting period. 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.

LIU Wei, aged 59, was 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 59, was the Vice President and a Member of Party committee of the Company. He was the Manager of Engineering Management of the Company, 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.

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

LEGAL ADVISERS TO THE COMPANY

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 Hong Kong law	Haiwen & Partners LLP Unit 1902, 19/F New World Tower 16-18 Queen's Road Central Central, Hong Kong

AUDITORS OF THE COMPANY

Domestic Auditors	Ernst & Young Hua Ming LLP 16/F, Ernst & Young Tower Oriental Plaza 1 East Chang'an Avenue Dongcheng District Beijing The PRC
Hong Kong Auditors	Ernst & Young *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
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 2022 and will be published in April 2023, respectively. 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 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
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.
Electricity Sold:	Electricity sold by power plants to grid companies.

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

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Quarry Bay, Hong Kong

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To the shareholders of Huaneng Power International, Inc.
(Established 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 341, which comprise the consolidated statement of financial position as at 31 December 2022, 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 2022, 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.

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 2022, the Group held property, plant and equipment ("PPE") with the amount of RMB336,127 million, representing 79.00% 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 were allocated to. As a result of the impairment assessment, impairment losses of RMB1,824 million were recognised by the management for the year ended 31 December 2022. Auditing management's impairment assessment of PPE 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.	We obtained an understanding of, evaluated the design of, 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 2022, the Group's goodwill was RMB14,385 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 for impairment testing. A goodwill impairment loss is recognised if the carrying amount of the CGU exceeds its recoverable amount. As a result of the impairment assessment, impairment losses of RMB898 million were recognised by the management for the year ended 31 December 2022. Auditing management's goodwill impairment assessment was 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 margins and terminal growth rates 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.	We obtained an understanding of, evaluated the design of, 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 margins, terminal growth rates, 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.

KEY AUDIT MATTERS *(Cont'd)*

Key audit matter	How our audit addressed the key audit matter
Recognition of deferred income tax assets	
At 31 December 2022, the Group had deferred income tax assets of RMB7,261 million from deductible temporary differences and tax losses carried forward before offsetting. At 31 December 2022, the Group did not recognise deferred income tax assets related to deductible temporary differences of RMB18,604 million and unused tax losses of RMB30,447 million. As described in Notes 2(w)(iii), 4(c) and 31 to the consolidated financial statements, the Group recognised deferred income 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 income tax assets is complex because it requires significant estimation and judgement 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 of, evaluated the design of, and tested the operating effectiveness of controls over the recognition of deferred income 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 years. 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 income 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.

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 Wang Jun Ying.

Ernst & Young
Certified Public Accountants
Hong Kong

21 March 2023

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

FOR THE YEAR ENDED 31 DECEMBER 2022
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

	Notes	For the year ended 31 December 2022	2021 (Restated)
Operating revenue	5	246,724,789	205,079,497
Tax and levies on operations		(1,442,438)	(1,686,346)
Operating expenses, net			
Fuel		(170,506,913)	(146,752,263)
Maintenance		(4,485,105)	(4,503,584)
Impairment losses on financial and contract assets		(48,257)	(103,625)
Depreciation	6	(24,380,204)	(22,275,231)
Labour	37	(16,147,626)	(16,117,018)
Service fees on transmission and transformer facilities of HIPDC		(47,947)	(47,947)
Purchase of electricity		(16,357,899)	(9,114,851)
Others, net	6	(15,683,187)	(11,632,782)
Total operating expenses		(247,657,138)	(210,547,301)
Loss from operations		(2,374,787)	(7,154,150)
Interest income		339,258	288,291
Financial expenses, net			
Interest expense	6	(9,962,125)	(8,798,200)
Exchange gain/(loss) and bank charges, net		136,151	(40,290)
Total financial expenses, net		(9,825,974)	(8,838,490)
Share of profits less losses of associates and joint ventures	8	1,042,108	848,100
Other investment gain/(loss)		5,438	(7,345)
Loss before income tax expense	6	(10,813,957)	(14,863,594)
Income tax expense	33	(158,658)	1,929,755
Net loss		(10,972,615)	(12,933,839)

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

	Notes	For the year ended 31 December 2022	2021 (Restated)
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		**(12,782)**	(46,808)
Share of other comprehensive income /(loss) of joint ventures and associates		**32,960**	(42,863)
Income tax effect		**3,324**	12,231
Items that may be reclassified subsequently to profit or loss:			
Share of other comprehensive income /(loss) of joint ventures and associates		**25,616**	(1,441)
Cash flow hedges:			
Effective portion of changes in fair value of hedging instruments arising during the year		**269,361**	1,235,874
Reclassification adjustments for losses included in profit or loss		**(1,401,283)**	(624,876)
Exchange differences on translation of foreign operations		**446,350**	(989,932)
Income tax effect		**192,427**	(103,870)
Other comprehensive loss, net of tax		**(444,027)**	(561,685)
Total comprehensive loss		**(11,416,642)**	(13,495,524)

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

FOR THE YEAR ENDED 31 DECEMBER 2022
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB unless otherwise stated)

	Notes	For the year ended 31 December 2022	2021 (Restated)
Net loss attributable to:			
– Equity holders of the Company		**(8,026,233)**	(10,377,939)
– Non-controlling interests		**(2,946,382)**	(2,555,900)
		(10,972,615)	(12,933,839)
Total comprehensive loss attributable to:			
– Equity holders of the Company		**(8,114,708)**	(10,675,616)
– Non-controlling interests		**(3,301,934)**	(2,819,908)
		(11,416,642)	(13,495,524)
Losses per share attributable to the shareholders of the Company (expressed in RMB per share)			
– Basic and diluted	34	**(0.65)**	(0.80)

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

AS AT 31 DECEMBER 2022
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

		As at 31 December	
	Notes	2022	2021 (Restated)
ASSETS			
Non-current assets			
Property, plant and equipment	7	336,126,522	320,819,879
Right-of-use assets	41	18,998,833	19,603,927
Investments in associates and joint ventures	8	24,015,630	23,085,837
Investment properties		632,565	635,268
Other equity instrument investments	10	708,912	729,070
Power generation licence	11	4,156,846	3,783,756
Mining rights	12	1,611,486	1,611,486
Deferred income tax assets	31	5,632,709	4,907,081
Derivative financial assets	13	3,570	69,753
Goodwill	14	14,384,909	14,276,224
Other non-current assets	15	19,227,929	19,056,005
Total non-current assets		425,499,911	408,578,286
Current assets			
Inventories	16	12,701,908	16,824,431
Other receivables and assets	17	14,076,384	14,698,932
Accounts and notes receivable	18	42,654,332	43,877,997
Contract assets	5(c)	68,738	66,974
Derivative financial assets	13	44,925	652,458
Bank balances and cash	35	17,175,575	16,350,332
Total current assets		86,721,862	92,471,124
Total assets		512,221,773	501,049,410

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

AS AT 31 DECEMBER 2022
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Notes	As at 31 December 2022	2021 (Restated)
EQUITY AND LIABILITIES			
Equity attributable to equity holders of the Company			
Share capital	20	15,698,093	15,698,093
Other equity instruments	21	62,083,704	48,417,977
Capital surplus		23,710,686	25,667,502
Surplus reserves	22	8,140,030	8,140,030
Reserve funds		117,308	–
Currency translation differences		(602,823)	(1,443,398)
Retained earnings		6,517,524	16,846,951
		115,664,522	113,327,155
Non-controlling interests	40	19,651,537	20,509,045
Total equity		135,316,059	133,836,200
Non-current liabilities			
Long-term loans	24	151,677,526	136,857,716
Long-term bonds	25	39,062,047	29,396,919
Lease liabilities	41	5,622,536	6,138,846
Deferred income tax liabilities	31	2,169,841	2,300,088
Derivative financial liabilities	13	245,613	99,323
Other non-current liabilities	26	6,794,804	6,022,017
Total non-current liabilities		205,572,367	180,814,909

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

	Notes	As at 31 December 2022	2021 (Restated)
EQUITY AND LIABILITIES *(Continued)*			
Current liabilities			
Accounts payable and other liabilities	27	**54,472,701**	54,609,553
Contract liabilities	5(c)	**3,348,828**	3,274,770
Taxes payable	28	**1,647,373**	2,053,418
Dividends payable		**617,576**	1,041,452
Derivative financial liabilities	13	**417,237**	41,034
Short-term bonds	29	**6,312,777**	8,222,517
Short-term loans	30	**83,573,497**	91,896,725
Current portion of long-term loans	24	**19,129,989**	17,213,799
Current portion of long-term bonds	25	**730,336**	7,175,540
Current portion of lease liabilities	41	**1,009,339**	800,521
Current portion of other non-current liabilities	26	**73,694**	68,972
Total current liabilities		**171,333,347**	186,398,301
Total liabilities		**376,905,714**	367,213,210
Total equity and liabilities		**512,221,773**	501,049,410

These financial statements were approved for issue by the Board of Directors on 21 March 2023 and were signed on its behalf by.

Zhao Keyu
Director

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

FOR THE YEAR ENDED 31 DECEMBER 2022
(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	Reserve funds	Currency translation differences	Retained earnings	Total	Non-controlling interests	Total equity
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
Effect of adoption of IAS 16	-	-	-	-	-	-	-	-	-	-	-	279,341	279,341	(1,154)	278,187
Balance as at January 1 2022 (Restated)	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)	16,846,951	113,327,155	20,509,045	133,836,200
Profit/(loss) for the year ended 31 December 2022	-	2,191,950	-	-	-	-	-	-	-	-	-	(10,218,183)	(8,026,233)	(2,946,382)	(10,972,615)
Other comprehensive income/(loss):															
Fair value changes of other equity investment instruments, net of tax	-	-	-	-	(9,458)	-	-	(9,458)	-	-	-	-	(9,458)	-	(9,458)
Share of other comprehensive income of investees – accounted for under the equity method, net of tax	-	-	-	-	32,960	25,616	-	58,576	-	-	-	-	58,576	-	58,576
Changes in fair value of effective portion and reclassification of cash flow hedges, net of tax	-	-	-	(978,168)	-	-	-	(978,168)	-	-	-	-	(978,168)	38,673	(939,495)
Currency translation differences	-	-	-	-	-	-	-	-	-	-	840,575	-	840,575	(394,225)	446,350
Total comprehensive income/(loss) for the year ended 31 December 2022	-	2,191,950	-	(978,168)	23,502	25,616	-	(929,050)	-	-	840,575	(10,218,183)	(8,114,708)	(3,301,934)	(11,416,642)

The notes on pages 125 to 341 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	Reserve funds	Currency translation differences	Retained earnings	Total	Non-controlling interests	Total equity
2021 dividends (Note 23)	-	-	-	-	-	-	-	-	-	-	-	-	-	(919,634)	(919,634)
Issue of other equity instruments (Note 21)	-	22,550,000	-	-	-	-	-	-	-	-	-	-	22,550,000	-	22,550,000
Redemption of other equity instruments (Note 21)	-	(9,000,000)	-	-	-	-	-	-	-	-	-	-	(9,000,000)	-	(9,000,000)
Cumulative distribution of other equity instruments (Note 21)	-	(2,136,535)	-	-	-	-	-	-	-	-	-	-	(2,136,535)	-	(2,136,535)
Net capital injection from non-controlling interests of subsidiaries	-	-	-	-	-	-	-	-	-	-	-	-	-	3,316,945	3,316,945
Share of other capital reserve of investees accounted for under the equity method	-	-	-	-	-	-	170,701	170,701	-	-	-	-	170,701	-	170,701
Acquisition of non-controlling interests of subsidiaries	-	-	-	-	-	-	6,857	6,857	-	-	-	-	6,857	4,165	11,022
Disposal of equity investments at fair value through other comprehensive income	-	-	-	-	(5,104)	-	-	(5,104)	-	-	-	5,104	-	-	-
Transfer from retained earnings	-	-	-	-	-	-	-	-	-	117,308	-	(117,308)	-	-	-
Others	-	60,312	-	-	-	-	(1,200,220)	(1,200,220)	-	-	-	960	(1,138,948)	42,950	(1,095,998)
Balance as at 31 December 2022	15,698,093	62,083,704	24,770,682	(570,194)	368,078	(81,735)	(776,145)	23,710,686	8,140,030	117,308	(602,823)	6,517,524	115,664,522	19,651,537	135,316,059

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

FOR THE YEAR ENDED 31 DECEMBER 2022
(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
Effect of adoption of IAS 16	–	–	–	–	–	–	–	–	–	–	21,086	21,086	51	21,137
Balance as at January 1 2021 (Restated)	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)	32,185,484	129,867,009	21,770,326	151,637,335
Profit/(loss) for the year ended 31 December 2021	–	2,137,420	–	–	–	–	–	–	–	–	(12,515,359)	(10,377,939)	(2,555,900)	(12,933,839)
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)	(12,515,359)	(10,675,616)	(2,819,908)	(13,495,524)

The notes on pages 125 to 341 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	–	(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)	16,846,951	113,327,155	20,509,045	133,836,200

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED 31 DECEMBER 2022
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Notes	For the year ended 31 December 2022	2021 (Restated)
OPERATING ACTIVITIES			
Loss before income tax expense		**(10,813,957)**	(14,863,594)
Adjustments to reconcile loss before income tax expense to net cash provided by operating activities:			
Depreciation of property, plant and equipment	6	**23,372,667**	21,495,686
Depreciation of investment property	6	**21,791**	30,162
Depreciation of right-of-use assets	6	**985,746**	749,383
Provision for impairment losses on property, plant and equipment	6	**1,823,978**	28,879
Provision for impairment of goodwill	6	**897,524**	–
Provision for impairment of other non-current assets	6	**400,194**	63,000
Amortisation of other non-current assets	6	**107,638**	69,717
Recognition of provision for loss allowance of receivables		**48,257**	103,625
Recognition/(reversal) of provision for inventory obsolescence	6	**6,486**	(242)
Other investment income		**(5,438)**	(7,515)
Net gain on disposal of non-current assets	6	**(128,837)**	(520,878)
Share of profits less losses of associates and joint ventures	8	**(1,042,108)**	(848,100)
Interest income		**(339,258)**	(288,291)
Interest expense	6	**9,962,125**	8,798,200
Others		**(1,327,978)**	(778,812)
Changes in working capital:			
Inventories		**4,103,453**	(10,216,073)
Other receivables and assets		**(701,844)**	(2,809,293)
Accounts and notes receivable		**1,150,951**	(6,734,986)
Contract assets		**(166,487)**	(139,990)
Restricted cash		**(25,741)**	45,043
Accounts payable and other liabilities		**(1,230,816)**	11,978,403
Contract liabilities		**68,444**	371,474
Taxes payable		**5,257,370**	1,099,111
Interest received		**339,258**	288,291
Income tax expense paid		**(243,868)**	(1,662,212)
Net cash provided by operating activities		**32,519,550**	6,250,988

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

	Notes	For the year ended 31 December 2022	2021 (Restated)
INVESTING ACTIVITIES			
Payment for the purchase of property, plant and equipment		**(40,584,836)**	(43,273,952)
Proceeds from disposal of property, plant and equipment, land use rights and other non-current assets		**448,543**	514,525
Payment for the purchase of other non-current assets		**–**	(47,087)
Cash dividends received		**697,287**	796,168
Capital injections for investments in associates and joint ventures		**(452,010)**	(643,428)
Cash paid for acquiring other equity instrument investments	3(b)	**–**	(111,313)
Proceeds from disposal of other equity instrument investments		**7,376**	–
Cash received from recovery of entrusted loans		**–**	302,640
Others		**53,762**	(31,659)
Net cash used in investing activities		**(39,829,878)**	(42,494,106)

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED 31 DECEMBER 2022
(Prepared in accordance with International Financial Reporting Standards)
(Amounts expressed in thousands of RMB)

	Notes	For the year ended 31 December 2022	2021 (Restated)
FINANCING ACTIVITIES			
Issuance of short-term bonds		**41,800,000**	43,200,000
Repayments of short-term bonds		**(43,700,000)**	(40,000,000)
Proceeds from short-term loans		**149,806,702**	139,416,406
Repayments of short-term loans		**(158,059,984)**	(113,866,543)
Proceeds from long-term loans		**74,390,113**	62,464,866
Repayments of long-term loans		**(59,249,646)**	(39,279,532)
Issuance of long-term bonds		**9,300,000**	15,680,393
Repayments of long-term bonds		**(6,500,000)**	(12,000,000)
Interest paid		**(13,013,654)**	(12,274,217)
Net proceeds from the issuance of other equity instruments		**22,550,000**	–
Redemption of other equity instruments		**(9,000,000)**	–
Net capital injection from non-controlling interests of subsidiaries		**3,316,945**	1,876,784
Dividends paid to shareholders of the Company		**–**	(2,825,657)
Dividends paid to non-controlling interests of subsidiaries		**(1,343,510)**	(673,859)
Lease payments		**(2,327,866)**	(1,860,532)
Cash paid for acquisition of non-controlling interests of a subsidiary		**–**	(186,189)
Others		**(137,613)**	(285,954)
Net cash provided by financing activities		**7,831,487**	39,385,966
Effect of foreign exchange rate changes, net		**441,124**	(845,915)
NET INCREASE IN CASH AND CASH EQUIVALENTS		**962,283**	2,296,933
Cash and cash equivalents as at beginning of the year		**15,554,825**	13,257,892
CASH AND CASH EQUIVALENTS AS AT END OF THE YEAR	35	**16,517,108**	15,554,825

The notes on pages 125 to 341 are an integral part of these consolidated financial statements.

NOTES TO THE FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 DECEMBER 2022
(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 established 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 established in the PRC. HIPDC does not prepare 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.

(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 2022, the Group had net current liabilities of approximately RMB84.61 billion, and a portion of the Group's funding requirements for capital expenditures were satisfied by short-term financing. Taking into consideration the unutilised banking facilities of approximately exceeding RMB290.0 billion as at 31 December 2022, 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 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*
Annual Improvements to IFRSs 2018-2020	Amendments to IFRS 1, IFRS 9, Illustrative Examples accompanying IFRS 16, and IAS 41

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

The nature and the impact of the revised IFRSs that are applicable to the Group are described below:

(i) Amendments to IFRS 3 Reference to the Conceptual Framework

Amendments to IFRS 3 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* (the "Conceptual Framework") 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 Group has applied the amendments prospectively to business combinations that occurred on or after 1 January 2022. As there were no contingent assets, liabilities and contingent liabilities within the scope of the amendments arising in the business combination that occurred during the period, the amendments did not have any impact on the financial position and performance of the Group.

(ii) Amendments to IAS 16 Property, Plant and Equipment: Proceeds before Intended Use

Amendments to IAS 16 prohibit an entity from 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 any such items, and the cost of those items, in profit or loss. The Group has applied the amendments retrospectively to items of property, plant and equipment made available for use on or after 1 January 2021.

The following adjustments were made to the amounts recognised in the Group's consolidated statement of financial position at 1 January 2022. Line items that were affected by the changes of this accounting standard were shown below:

	As previously reported	Effect of application of Amendments to IAS 16	As restated
Property, plant and equipment	320,589,625	230,254	320,819,879
Investments in associates and joint ventures	23,037,904	47,933	23,085,837
Retained earnings	16,567,610	279,341	16,846,951
Non-controlling interests	20,510,199	(1,154)	20,509,045

(Amounts expressed in thousands of RMB unless otherwise stated)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

The nature and the impact of the revised IFRSs that are applicable to the Group are described below: *(Cont'd)*

(ii) Amendments to IAS 16 Property, Plant and Equipment: Proceeds before Intended Use *(Cont'd)*

As a result of the application of Amendments to IAS 16, the relevant line items in the Group's consolidated statement of comprehensive income for the year ended 31 December 2021 have been restated. The following table shows the effect for each individual line item affected:

	As previously reported	Effect of application of Amendments to IAS 16	As restated
Operating revenue	204,605,083	474,414	205,079,497
Tax and levies on operations	(1,686,341)	(5)	(1,686,346)
Operating expenses, net			
Fuel	(146,539,362)	(212,901)	(146,752,263)
Depreciation	(22,270,421)	(4,810)	(22,275,231)
Labour	(16,107,285)	(9,733)	(16,117,018)
Others, net	(11,599,153)	(33,629)	(11,632,782)
Share of profits less losses of associates and joint ventures	804,386	43,714	848,100
Net loss attributable to non-controlling interests	(2,554,695)	(1,205)	(2,555,900)

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

The nature and the impact of the revised IFRSs that are applicable to the Group are described below: *(Cont'd)*

(ii) Amendments to IAS 16 Property, Plant and Equipment: Proceeds before Intended Use *(Cont'd)*

As a result of the application of Amendments to IAS 16, the relevant line items in the Group's consolidated statement of cash flows for the year ended 31 December 2021 have been restated. The following table shows the effect for each individual line item affected:

	As previously reported	Effect of application of Amendments to IAS 16	As restated
Loss before income tax expense	(15,120,644)	257,050	(14,863,594)
Depreciation of property, plant and equipment	21,490,876	4,810	21,495,686
Share of profits less losses of associates and joint ventures	(804,386)	(43,714)	(848,100)
Net cash generated from operating activities	6,032,841	218,147	6,250,988
Payment for the purchase of property, plant and equipment	(43,055,805)	(218,147)	(43,273,952)
Net cash used in investing activities	(42,275,959)	(218,147)	(42,494,106)

As a result of the application of Amendments to IAS 16, the relevant line items in the Group's consolidated statement of comprehensive income for the years ended 31 December 2022 and 2021 which have been affected are shown below:

	2022	2021
Operating revenue	823,353	474,414
Tax and levies on operations	203	5
Operating expenses, net		
Fuel	219,481	212,901
Labour	25,212	9,733
Others, net	33,922	33,629

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

The nature and the impact of the revised IFRSs that are applicable to the Group are described below: *(Cont'd)*

(iii) Amendments to IAS 37 Onerous Contracts – Cost of Fulfilling a Contract

Amendments to IAS 37 clarify that for the purpose of assessing whether a contract is onerous under IAS 37, the cost of fulfilling the contract comprises the costs that relate directly to the contract. Costs that relate directly to a contract include both the incremental costs of fulfilling that contract (e. g., direct labour and materials) and an allocation of other costs that relate directly to fulfilling that contract (e. g., an allocation of the depreciation charge for an item of property, plant and equipment used in fulfilling the contract as well as contract management and supervision costs). 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 Group has applied the amendments prospectively to contracts for which it has not yet fulfilled all its obligations at 1 January 2022 and no onerous contracts were identified. Therefore, the amendments did not have any impact on the financial position or performance of the Group.

(iv) Annual Improvements to IFRSs 2018-2020 Amendments to IFRS 1, IFRS 9, 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 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. The Group has applied the amendment prospectively to financial liabilities that are modified or exchanged on or after 1 January 2022. As there was no modification of the Group's financial liabilities during the period, the amendment did not have any impact on the financial position or performance of the Group.

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation *(Cont'd)*

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation *(Cont'd)*

(i) Business combinations *(Cont'd)*

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.

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation *(Cont'd)*

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

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(c) Consolidation *(Cont'd)*

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

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.

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

(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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

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. Depreciation of investment properties 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 investment properties, 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
Land use rights	40 – 50 years
Buildings	30 years

Rental income from investment properties is accounted for as described in Note 2(z).

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(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.

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(l) Impairment of non-financial assets *(Cont'd)*

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.

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

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

Measurement of ECLs *(Cont'd)*

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

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

Significant increases in credit risk *(Cont'd)*

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).

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

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

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.

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

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

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

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

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

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(w) Taxation *(Cont'd)*

(iii) Current and deferred income tax *(Cont'd)*

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.

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(y) Government grants *(Cont'd)*

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(z) Revenue and other income *(Cont'd)*

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(z) Revenue and other income *(Cont'd)*

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.

(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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(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 or US$5,000). Instead, the Group recognises the lease payments associated with those leases as an expense on a straight-line basis over the lease term.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(ab)Leases *(Cont'd)*

Group as a lessor *(Cont'd)*

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.

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.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(ad) Fair value management *(Cont'd)*

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.

(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.

(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)*

Amendments to IFRS 10 and IAS 28	*Sale or Contribution of Assets between an Investor and its Associate or Joint Venture*
Amendments to IFRS 16	*Lease Liability in a Sale and Leaseback*
Amendments to IAS 1	*Classification of Liabilities as Current or Non-current (the "2020 Amendments")*
Amendments to IAS 1	*Non-current Liabilities with Covenants (the "2022 Amendments")*
Amendments to IAS 1 and IFRS Practice Statement 2	*Disclosure of Accounting Policies*
Amendments to IAS 8	*Definition of Accounting Estimates*
Amendments to IAS 12	*Deferred Tax related to Assets and Liabilities arising from a Single Transaction*

(i) 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.

(ii) Amendments to IFRS 16 *Lease Liability in a Sale and Leaseback*

The amendments specify the requirements that a seller-lessee uses in measuring the lease liability arising in a sale and leaseback transaction to ensure the seller-lessee does not recognise any amount of the gain or loss that relates to the right of use it retains. The amendments are effective for annual periods beginning on or after 1 January 2024 and shall be applied retrospectively to sale and leaseback transactions entered into after the date of initial application of IFRS 16 (i. e.,1 January 2019). Earlier application is permitted. The amendments are not expected to have any significant impact on the Group's consolidated financial statements.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(af) Issued but not yet effective International Financial Reporting Standards *(Cont'd)*

(iii) Amendments to IAS 1 *Classification of Liabilities as Current or Non-current (the "2020 Amendments")*

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.

(iv) Amendments to IAS 1 *Non-current Liabilities with Covenants (the "2022 Amendments")*

The 2022 Amendments require additional disclosures by an entity that classifies liabilities arising from loan arrangements as non-current when it has a right to defer settlement of those liabilities that are subject to the entity complying with future covenants within 12 months after the reporting period. The amendments are effective for annual periods beginning on or after 1 January 2024 and shall be applied retrospectively. Earlier application is permitted. An entity that applies the 2020 Amendments early is required to apply simultaneously the 2022 Amendments, and vice versa. The Group is currently assessing the impact of the amendments and whether existing loan agreements may require revision. Based on a preliminary assessment, the amendments are not expected to have any significant impact on the Group's financial statements.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(af) Issued but not yet effective International Financial Reporting Standards *(Cont'd)*

(v) 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 revisiting their accounting policy information disclosures to ensure consistency with the amended requirements.

(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 amendments are not expected to have a material impact on the Group's financial statements.

(vii) Amendments to IAS 12 *Deferred Tax related to Assets and Liabilities arising from a Single Transaction*

In May 2021, the Board issued amendments to IAS 12, which narrow the scope of the initial recognition exception under IAS 12, so that it no longer applies to transactions that give rise to equal taxable and deductible temporary differences.

2 PRINCIPAL ACCOUNTING POLICIES *(Cont'd)*

(af) Issued but not yet effective International Financial Reporting Standards *(Cont'd)*

(vii) Amendments to IAS 12 *Deferred Tax related to Assets and Liabilities arising from a Single Transaction* (Cont'd)

The amendments should be applied to transactions that occur on or after the beginning of the earliest comparative period presented. In addition, at the beginning of the earliest comparative period presented, a deferred tax asset (provided that sufficient taxable profit is available) and a deferred tax liability should also be recognised for all deductible and taxable temporary differences associated with leases and decommissioning obligations. Early application is permitted.

The Group has applied the initial recognition exception and did not recognise a deferred tax asset and a deferred tax liability for temporary differences for transactions related to leases. Upon initial application of these amendments, the Group will recognise deferred tax for all temporary differences related to leases at the beginning of the earliest comparative period presented. The Group will apply the amendments from 1 January 2023 and is currently assessing the impact of the amendments.

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.

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(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 2022, if RMB had weakened/strengthened by 5% (2021: 5%) against US$ and 3% (2021: 3%) against EUR ("€") with all other variables constant, the Group would further recognise an exchange loss/gain amounting to RMB9 million (2021: RMB21 million) and RMB1 million (2021: RMB1 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.

As at 31 December 2022, if S$ had weakened/strengthened by 10% (2021: 10%) against US$ with all other variables constant, SinoSing Power and its subsidiaries would further recognise exchange loss/gain amounting to RMB563 million (2021: RMB364 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 2022, if PKR had weakened/strengthened by 5% (2021: 5%) against US$ with all other variables constant, Ruyi Pakistan Energy would further recognise an exchange gain/loss amounting to RMB49 million (2021: RMB55 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$. Ruyi Pakistan Energy entered into an agreement on a tariff adjustment mechanism with Central Power Purchasing Agency (Guarantee) Limited ("CPPA-G") and the tariff adjustment mechanism was approved by the National Electric Power Regulatory Authority. The mechanism mitigates foreign exchange risk by decreasing or increasing electricity tariff when PKR strengthens or weakens against US$.

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(i) Market risk *(Cont'd)*

(2) Price risk

The other equity instrument investments of the Group designated as at FVOCI 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.

(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 2022, 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 RMB1,036 million (2021: RMB1,002 million) higher/lower. If interest rates on US$-denominated borrowings had been 50 basis points higher/lower with all other variables held constant, interest expense for the year would have been RMB52 million (2021: RMB43 million) higher/lower. If interest rates on S$-denominated borrowings had been 100 basis points higher/lower with all other variables held constant, interest expense for the year would have been RMB50 million (2021: RMB62 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.

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(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.

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. As at 31 December 2022, most relevant projects of the Company and its subsidiaries have been approved for renewable energy subsidies, and some projects are under application for approval.

3 FINANCIAL AND CAPITAL RISKS MANAGEMENT *(Cont'd)*

(a) Financial risk management *(Cont'd)*

(ii) Credit risk *(Cont'd)*

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.

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 RMB0.04 million.

The Group measures loss allowances for receivables at an amount equal to lifetime ECLs, which is calculated using a provision matrix. As at 31 December 2022, for accounts receivable amounting to RMB2,736 million with specific credit risk, the Group measures their credit risk individually and recognised loss allowances amounting to RMB117 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.

Accounts receivable and contract assets	Gross carrying amount	ECL	Loss allowance
Receivables from domestic sales of power	35,162,732	0.00%	–
Receivables from domestic sales of heat	2,632,605	0.00%	–
Receivables from overseas sales of power	2,068,753	0.36%	7,406
Receivables from domestic sales of others	178,095	0.00%	–
Receivables from overseas sales of others	307	0.00%	–
	40,042,492		7,406

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 RMB0.46 million.

(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)*

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)	2,988,281	255,379
Within 1 year past due	–	–
1– 3 years past due	–	–
More than 3 years past due	40,842	40,266
	3,029,123	295,645

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.

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 2022 on a recurring basis.

	Level 1	Level 2	Level 3	Total
Recurring fair value measurements				
Assets				
Derivatives used for hedging (Note 13)		48,495	–	48,495
Other equity instrument investments (Note 10)	–	–	708,912	708,912
Total assets	–	48,495	708,912	757,407
Liabilities				
Derivatives used for hedging (Note 13)	–	662,850	–	662,850
Total liabilities	–	662,850	–	662,850

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

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 2022, 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.

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 2022:

	Valuation technique	Significant unobservable input	Range	Sensitivity of fair value to the input
Unlisted equity investments	Valuation multiples	Average P/B	2022: 1.14 to 1.25	10% increase/decrease in multiple would result in increase/decrease in fair value by RMB51.15 million.
		Discount for lack of marketability	2022: 18.05% to 19.85%	10% increase/decrease in multiple would result in decrease/increase in fair value by RMB11.27 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 2022 and 2021, there were no transfers of financial instruments between level 1 and level 2, or transfers into or out of level 3.

The movements during the year in the balance of the level 3 fair value measurements are as follows:

	2022	2021
Other equity instrument investments		
Beginning of the year	**722,205**	658,284
Addition	–	111,313
Disposal	–	(382)
Fair value changes	**(13,293)**	(47,010)
End of the year	**708,912**	722,205
Changes in fair value recognised in other comprehensive income for the year (net of tax)	**(9,971)**	(35,258)

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 RMB170.52 billion and RMB40.19 billion as at 31 December 2022 (2021: RMB153.82 billion and RMB36.79 billion), respectively. The aggregate book values of these liabilities were approximately RMB170.81 billion and RMB39.79 billion as at 31 December 2022 (2021: RMB154.07 billion and RMB36.57 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 2022, the strategy of the Group's capital management remained unchanged from 2021. The debt ratio of the Group as at 31 December 2022 was 73.58% (2021: 73.29% (restated)).

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 income tax assets

The Group recognises the deferred income 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 income 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.

(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 2022	PRC power segment	Overseas segment Note i	All other segments	Inter-segment revenue	Total
– Sales of power and heat	207,923,505	28,167,697	–	–	236,091,202
– Sales of coal ash, coal and raw materials	1,763,278	1,640	–	–	1,764,918
– Port service	–	–	605,072	(346,149)	258,923
– Transportation service	–	–	228,019	(183,609)	44,410
– Lease income	108,211	1,220,675	–	–	1,328,886
– Others	2,444,212	4,781,394	31,421	(20,577)	7,236,450
Total	212,239,206	34,171,406	864,512	(550,335)	246,724,789
Revenue:					
– From contracts with customers within the scope of IFRS 15					245,395,903
– From other sources					1,328,886

For the year ended 31 December 2021 (Restated)	PRC power segment	Overseas segment Note i	All other segments	Inter-segment revenue	Total
– Sales of power and heat	178,688,230	15,437,421	–	–	194,125,651
– Sales of coal ash, 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	183,092,218	21,577,832	1,426,554	(1,017,107)	205,079,497
Revenue:					
– From contracts with customers within the scope of IFRS 15					203,606,098
– From other sources					1,473,399

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 ash, 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.

(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 2022				
Total revenue	212,239,206	34,171,406	864,512	247,275,124
Intersegment revenue	–	–	(550,335)	(550,335)
External revenue	212,239,206	34,171,406	314,177	246,724,789
Segment results	(12,554,462)	2,493,091	520,002	(9,541,369)
Interest income	203,093	133,871	2,294	339,258
Interest expense	(8,892,309)	(934,676)	(125,096)	(9,952,081)
Impairment loss	(2,726,262)	(5,834)	–	(2,732,096)
Credit loss	46,465	(94,722)	–	(48,257)
Depreciation and amortisation	(22,916,308)	(684,862)	(260,314)	(23,861,484)
Net gain/(loss) on disposal of non-current assets	164,415	(585)	(4)	163,826
Share of profits less losses of associates and joint ventures	423,159	–	522,934	946,093
Income tax expense	(26,205)	(335,157)	(20,844)	(382,206)

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 2021 (Restated)				
Total revenue	183,092,218	21,577,832	1,426,554	206,096,604
Intersegment revenue	–	–	(1,017,107)	(1,017,107)
External revenue	183,092,218	21,577,832	409,447	205,079,497
Segment results	(15,446,192)	954,815	590,003	(13,901,374)
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	(20,811,625)	(600,029)	(224,634)	(21,636,288)
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	200,606	–	483,532	684,138
Income tax expense	1,667,483	(42,726)	(21,043)	1,603,714

(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 2022				
Segment assets	438,449,391	44,394,771	10,779,389	493,623,551
Including:				
Additions to non-current assets (excluding financial assets and deferred income tax assets)	44,492,820	240,565	53,207	44,786,592
Investments in associates	14,748,090	–	5,320,368	20,068,458
Investments in joint ventures	1,208,183	–	1,145,430	2,353,613
Segment liabilities	(344,746,791)	(27,166,963)	(2,015,618)	(373,929,372)

	PRC power segment	Overseas segment	All other segments	Total
31 December 2021 (Restated)				
Segment assets	430,420,907	40,378,092	10,938,171	481,737,170
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	14,030,470	–	4,995,904	19,026,374
Investments in joint ventures	1,346,963	–	1,151,581	2,498,544
Segment liabilities	(337,445,709)	(23,857,688)	(2,655,232)	(363,958,629)

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	
	2022	2021 (Restated)
External revenue (PRC GAAP)	**246,724,789**	205,079,497
Operating revenue per IFRSs consolidated statement of comprehensive income	**246,724,789**	205,079,497

A reconciliation of segment results to profit before income tax expense is provided as follows:

	For the year ended 31 December	
	2022	2021 (Restated)
Segment results (PRC GAAP)	**(9,541,369)**	(13,901,374)
Reconciling items:		
Loss related to the headquarters	**(287,484)**	(309,414)
Share of profits of Huaneng Finance	**125,340**	188,956
Dividend income of other equity instrument Investments	**832**	1,743
Impact of IFRSs adjustments*	**(1,111,276)**	(843,505)
Loss before income tax expense per IFRSs consolidated statement of comprehensive income	**(10,813,957)**	(14,863,594)

(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	
	2022	2021 (Restated)
Total segment assets (PRC GAAP)	**493,623,551**	481,737,170
Reconciling items:		
Investment in Huaneng Finance	**1,476,326**	1,426,986
Deferred income tax assets	**6,322,055**	5,503,847
Prepaid income tax	**124,575**	695,156
Other equity instrument investments	**708,912**	729,070
Corporate assets	**350,560**	254,442
Impact of IFRSs adjustments*	**9,615,794**	10,702,739
Total assets per IFRSs consolidated statement of financial position	**512,221,773**	501,049,410

Reportable segment liabilities are reconciled to total liabilities as follows:

	As at 31 December	
	2022	2021
Total segment liabilities (PRC GAAP)	**(373,929,372)**	(363,958,629)
Reconciling items:		
Current income tax liabilities	**(331,928)**	(227,880)
Deferred income tax liabilities	**(1,086,765)**	(900,885)
Corporate liabilities	**(713,863)**	(1,089,086)
Impact of IFRSs adjustments*	**(843,786)**	(1,036,730)
Total liabilities per IFRSs consolidated statement of financial position	**(376,905,714)**	(367,213,210)

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 IFRSs adjustments*	Total
For the year ended 31 December 2022					
Total revenue	**246,724,789**	**–**	**–**	**–**	**246,724,789**
Interest expense	**(9,952,081)**	**(10,044)**	**–**	**–**	**(9,962,125)**
Depreciation and amortisation	**(23,861,484)**	**(51,809)**	**–**	**(574,549)**	**(24,487,842)**
Impairment loss	**(2,732,096)**	**–**	**–**	**(396,086)**	**(3,128,182)**
Credit loss	**(48,257)**	**–**	**–**	**–**	**(48,257)**
Share of profits less losses of associates and joint ventures	**946,093**	**–**	**125,340**	**(29,325)**	**1,042,108**
Net gain on disposal of non-current assets	**163,826**	**–**	**–**	**(34,989)**	**128,837**
Income tax expense	**(382,206)**	**–**	**–**	**223,548**	**(158,658)**
For the year ended 31 December 2021 (Restated)					
Total revenue	205,079,497	–	–	–	205,079,497
Interest expense	(8,785,995)	(12,205)	–	–	(8,798,200)
Depreciation and amortisation	(21,636,288)	(50,986)	–	(657,674)	(22,344,948)
Impairment loss	(89,094)	–	–	(2,543)	(91,637)
Credit loss	(103,625)	–	–	–	(103,625)
Share of profits less losses of associates and joint ventures	684,138	–	188,956	(24,994)	848,100
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

* IFRSs 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.

(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	
	2022	2021 (Restated)
PRC	**212,553,383**	183,501,665
Overseas	**34,171,406**	21,577,832
Total	**246,724,789**	205,079,497

The geographical locations of customers are based on the locations 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	
	2022	2021 (Restated)
PRC	**386,751,134**	371,522,589
Overseas	**22,586,601**	22,087,875
Total	**409,337,735**	393,610,464

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 2022, the revenue from grid companies under common control of State Grid Corporation of China within the PRC power segment in total accounted for 78% of external revenue (2021: 70%). 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			
	2022		2021	
	Amount	**Proportion**	Amount (Restated)	Proportion (Restated)
State Grid Shandong Electric Power Company	**37,348,460**	**15%**	30,400,186	15%

5 REVENUE AND SEGMENT INFORMATION *(Cont'd)*

(c) Contract assets and liabilities

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 RMB323 million (2021: RMB324 million) at the beginning of the year has been recognised as revenue of heating pipeline service in 2022. The contract liabilities of RMB2,712 million (2021: RMB2,199 million) at the beginning of the year has been recognised as revenue of heat sales in 2022.

(i) The transaction prices allocated to remaining performance obligations (unsatisfied or partially unsatisfied) are as follows:

	As at 31 December	
	2022	2021
Within 1 year	**148,671**	208,668
Over 1 year	**3,966,404**	2,685,875
Total (Note 26)	**4,115,075**	2,894,543

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 2022 that have an original expected duration of one year or less.

(Amounts expressed in thousands of RMB unless otherwise stated)

6 LOSS BEFORE INCOME TAX EXPENSE

Loss before income tax expense was determined after charging/(crediting) the following:

	For the year ended 31 December	
	2022	2021 (Restated)
Total interest expense on borrowings	**10,955,940**	10,096,884
Less: amounts capitalised in property, plant and equipment	**993,815**	1,298,684
Interest expense charged to the consolidated statement of comprehensive income	**9,962,125**	8,798,200
Including: Interest expense on lease liabilities	**298,798**	169,696
Depreciation of property, plant and equipment	**23,372,667**	21,495,686
Depreciation of investment properties	**21,791**	30,162
Depreciation of right-of-use assets	**985,746**	749,383
	24,380,204	22,275,231
Included in other investment gain		
– Dividends on other equity instrument investments	**832**	1,743
– Other	**4,606**	5,772

6 LOSS BEFORE INCOME TAX EXPENSE *(Cont'd)*

	For the year ended 31 December	
	2022	2021 (Restated)
Included in other operating expenses:		
– Operating expense of Ruyi Pakistan Energy	**4,612,008**	3,943,171
– Service concession construction cost	**89,048**	148,578
– Other materials expense	**1,641,319**	1,611,493
– Electricity charges	**758,112**	1,109,709
– Cost of sales of raw materials	**631,590**	1,125,710
– Water charges	**594,212**	617,595
– Insurance expense	**490,155**	413,985
– Cleaning, greening and fire protection expense	**434,833**	440,704
– Purchase of power generation quota	**708**	231,233
– Transportation allowance	**194,367**	190,532
– Pollutant charge	**127,015**	98,037
– Water conservancy fund and disabled security fund	**107,873**	92,199
– Test and inspection expense	**343,754**	341,511
– Service charge	**545,375**	335,874
– Heating pipeline related cost	**158,520**	159,990
– Auditors' remuneration-audit services	**40,326**	32,996
– Other consulting expense	**161,004**	114,361
– Office expense	**278,921**	276,561
– Minimum lease payments under operating leases, lease payments not included in the measurement of lease liabilities	**327,002**	114,909
– Amortisation of other non-current assets	**107,638**	69,717
– Property management expense	**138,110**	99,561
– Information technology maintenance expense	**254,415**	245,027
– Travel expense	**90,300**	128,458
– Business entertainment expense	**34,318**	39,678
– Research and development expenditure	**1,607,847**	1,324,735
– Net loss on disposal of materials and supplies	**185**	13,575
– Net gain on disposal of non-current assets	**(128,837)**	(520,878)
– Recognition/(reversal) of provision for inventory obsolescence (Note 16)	**6,486**	(242)
– Impairment loss on property, plant and equipment	**1,823,978**	28,879
– Impairment loss on goodwill	**897,524**	–
– Impairment loss on other non-current assets*	**400,194**	63,000
– Gain on Three Supplies and Property Management	**(139,094)**	(36,835)
– Government grants**	**(1,722,363)**	(2,013,149)
– Penalties	**10,113**	45,349
– Donations	**36,400**	37,707
– Others	**729,831**	709,052
Total	**15,683,187**	11,632,782

(Amounts expressed in thousands of RMB unless otherwise stated)

6 LOSS BEFORE INCOME TAX EXPENSE *(Cont'd)*

* In 2022, the Group recognised an impairment of RMB375 million for the investment in Huangtai #8 Power Plant.

** In 2022, the government subsidies related to income mainly include heat supply subsidy of RMB435 million (2021: RMB208 million), shutdown standby compensation of RMB389 million (2021: RMB707 million), thermal coal subsidy of RMB312 million (2021: RMB178 million), VAT reduction and rebate of RMB204 million (2021: RMB212 million), the post stabilization subsidy is RMB14 million (2021: RMB4 million) and the coal guarantee fund received by each company is RMB10 million (2021: RMB197 million).

7 PROPERTY, PLANT AND EQUIPMENT

	Dams	Port facilities	Buildings	Electric utility plant in service	Transportation facilities	Others	CIP	Total
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
Upon adoption of IAS 16	–	–	–	–	–	–	16,917	16,917
Cost (restated)	2,218,159	4,000,925	13,496,843	511,570,031	1,334,131	8,504,371	53,926,525	595,050,985
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	51,597,581	300,188,059
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
Upon adoption of IAS 16	–	–	–	–	–	–	16,917	16,917
Beginning of the year (restated)	1,355,745	2,910,291	8,027,086	232,500,981	725,346	3,071,029	51,597,581	300,188,059
Acquisition	–	–	14,518	328,410	–	20,590	–	363,518
Additions (restated)	–	–	40,337	1,033,297	100	111,166	41,439,412	42,624,312
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 (restated)	(37,251)	(127,260)	(581,157)	(20,230,603)	(67,660)	(481,280)	–	(21,525,211)
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 (restated)	1,322,885	2,757,093	9,499,672	253,088,243	670,760	3,360,203	50,121,023	320,819,879
As at 1 January 2022								
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
Upon adoption of IAS 16	–	–	–	219,790	–	–	15,274	235,064
Cost (restated)	2,222,549	3,973,839	15,716,208	549,679,065	1,352,671	9,152,056	50,121,023	632,217,411
Accumulated depreciation	(440,062)	(777,556)	(5,884,746)	(274,980,787)	(681,129)	(5,688,837)	–	(288,453,117)
Upon adoption of IAS 16	–	–	–	(4,810)	–	–	–	(4,810)
Accumulated depreciation (restated)	(440,062)	(777,556)	(5,884,746)	(274,985,597)	(681,129)	(5,688,837)	–	(288,457,927)
Accumulated impairment losses	(459,602)	(439,190)	(331,790)	(21,605,225)	(782)	(103,016)	–	(22,939,605)
Net book value (restated)	1,322,885	2,757,093	9,499,672	253,088,243	670,760	3,360,203	50,121,023	320,819,879

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 2022								
Beginning of the year (restated)	1,322,885	2,757,093	9,499,672	253,088,243	670,760	3,360,203	50,121,023	320,819,879
Acquisition	–	–	66,458	1,284,296	–	9,207	–	1,359,961
Additions	–	151	–	1,517,890	1,447	97,816	37,629,702	39,247,006
Transfer from CIP	–	6,969	483,609	43,672,179	9,272	456,482	(44,628,511)	–
Other additions	–	–	26,867	97,060	–	52,383	–	176,310
Reclassification to investment property	–	–	(4,111)	–	–	–	–	(4,111)
Disposals/write-off	–	–	(3,294)	(237,484)	(42)	1,479	–	(239,341)
Depreciation charge	(37,357)	(116,643)	(516,543)	(22,153,551)	(69,439)	(492,290)	–	(23,385,823)
Impairment charge	–	–	(42,614)	(1,769,329)	–	(7,882)	(4,153)	(1,823,978)
Reclassification	–	–	8,396	(26,239)	(223)	18,066	–	–
Other decrease	–	–	(63,352)	(512,115)	–	(3,798)	–	(579,265)
Currency translation differences	–	–	–	538,799	–	6,623	10,462	555,884
End of the year	1,285,528	2,647,570	9,455,088	275,499,749	611,775	3,498,289	43,128,523	336,126,522
As at 31 December 2022								
Cost	2,222,549	3,980,959	16,286,556	596,521,418	1,353,432	9,796,770	43,132,676	673,294,360
Accumulated depreciation	(477,419)	(894,199)	(6,440,023)	(297,442,573)	(740,875)	(6,188,936)	–	(312,184,025)
Accumulated impairment losses	(459,602)	(439,190)	(391,445)	(23,579,096)	(782)	(109,545)	(4,153)	(24,983,813)
Net book value	1,285,528	2,647,570	9,455,088	275,499,749	611,775	3,498,289	43,128,523	336,126,522

Interest capitalisation

Interest expense of approximately RMB994 million (2021: RMB1,299 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 3.56% (2021: 3.85%) per annum.

Security

As at 31 December 2022 and 2021, certain property, plant and equipment were pledged to banks as collateral for short-term loans (Note 30) and long-term loans (Note 24).

(Amounts expressed in thousands of RMB unless otherwise stated)

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Buildings without ownership certificates

At 31 December 2022, 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 RMB4,675 million (2021: RMB5,145 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

Note 1: Impairment of CGUs

For each CGU with indicator of impairment, the Group determine the recoverable amount based on the discounted future cash flow of the CGU and make provision for impairment of each CGU accordingly. In 2022, impairment losses of PPE amounting to RMB1,823 million were recognised, including RMB1,779 million of fixed assets for CGUs and RMB44 million for individual assets. The details are as follows:

	Net book value of CGUs after impairment (RMB million) 31 December 2022			Impairment recognised (RMB million) For the year ended 31 December		
Company name	Buildings	Power utility plant in service	Land use right and other assets included in CGUs	2022	2021	2020
Huaneng Liaocheng Co-generation Limited Company ("Liaocheng Co-generation") (a)	6	761	152	328	–	190
Huaneng Linyi Power Generation Limited Company ("Linyi Power") (a)	9	1,859	217	141	–	278
Huaneng Shandong Power Generation Co., Ltd. Baiyanghe Power Plant ("Baiyanghe Power Plant") (a)	33	763	133	184	–	465
Huaneng Power International Jiangsu Energy Development Co., Ltd. Nanjing Power Plant ("Nanjing Power Plant") (b)	14	573	25	294	–	–
Huaneng Power International Jiangsu Energy Development Co., Ltd. Nantong Power Plant ("Nantong Power Plant") (c)	153	333	11	411	–	–
Tianjin Huaneng Yangliuqing Co-generation Limited Liability Company ("Yangliuqing Co-generation") (d)	–	1,710	–	421	–	–
Total	215	5,999	538	1,779	–	933

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant

1) Background of CGUs that recognised impairment during the year

Liaocheng Co-generation operates 2x140MW and 2x330MW combined heat and power coal-fired generation units, with a total installed capacity of 940MW. The 2x140MW generation units commenced production in May and October 2003 respectively. The 2x330MW generation units commenced production in January and September 2006, respectively.

Linyi Power operates 4x140MW and 2x350MW combined heat and power coal-fired generation units, with a total installed capacity of 1,260MW. The 4x140MW generation units commenced production in December 1997, April 2003, September 2003 and April 2005 respectively. The 2x350MW generation units commenced production in December 2012 and October 2013 respectively.

Baiyanghe Power Plant operates 2x145MW and 2x300MW combined heat and power coal-fired generation units, with a total installed capacity of 890MW. 2x145MW generation units commenced production in September 2003,2x300MW generation units commenced production in December 2009.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant (Cont'd)

2) Reasons for impairment

Reasons for no impairment provisions in 2021:

Due to the sharp rise in fuel prices since the fourth quarter of 2021, Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant, the three power plants of Shandong Region began to suffer continuous losses, impairment indicators emerged, and impairment assessments were conducted as a result. The National Development and Reform Commission (the "NDRC") had introduced multiple relevant industry policies to ensure energy security. For example, in terms of tariff, in October 2021, the NDRC issued the *Circular on Further Stepping up the Market-oriented Reform of On-grid Tariffs for Coal-fired Power Generation* (NDRC Price [2021] No.1439) (hereinafter referred to as "Document No.1439"), which stipulated that all coal-fired power generation would, in principle, enter the electricity market, and the on-grid tariff would be formed through market transactions within the range of "benchmark tariff + floating range". The Circular stipulated that the fluctuation range of the market prices for the coal-fired powers would be adjusted from the current not more than 10% upward and not more than 15% downward to not more than 20% upward or downward, in principle, while high energy-consuming enterprises could break the 20% upward ceiling. And the spot price of electricity would be not limited by the above range. After the issuance of the document, certain provinces successively organized the first transaction at the end of 2021 after the marketization reform of on-grid tariffs for coal-fired power generation. Among them, a total of 49 coal-fired power generation enterprises,79 retail electricity companies and 5 power users participated in the transaction in Shandong province, with a total transaction volume of 11.07 billion kWh and the average transaction price being 19.8% higher than the benchmark tariff. In terms of fuel prices, the NDRC issued the Circular on Further Improving the Coal Market Price Formation Mechanism in February 2022 (NDRC Price [2022] No.303) (hereinafter referred to as "Document No.303"), aiming to guide the price of coal (thermal coal, similarly hereinafter) to operate within a reasonable range, and improve the price transmission mechanism between coal prices and electricity prices, specifying that the reasonable range of the medium and long-term trading prices of thermal coal (5500 kcal) at Qinhuangdao Port was adjusted from the previous floating price of RMB535/ton to the range of about RMB570/ton to RMB770/ton. The Document No.303 also aimed to guide the formation of coal prices and on-grid tariffs through the way of medium and long-term transactions and encouraged to set reasonable terms on on-grid electricity tariff in medium and long-term electricity transaction contracts, so as to form price linkage between electricity tariff and coal prices in the medium and long-term contracts, achieving the effectively transmission between coal prices and electricity tariffs. And also aimed to improve the ability to adjust supply and demand in the coal market, to further improve the coal production, supply, storage and marketing system, to ensure reasonable and sufficient coal production capacity, to improve the medium and long-term contract system for coal, to further enhance the government's ability to dispatch and store coal, and to improve the reserve adjustment mechanism by timely storage and circulation of coal so as to promote the operation of coal prices within a reasonable range. At the same time, it also improved the fuel prices regulation mechanism and took measures to guide fuel prices back to a reasonable range when significant price fluctuations occur.

In conclusion, the Company estimated the operating performance in the coming years would be greatly improved compared with that in 2021, and through impairment assessment, no impairment loss was recognised for the year ended 31 December 2021.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant (Cont'd)

2) Reasons for impairment *(Cont'd)*

Reasons for impairment provisions in 2022:

In 2022, the government paid more attention to the work of security of energy supply, and successively introduced a series of policies and measures to ensure supply security and price stability of thermal coal. Reasonable coal prices of medium and long- term coal contracts were specified in Document No.303 issued in February 2022. Authorities also proposed to implement Price Law to regulate and control market prices of coal; to further strengthen the signing, performance, and supervision of medium and long-term contracts for thermal coal, aiming to achieve the realization of the "Three 100%", namely,100% coverage rate of medium and long-term thermal coal contracts to cover annual coal consumption amount by power generation and heating supply companies; 100% monthly performance rate of medium and long-term thermal coal contracts, and 100% implementation rate of medium and long-term thermal coal contract price policies. Meanwhile, restrictive policies for coal production, such as "Coal ticket management policy" was cancelled in some main production areas of coal, such as Yulin, Shaanxi and Ordos, Inner Mongolia, promoting the further release of advanced domestic production capacity. The above policies and measures have played a positive role in promoting the rational return of coal prices.

However, affected by multiple factors, international coal market demonstrated tight supply, resulting in significant reductions in imported coal and significant increase in coal price. Besides, the increase of domestic coal supply was less than expected, resulting in the continuing high-level operation of coal prices. In 2022, according to China Electricity Coal Index (CECI), average index price of the 5500 kcal thermal coal amounted to RMB1,296/ton, representing an increase of 24.2% as compared with that of last year. Fuel procurement cost increased significantly for the coal fired power generation enterprises, and the aforementioned three coal fired power plants realized continued significant losses.

In addition, according to the *Circular on Further Improving the Work Related to the Elimination of Outdated Coal Power Generation Units in 2022 Through "First Establishing and Then Rectifying"* (Lu Energy Power [2022] No.196) by Shandong Energy Bureau on 22 December 2022, No.4 and No.5 generation units of Baiyanghe Power Plant were converted to standby power supply units for emergencies in 2022. After conversion, the forecasted power generation hours decreased compared with the actual power generation hours in 2022.

(Amounts expressed in thousands of RMB unless otherwise stated)

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant (Cont'd)

3) Assumptions of impairment assessment

In 2022, the Company conducted impairment assessment of the above mentioned three CGUs. The key assumption parameters used in estimating the recoverable amount of the CGUs include future sales volume (power generation hours) and fuel prices. Other main assumption parameters applied in the impairment assessment also contain average tariff. Key assumption parameters are listed in the following table:

	Sales volume (power generation hours) Unit: hours/year		Tariff (excluding tax) Unit: RMB/MWh		Fuel prices (price of standard coal into the furnace) Unit: RMB/ton	
Company name	Forecast period	Actual in 2022	Forecast period	Actual in 2022	Forecast period	Actual in 2022
Liaocheng Co-generation	4,090	4,344	2023: 441.77 2024: 422.96 2025: 404.15 2026: 385.34 2027 and afterwards: 366.52	443.75	2023: 1,103.33 2024: 989.27 2025: 887.00 2026: 795.30 2027 and afterwards: 713.08	1,238.99
Linyi Power	3,900	4,122	2023: 446.90 2024: 429.79 2025: 412.69 2026: 395.58 2027 and afterwards: 378.47	451.11	2023: 1,136.21 2024: 1,056.42 2025: 976.62 2026: 896.83 2027 and afterwards: 817.03	1,355.05
Baiyanghe Power Plant	3,420	3,767	2023: 441.59 2024: 440.88 2025: 423.10 2026: 405.85 2027 and afterwards: 389.64	469.85	2023: 1,087.09 2024: 986.73 2025: 895.64 2026: 812.95 2027 and afterwards: 737.90	1,231.64

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant (Cont'd)

3) Assumptions of impairment assessment *(Cont'd)*

Sales volume (power generation hours):

The Company estimated the power generation hours in the forecast period based on the market condition, the relevant power trading policies and the efficiency of power generation units. According to the "*14th Five-Year Plan*" of Electrical Power Development in Shandong Province, the incremental electricity consumption of the whole society in Shandong Province during the forecast period shall demonstrate an annual incremental rate of about 4.1% per annum. Although the proportion of coal-fired power generation in the total social power generation was expected to decrease from 68.5% in 2020 to 59% in 2025, the total installation of coal-fired power generation in 2025 will still demonstrate an upward trend compared to 2020. Meanwhile, according to the "*14th Five-Year Plan*" of Electrical Power Development in Shandong Province, by 2025, the total installed coal-fired capacity shall be kept around 100,000 Mw, which was expected to remain basically unchanged with the installation amount of 103,000 Mw in year 2020. Therefore, the incremental electricity consumption in Shandong Province can compensate for the influence of incremental installation capacity from new energy power plants and power supply from outside the province, thus coal-fired power units can maintain stable power generation hours during the forecast period. As a result, the power generation hours of the above mentioned three power plants were expected to maintain stable average utilization hours during the forecast period.

The forecasted power generation hours of Liaocheng Co-generation and Linyi Power slightly decreased compared with the actual power generation hours in 2022, mainly due to the following reasons: during year 2022, for the factors of 1) the incremental electricity consumption in Shandong Province and 2) the output of wind power, photovoltaic power and hydropower was less than expected, the power generation hours of coal-fired power units remained at a high level to ensure sufficient power supply. With the disappear of the influencing factors in the future, power generation hours of coal-fired generation units were expected to return to normal level during the forecast period. The power generation hours of Baiyanghe Power Plant are 3,420 hours during the forecast period, representing a decrease of 347 hours compared with the actual power generation hours of 3,767 hours in 2022, which is mainly affected by the conversion of No.4 and No.5 generation units into standby power supply units for emergencies in 2023, according to the aforementioned Lu Energy Power [2022] No.196.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant (Cont'd)

3) Assumptions of impairment assessment *(Cont'd)*

Tariff:

Based on relevant national policies and regional electricity trading policies, the Company estimated the average tariff in the forecast period with reference to the current tariff level and the floating range of benchmark tariff. Referring to the terms in Document No.303 that encouraged to set reasonable terms on on-grid electricity tariff in medium and long-term electricity transaction contracts, so as to form price linkage between electricity tariff and coal prices in the medium and long-term contracts, achieving the effectively transmission between coal prices and electricity tariffs, and with the gradual return of fuel prices, the Company forecasted that future tariff will gradually decline on current basis to a reasonable range.

Fuel prices (price of standard coal into the furnace):

The Company estimated the fuel prices in the forecast period based on the coal's source structure, supply and demand situation, as well as the relevant industry policies.

Domestic coal prices remained at a high level in 2022. In the first half of the year, the average price of 5500 kcal thermal coal in Qinhuangdao port was about RMB1,200/ton; from August to September, impacted by extreme weather of high temperature and drought and continuous weakening of the output of hydroelectricity, coal prices continued to rise. And the upward trend continued in October. Later on, with the coal supply input at the port increased, overlying overseas coal prices went down and industrial coal demand weakened, coal prices fell back from peak, the price of 5500 kcal thermal coal in Qinhuangdao port fell to about RMB1,200/ton by December 2022. For the whole year of 2022, average price index of 5500 kcal thermal coal in CECI was RMB1,296/ton, demonstrating an increase of 24.2% as compared with that of last year.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant (Cont'd)

3) Assumptions of impairment assessment *(Cont'd)*

The coal prices mentioned above were much higher than the rational price range of RMB570-770/ton specified in Document No.303. Management expected that the price of thermal coal will gradually return to the above rational range in the long run for the following reasons:

a) In terms of coal supply, from the perspective of the current market and policy environment, the safe and stable supply of energy in line with national conditions has been coming under increasing attention. With the approval of the capacity increase of coal production and the intensity of the putting into production of new coal mines kept unchanged, the capacity and output of coal will be both enhanced, and the supply capacity of coal will increase in the future. Among the major coal producing provinces, Shanxi Province has a target output of 1.365 billion tons in 2023, representing a year-on-year increase of 57.85 million tons, Shaanxi Province has a target output of 750 million tons in 2023 representing a year-on-year increase of 3.96 million tons, Inner Mongolia Autonomous Region has a target output of 1.25 billion tons in 2023 representing a year-on-year increase of 75.9 million tons, and Xinjiang Uygur Autonomous Region plans to scale up 8 million tons of external transmission of coal and 6 billion kWh of external power transmission in 2023 (equivalent to about 10.7 million tons of coal in total). It was estimated that the total output of the four provinces of Shanxi, Shaanxi, Inner Mongolia and Xinjiang will increase by 150 million tons. Meanwhile, according to the latest statistics published by General Administration of Customs of the People's Republic of China on 7 March imported coal and brown coal were 60.642 million tons from January to February 2023, demonstrating an increase of 25.144 million tons or a year-on-year increase of 70.8%. The increase of imported coal ensures the supply level of domestic coal market.

b) In terms of coal consumption, although coal fired power generation units being treated as ballast stones has been valued gradually, the growth rate of coal consumption will be restrained under the trend of rapid development of clean energy. According to Modern Energy System Plan of 14th Five-Year Plan issued by NDRC and National Energy Administration on 29 January 2022, the growth of coal consumption will be strictly controlled, and according to the "Glasgow Joint Declaration between China and the United States on Intensifying Climate Action in the 2020s" released by China and the United States during the United Nations Climate Change Conference in Glasgow, during the period of the "15th Five-Year Plan", coal consumption will be reduced gradually. In the context of increased supply and controlled consumption, the relationship between coal's supply and demand will be gradually improved.

c) In recent years, authorities had implemented a series of policies to ensure supply and stabilize prices of coal market. For example, by expanding coverage of medium and long-term coal contracts and strengthening the supervision and inspection of the implementation of medium and long-term coal contracts, it was expected to promote rational coal prices return.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(a) The three subsidiaries of Shandong Region: Liaocheng Co-generation, Linyi Power, and Baiyanghe Power Plant (Cont'd)

3) Assumptions of impairment assessment *(Cont'd)*

The Company took a holistic view on factors such as the implementation period of the aforementioned national policies, and the time for the commencement of the operation of the newly increased coal production capacities, combining factors such as the coal consumption structure, coal sources, and transportation modes of individual power plants, and estimated that even though there may be repeated imbalances between the relationship of coal supply and demand, expecting that coal prices would gradually fall from the current high level to the rational range as specified in Document No.303.

With regard to the coal prices in the long run, the Company reckoned that the domestic coal market can achieve a balanced supply and demand in the future. The under-supply that emerged since the end of 2021 will be levelled. According to the statistics, there existed a strong correlation and fitting degree between the historical price trend of thermal coal in various regions of the Company in the past decade and the price index of Qinhuangdao port thermal coals (5500 kcal) in the past decade. From the perspective of a longer period, the coal in the past decade have experienced a period that featured the combination of relatively loose supply and relatively tight supply. As coal prices are intricate and are subject to periodic fluctuation, the Company was therefore of the view that the average 10-year coal procurement prices of power plants in each region are acceptable for both upstream and downstream of the coal supply chain. Therefore, the forecasted long-term coal prices were based on the average 10-year historical coal procurement prices of individual power plant, and adjusted according to factors futured to each power plant, such as coal quality requirements, transportation modes, and transportation distance.

In 2022, the recoverable amounts were determined based on the discounted future cash flow of the 3 CGUs (Liaocheng Co-generation, Linyi Power and Baiyanghe Power Plant) using the assumption parameters above, and RMB653 million and RMB722 million impairment losses of PPE and goodwill were recognised in total. The Company engaged Beijing Tianjian Xingye Asset Evaluation Co., Ltd., an independent appraiser, to independently estimate the recoverable amount of above CGUs, and valuation reports on the impairment assessment of CGUs and goodwill of Liaocheng Co-generation and Linyi Power were issued.

(b) Nanjing Power Plant

Nanjing Power Plant is located in Liuhe District, Nanjing, Jiangsu Province, which operates two 320MW coal-fired units (i. e., No.1 and No.2 generation units) which commenced operation in March 1994 and October 1994 respectively. In 2021 and 2022, Nanjing Power Plant realized operating losses of RMB254 million and RMB260 million respectively, recording significant losses (profitable in 2020) for two consecutive years, impairment indicators thus emerged.

Meanwhile, according to *Reply on Approval of Huaneng Nantong (Tongzhou Bay) 2×1000 MW Large Clean and Efficient Coal Power Project* (Sufagai Energy Development [2022] No.1247) issued by Jiangsu Development & Reform Commission on 28 October 2022, No.1 and No.2 generation units of Nanjing Power Plant, which are capacity substitution generation units, should be shut down as required. Management expects to shut down these two units after the expiration of the Power Generation Licenses in March and October 2024 respectively.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

***(b) Nanjing Power Plant** (Cont'd)*

In 2022, the Company conducted impairment assessment of the above mentioned CGU. Key assumption parameters used in estimating the recoverable amount include future sales volume (power generation hours) and fuel prices. Other assumption parameters applied in the impairment assessment mainly include the average tariff. Key assumption parameters are listed in the following table:

	Sales volume (power generation hours) Unit: hours/year		Tariff (excluding tax) Unit: RMB/MWh		Fuel prices (price of standard coal into the furnace) Unit: RMB/ton	
Company name	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**
Nanjing Power Plant	2023: 4,500 2024: 3,625	5,368	2023: 413.38 2024: 413.38	408.24	2023: 1,211.45 2024: 1,073.11	1,309.19

Sales volume (power generation hours):

The Company estimated the power generation hours in the forecast period based on the market condition and the relevant power trading policies. Based on the contractual long-term market power and the power generation of the units to ensure heating service during the winter heating periods, the Company estimated that the power generation hours in 2023 is 4,500 hours. No.1 and No.2 generation units will be shut down successively, with the expiration of corresponding Power Generation Licenses in March 2024 and October 2024, respectively. Therefore, the power generation hours in 2024 will continue to decrease on the basis of 2023, to the amount of about 3,625 hours.

The power generation hours in the forecast period have decreased compared with the actual power generation hours in 2022, mainly due to the following reasons: in 2022, due to the economic resurgence in Nanjing and continuous exposure to high temperature weather of above 40˚C, the power consumption of the whole city in Nanjing reached a year-on-year increase of 4.43%, in addition, the maintenance time of other power plants' generation units in the same area was extended, as a result, the power generation hours of Nanjing Power Plant increased significantly throughout 2022 (2021: 3,274 hours).

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(b) Nanjing Power Plant *(Cont'd)*

Tariff:

Based on relevant national policies and regional electricity trading policies, the Company estimated the average tariff in the forecast period with reference to the current tariff level and the floating range of benchmark tariff. Referring to the terms in Document No.303 that encouraged to set reasonable terms on on-grid electricity tariff in medium and long-term electricity transaction contracts, so as to form price linkage between electricity tariff and coal prices in the medium and long-term contracts, achieving the effectively transmission between coal prices and electricity tariffs. And with the gradual return of fuel prices, management forecasted that future tariff will gradually decline on current basis to a reasonable range.

Meanwhile, considering the influence of the tense supply and demand relationship of coal, coal price was expected to remain at high level in the short run, which will exceed the price ceiling specified in Document No. 303. Therefore, the Company forecasted that tariff of 2023 and 2024 will maintain the same floating range with that of 2022.

Fuel prices (price of standard coal into the furnace):

The Company estimated the fuel prices in the forecast period based on the coal's source structure, supply and demand situation, as well as the relevant industry policies.

As mentioned earlier in part a), fuel prices (price of standard coal into the furnace), the implementation period of the aforementioned national policies, and the time for the commencement of the operation of the newly increased coal production capacities, combining factors such as the coal consumption structure, coal origins, and transportation modes of individual power plants, and estimates that there may be repeated imbalances between the relationship of coal supply and demand, thus expecting that coal prices would gradually fall from the current high level to the rational range as specified in Document No.303.

Management therefore estimated that the coal prices will fall in 2023 and 2024, but the prices will remain at a high level. Considering the actual prices of coal purchases of power plants in 2022 and signing and performance of medium and long-term contracts, management estimated that the unit price of standard coal into the furnace in 2023 and 2024 would be RMB1,211.45/ton and RMB1,073.11/ton, respectively.

In 2022, the recoverable amount was determined based on the discounted future cash flow of the CGUs using the assumption parameters above and RMB294 million impairment loss of PPE was recognised. The Company engaged Beijing Tianjian Xingye Asset Evaluation Co., Ltd., an independent appraiser, to independently estimate the recoverable amount of the above CGU, and a valuation report on the impairment assessment of CGU was issued.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(c) Nantong Power Plant

Nantong Power Plant is located in Nantong, Jiangsu province, which operates two 350 Mw coal-fired generation units ("No.3 and No.4"), which commenced operation in April 1999 and July 1999 respectively. In 2021 and 2022, Nantong Power Plant realized net losses of RMB280 million and RMB401 million respectively, recording significant losses (profitable in 2020) for two consecutive years, impairment indicators thus emerged.

In 2022, the Company conducted impairment assessment of the above mentioned CGU. Key assumption parameters used in estimating the recoverable amount include future sales volume (power generation hours) and fuel prices. Other assumption parameters applied in the impairment assessment mainly include the average tariff. Key assumption parameters are listed in the following table.

	Sales volume (power generation hours) Unit: hours/year		Tariff (excluding tax) Unit: RMB/MWh		Fuel prices (price of standard coal into the furnace) Unit: RMB/ton	
Company name	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**
Nantong Power Plant	2023-2028: 4,429 2029: 2,354	4,401	2023: 429.00 2024: 408.85 2025: 391.15 2026: 378.76 2027 and afterwards: 369.20	443.02	2023: 1,070.91 2024: 1,002.73 2025: 934.55 2026: 866.37 2027 and afterwards: 798.20	1,213.21

Sales volume (power generation hours):

The Company estimated the power generation hours in the forecast period based on the market condition and the relevant power trading policies. Considering expected growth of social electricity consumption, electricity market trading rules as well as the incremental capacity of newly installed clean energy, the annual power generation hours were predicted to be maintained at 4,429 hours. In 2029, affected by the shutdown of No.3 and No.4 generation units with the expiration of corresponding Power Generation Licenses, it was predicted that the annual average power generation hours will be 2,354 hours.

For the forecast period from 2023 to 2029, the power generation hours were expected to be 4,429 hours, representing an increase of 28 hours compared with the actual hours in 2022. The main reason is that with the disappearance of the influence of some damage factors on engine blade of No.3 generation unit, power generation hours were expected to increase on year-on-year basis.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(c) Nantong Power Plant (Cont'd)

Tariff:

Based on relevant national policies and regional electricity trading policies, the Company estimated the average tariff in the forecast period with reference to the current tariff level and the floating range of benchmark tariff. Referring to the terms in Document No.303 that encouraged to set reasonable terms on on-grid electricity tariff in medium and long-term electricity transaction contracts, so as to form price linkage between electricity tariff and coal prices in the medium and long-term contracts, achieving the effectively transmission between coal prices and electricity tariffs. And with the gradual return of fuel prices, management forecasted that future tariff will gradually decline on current basis to a reasonable range.

Fuel prices (Price of standard coal into the furnace):

The Company estimated the fuel prices in the forecast period based on the coal's source structure, supply and demand situation, as well as the relevant industry policies.

As mentioned earlier in part a), Fuel prices (price of standard coal into the furnace), the implementation period of the aforementioned national policies, and the time for the commencement of the operation of the newly increased coal production capacities, combining factors such as the coal consumption structure, coal origins, and transportation modes of individual power plants, and estimates that there may be repeated imbalances between the relationship of coal supply and demand, thus expecting that coal prices would gradually fall from the current high level to the rational range as specified in Document No.303.

With regard to the coal prices in the long run, the Company reckoned that the domestic coal market can achieve a balanced supply and demand in the future. The under-supply that emerged since the end of 2021 will be levelled. According to the statistics, there existed a strong correlation and fitting degree between the historical price trend of thermal coal in various regions of the Company in the past decade and the price index of Qinhuangdao port thermal coals (5500 kcal) in the past decade. From the perspective of a longer period, the coal in the past decade have experienced a period that featured the combination of relatively loose supply and relatively tight supply. As coal prices are intricate and are subject to periodic fluctuation, the Company was therefore of the view that the average 10-year coal procurement prices of power plants in each region are acceptable for both upstream and downstream of the coal supply chain. Therefore, the forecasted long-term coal price was based on the average 10-year historical coal procurement prices of Nantong Power Plant, with the expectation that the coal price will fall gradually to RMB798.20/ton.

In 2022, the recoverable amount was determined based on the discounted future cash flow of the CGU using the assumption parameters above and RMB411 million impairment loss of PPE was recognised. The Company engaged Beijing Tianjian Xingye Asset Evaluation Co., Ltd., an independent appraiser, to independently estimate the recoverable amount of the above CGU, and a valuation report on the impairment assessment of CGU was issued.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(d) Yangliuqing Co-generation

Yangliuqing Co-generation operates four 300 MW power and heat co-generation units ("No.5, No.6, No.7 and No.8"), which commenced operations in December 1998, September 1999, December 2006 and May 2007 respectively. In 2021 and 2022, Yangliuqing Co-generation realized net operating losses of RMB516 million and RMB597 million, respectively, recording significant losses (profitable in 2020) for two consecutive years, impairment indicators thus emerged.

In 2022, Yangliuqing Co-generation conducted impairment assessment of the above-mentioned CGU. The key assumption parameters used in estimating the recoverable amount include future sales volume (power generation hours) and fuel prices. Other assumption parameters applied in the impairment assessment mainly include the average tariff. Key assumption parameters are listed in the following table:

	Sales volume (power generation hours) Unit: hours/year		Tariff (excluding tax) Unit: RMB/MWh		Fuel prices (price of standard coal into the furnace) Unit: RMB/ton	
Company name	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**
YangLiuqing Co-generation	4,297	3,995	2023: 405.31 2024: 400.04 2025: 394.44 2026: 388.92 2027 and afterwards: 362.83	412.56	2023: 1,055.00 2024: 970.00 2025: 840.00 2026: 710.00 2027 and afterwards: 672.89	1,107.06

Sales volume (power generation hours):

The Company estimated the power generation hours in the forecast period based on the market condition and the relevant power trading policies.

Based on the contractual long-term market power and the power generation of the units to ensure heating service during the winter heating periods, the Company estimated that the power generation hours in 2023 are 4,297 hours, increased by 302 hours compared with the actual power consumption in 2022. The increase is mainly due to the facts that electricity consumption of the whole society and the winter heating area in Tianjin were expected to increase.

The Company forecasted power generation hours will maintain 4,297 hours in the future, which is comparable to the average utilization hours over the past two years (2020: 4,245 hours, 2021: 4,451 hours).

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 1: Impairment of CGUs *(Cont'd)*

(d) Yangliuqing Co-generation *(Cont'd)*

Tariff:

Based on relevant national policies and regional electricity trading policies, the Company estimated the average tariff in the forecast period with reference to the current tariff level and the floating range of benchmark tariff. Referring to the terms in Document No.303 that encouraged to set reasonable terms on on-grid electricity tariff in medium and long-term electricity transaction contracts, so as to form price linkage between electricity tariff and coal prices in the medium and long-term contracts, achieving the effectively transmission between coal prices and electricity tariffs. and with the gradual return of fuel prices, management forecasted that future tariff will gradually decline on current basis to a reasonable range.

Fuel prices (price of standard coal into the furnace):

The Company estimated the fuel prices in the forecast period based on the coal's source structure, supply and demand situation, as well as the relevant industry policies.

As mentioned earlier in part a), fuel prices (price of standard coal into the furnace), the implementation period of the aforementioned national policies, and the time for the commencement of the operation of the newly increased coal production capacities, combining factors such as the coal consumption structure, coal origins, and transportation modes of individual power plants, and estimates that there may be repeated imbalances between the relationship of coal supply and demand, thus expecting that coal prices would gradually fall from the current high level to the rational range as specified in Document No.303.

With regard to the coal prices in the long run, the Company reckons that the domestic coal market can achieve a balanced supply and demand in the future. The under-supply that emerged since the end of 2021 will be levelled. According to the statistics, there existed a strong correlation and fitting degree between the historical price trend of thermal coal in various regions of the Company in the past decade and the price index of Qinhuangdao port thermal coals (5500 kcal) in the past decade. From the perspective of a longer period, the coal in the past decade have experienced a period that featured the combination of relatively loose supply and relatively tight supply. As coal prices are intricate and are subject to periodic fluctuation, the Company is therefore of the view that the average 10-year coal procurement prices of power plants in each region are acceptable for both upstream and downstream of the coal supply chain. Therefore, the forecasted long-term coal price is based on the average 10-year historical coal procurement prices of Yangliuqing Co-generation, with the expectation that the coal price will fall gradually to RMB672.89/ton.

In 2022, the recoverable amount was determined based on the discounted future cash flow of the CGU using the assumption parameters detailed above and RMB421 million impairment loss of PPE was recognised. The Company engaged Beijing Tianjian Xingye Asset Evaluation Co., Ltd., an independent appraiser, to independently estimate the recoverable amount of the above CGU, and a valuation report on the impairment assessment of CGU was issued.

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 2: Discount rate

The Company determines the after-tax discount rate based on the weighted average cost of capital (WACC) when conducting the above CGUs impairment assessments and the goodwill impairment assessments of PRC power generation.

The calculating formula of the WACC is: WACC = Ke × (E/(D+E)) + Kd × (1-T) × (D/(D+E)). D is the value of debt and E is the value of equity. Among which, cost of equity is calculated by using the capital asset pricing model ("CAPM"), equals to risk-free return on investment ("risk-free rate") plus the return premium reflecting an entity's risk ("risk premium"), namely: Ke = Rf + β × ERP + ε. The values of each parameter are shown in the table below:

Parameters		Amount	Remarks
Rf	Risk-free interest rate	2.84%	Select China treasury bonds with a remaining maturity over 10 years from31 December 2022 in Shanghai and Shenzhen Stock Exchanges through WIND. Calculate their yield to maturity and take the average value as the risk-free interest rate.
beta	Beta Coefficient	0.2952	Calculate the beta coefficient based on the average value of the beta coefficient of comparable companies without financial leverage and the target capital structure; adjust the estimated beta coefficient using historical data by using the Blume Adjustment method.
ERP	Equity Risk Premiums	7.14%	Use CSI 300 index to estimate the rate of return on investment of the Chinese stock market; set 10-year period as the time span for calculating the rate of return on investment; use the geometric average rate of return on investment which can better reflect its growth.
ε	Specific Risk Premium Rate	5.00%	Use the comprehensive analysis method to determine the specific risk return rate ε, which means to consider all these factors of the assessed entities such as its asset scale, development stage, market competition status, internal governance structure and capital structure, etc.
Kd	Cost of Debt	4.30%	Take the five-year loan prime rate (LPR) as the cost of debt
T	Income Tax Rate	25%/15%, etc.	Determine the applicable income tax rate according to the Corporate Income Tax Law

7 PROPERTY, PLANT AND EQUIPMENT *(Cont'd)*

Impairment *(Cont'd)*

Note 2: Discount rate *(Cont'd)*

When the after-tax discount rate is calculated, the pre-tax discount rate is determined through an iterative loop calculation based on the assumption of "present value of cash flow before tax = present value of cash flow after tax". As a result of the calculation, the Company adopts pre-tax discount rates ranging from 7.60% to 9.22%.

Note 3: Impairment losses for individual asset

Each year, the Company performs impairment assessment of the decommissioned PPE in a timely manner, based on arrangements of current year industry policies, such as the shutting down of certain power plants, demolition of certain generation units for the purpose of technical transformation. The details for impairment losses recognised for such kind of PPE in 2022 are as follows:

Company name	Impairment recognised (RMB million)	Reasons for impairment and operational state before decommissioning
Huaneng Jining Yunhe Power Generation Co., Ltd. ("Yunhe Power")	40	No. 3 and No. 4 generation units of Yunhe Power were officially shut down in November 2022. Based on the impairment assessment conducted by Beijing Tianjian Xingye Asset Evaluation Co., Ltd., impairment losses of RMB40 million were recognised for the decommissioned assets after considering their recoverable amount. The generation units were in normal operational state before shutting down.
Total	40	

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES

	2022	2021 (Restated)
Beginning of the year	23,037,904	22,375,377
Upon adoption of IAS 16	47,933	4,219
Beginning of the year (restated)	23,085,837	22,379,596
Capital injections in associates and joint ventures	452,010	852,323
Share of net profit less loss	1,042,108	848,100
Share of other comprehensive income/(loss)	58,576	(44,304)
Share of other capital reserve	170,701	1,086
Dividends	(778,895)	(950,964)
Others	(14,707)	–
End of the year	24,015,630	23,085,837

As at 31 December 2022, 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	Indirect1
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%	–

(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	Indirect1
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%	–
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 2022, the fair value of the Group's shares in SECL was RMB7,569 million (31 December 2021: RMB9,640 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	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021
Gross amounts of the associates:												
Current assets	**1,100,688**	1,011,553	**31,058,240**	27,003,410	**38,444,363**	33,699,466	**1,008,534**	946,505	**10,073,828**	17,257,003	**2,159,709**	1,895,782
Non-current assets	**17,371,782**	15,969,523	**111,192,570**	104,596,390	**18,015,029**	18,287,225	**1,362,576**	1,169,435	**980,822**	3,502,773	**17,971,114**	18,912,695
Current liabilities	**(2,639,797)**	(4,346,583)	**(31,039,120)**	(27,078,010)	**(49,029,551)**	(44,746,000)	**(371,539)**	(520,045)	**(6,571,152)**	(13,851,633)	**(5,049,211)**	(4,183,200)
Non-current liabilities	**(10,825,208)**	(7,720,769)	**(55,924,080)**	(54,855,980)	**(48,213)**	(105,762)	**(115,648)**	(15,718)	**(1,012,966)**	(2,934,343)	**(10,251,039)**	(11,948,437)
Equity	**5,007,465**	4,913,724	**55,287,610**	49,665,810	**7,381,628**	7,134,929	**1,883,923**	1,580,177	**3,470,532**	3,973,800	**4,830,573**	4,676,840
– Equity attributable to shareholders	**3,755,599**	3,685,293	**28,575,742**	27,264,740	**7,381,628**	7,134,929	**1,883,923**	1,580,177	**3,587,178**	3,582,981	**4,830,573**	4,676,840
– Non-controlling interests	**1,251,866**	1,228,431	**26,711,868**	22,401,070	**–**	–	**–**	–	**(116,646)**	390,819	**–**	–
Revenue	**2,439,280**	2,489,554	**37,452,650**	29,975,740	**1,734,020**	1,606,826	**2,396,883**	1,779,286	**48,584,073**	68,257,609	**3,728,229**	3,442,936
Gross profit/(loss)	**1,207,814**	1,246,712	**6,508,080**	6,091,800	**993,187**	955,394	**422,447**	(236,323)	**222,107**	496,741	**871,212**	789,660
Net profit/(loss)	**651,064**	662,406	**2,434,670**	2,367,920	**626,699**	944,778	**279,830**	(276,684)	**4,323**	28,167	**143,002**	8,634
Profit/(loss) attributable to shareholders	**397,787**	410,948	**2,178,560**	2,281,820	**658,708**	944,778	**234,609**	(276,684)	**16,009**	(2,836)	**143,002**	8,634
Other comprehensive income/(loss) attributable to shareholders	**–**	–	**(159,960)**	(150,771)	**–**	–	**–**	–	**11,456**	(2,881)	**–**	–
Total comprehensive income/(loss) attributable to shareholders	**397,787**	410,948	**2,018,600**	2,131,049	**658,708**	944,778	**234,609**	(276,684)	**27,465**	(5,717)	**143,002**	8,634
Dividend received from the associates	**173,901**	144,520	**208,266**	309,423	**76,000**	156,000	**–**	–	**–**	50,000	**–**	–

(Amounts expressed in thousands of RMB unless otherwise stated)

8 INVESTMENTS IN ASSOCIATES AND JOINT VENTURES *(Cont'd)*

	Sichuan Energy Development		SECL		Huaneng Finance		Hanfeng Power		Huaneng Group Fuel Company		Hainan Nuclear	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Reconciled to the interests in the associates:												
Gross amounts of net assets attributable to shareholders of the associates	3,755,599	3,685,293	28,575,742	27,264,740	7,381,628	7,134,929	1,883,923	1,580,177	3,587,178	3,582,981	4,830,573	4,676,840
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	1,840,243	1,805,794	7,149,651	6,821,638	1,476,326	1,426,986	753,570	632,071	1,793,589	1,791,491	1,449,172	1,403,052
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	2,047,829	2,013,380	8,311,461	7,983,448	1,476,326	1,426,986	1,046,652	925,153	1,810,110	1,808,012	1,463,248	1,417,128

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	
	2022	2021	**2022**	2021
Gross amounts of joint ventures:				
Current assets	**471,142**	482,732	**929,587**	1,296,242
Non-current assets	**3,543,523**	3,666,424	**4,156,384**	4,585,414
Current liabilities	**(1,784,233)**	(2,204,087)	**(2,044,565)**	(2,746,397)
Non-current liabilities	**(510,336)**	(197,496)	**(1,849,333)**	(1,396,877)
Equity	**1,720,096**	1,747,573	**1,192,073**	1,738,382
Revenue	**1,910,036**	2,028,494	**4,360,813**	3,996,964
Gross profit/(loss)	**461,024**	567,470	**(392,559)**	(368,485)
Net profit/(loss)	**239,523**	300,268	**(351,555)**	(357,719)
Total comprehensive income/(loss)	**119,761**	300,268	**(351,555)**	(357,719)
Dividend received in cash from the joint ventures	**133,500**	50,000	**97,377**	10,820
Reconciled to the interests in the joint ventures:				
Gross amounts of net assets	**1,720,096**	1,747,573	**1,192,073**	1,738,382
The Group's effective interest rates	**50%**	50%	**50%**	50%
The Group's share of net assets	**860,048**	873,787	**596,037**	869,191
Impact of adjustments	**18,324**	18,324	**–**	–
Carrying amount in the consolidated financial statements	**878,372**	892,111	**596,037**	869,191

(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:

	2022	2021
Aggregate carrying amount of individually immaterial associates and joint ventures in the consolidated financial statements	**6,384,373**	5,702,495
Aggregate amounts of the Company and its subsidiaries' share of those associates and joint ventures		
Profit from continuing operations	**310,823**	236,306
Total comprehensive income	**336,271**	235,475

As at 31 December 2022, the Group's share of losses of associates exceeded its interests in the associates and the unrecognised further losses amounted to RMB643 million (31 December 2021: RMB563 million).

As at 31 December 2022, there were no proportionate interests in the associates' and joint ventures' capital commitments (31 December 2021: 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 2022, 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	RMB1,182,965,300	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%

(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 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%
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	RMB1,206,851,045	Sale of electricity, heat and steam; construction and operation of related facilities	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%

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 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%
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	RMB1,863,632,800	Power generation and supply development, management	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%

(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 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%
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%

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 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%
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	RMB1,041,271,769	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%
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%

(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
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%
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%

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 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%
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%

(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 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%
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 Hunan Energy Sales Limited Liability Company	PRC	Held directly	RMB210,000,000	Electricity and thermal energy product sale	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 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%
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%

(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 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%
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%

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 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%
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%

(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 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%
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%
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%

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 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%
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%

(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 (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%
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%

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 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 Hunan 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%
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%

(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 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%
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%

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 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	70%	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%
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%

(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 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	Wind power generation, solar power generation, biomass power generation, electricity supply,geothermal power generation, wind-solar complementary power supply system services	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%
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%

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) 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%
Huaneng Smart Energy (Jiaxiang) Co., Ltd. (i)	PRC	Held indirectly	RMB180,000,000	Production and sale of electricity and heat, production and sale of biomass gas, contract energy management	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%

(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 (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%
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%

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 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%
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%

(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 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%
Shangyi Guolang New Energy Co., Ltd.	PRC	Held indirectly	RMB10,000,000	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%

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 (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%
Huaneng (Linshu) New Energy Power Generation Co., Ltd. ("Linshu New Energy") (i) *	PRC	Held indirectly	RMB12,862,200	Hydropower; Power generation business, transmission business, power supply (distribution) business	80%	100%
Huaneng (Gaoqing) New Energy Co., Ltd. ("Gaoqing New Energy") (i) *	PRC	Held indirectly	RMB15,000,000	Power generation, transmission, and power supply business	80%	100%
Huaneng (Zhaoyuan) New Energy Technology Co., Ltd. ("Zhaoyuan New Energy") (i) *	PRC	Held indirectly	RMB38,702,000	Power generation business, transmission business, power supply (distribution) business	64%	80%
Jinhua Nuotan New Energy Development Co., Ltd. ("Nuotan New Energy") *	PRC	Held indirectly	RMB500,000	Wind power technical services; Research and development of emerging energy technologies	100%	100%

(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 (Macheng) Clean Energy Co., Ltd. ("Macheng Clean Energy") *	PRC	Held indirectly	RMB5,000,000	Power generation business, transmission business, power supply business	100%	100%
Huaneng (Shunchang) Clean Energy Co., Ltd. ("Shunchang Clean Energy") *	PRC	Held indirectly	RMB5,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Zhangzhou) Clean Energy Co., Ltd. ("Zhangzhou Clean Energy") *	PRC	Held indirectly	RMB5,000,000	Power generation business, transmission business, power supply business	100%	100%
Fujian Huatai Zhigu Energy Development Co., Ltd. ("Fujian Huatai Zhigu") *	PRC	Held indirectly	RMB10,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huarong Wisdom (Shanghai) Energy Technology Co., Ltd. ("Huarong Wisdom Energy") *	PRC	Held indirectly	RMB3,000,000	Construction engineering	51%	51%
Huaneng Napo New Energy Co., Ltd. ("Napo New Energy") *	PRC	Held indirectly	RMB200,000,000	Power generation, transmission, and power supply business	100%	100%
Huaneng Rongshui New Energy Co., Ltd. ("Rongshui New Energy") *	PRC	Held indirectly	RMB100,000	Power generation, transmission, and power supply business	100%	100%
Huaneng (Jian) New Energy Limited Liability Company ("Jian New Energy") *	PRC	Held directly	RMB4,791,000	Power generation, transmission, and power supply business	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 Yingcheng Energy Developing Co., Ltd. *	PRC	Held indirectly	RMB1,224,000,000	Power generation business, transmission business, power supply (distribution) business	85%	85%
Hefei Yangjie New Energy Technology Co., Ltd. *	PRC	Held indirectly	RMB1,000,000	Solar power generation technical services	100%	100%
Taixing Huazhijian Integrated Energy Service Co., Ltd. *	PRC	Held indirectly	RMB16,950,000	Power generation business, transmission business	100%	100%
Lianyungang Huazhijian New Energy Co., Ltd. *	PRC	Held indirectly	RMB15,718,740	Power generation business, transmission business	100%	100%
Huaneng Friendship Clean Energy Co., Ltd. *	PRC	Held indirectly	RMB10,000,000	Power generation, transmission, and power supply business	100%	100%
Huaneng (Qufu) New Energy Co., Ltd. (i) *	PRC	Held indirectly	RMB12,879,000	Cooling services	80%	100%
Anhui Nengxin New Energy Co., Ltd. *	PRC	Held indirectly	RMB10,000,000	Power generation business, transmission business, power supply (distribution) business	51%	51%
Huaneng (Zhenghe) Clean Energy Co., Ltd. *	PRC	Held indirectly	RMB5,000,000	Heat production supply	100%	100%
Huaneng (Qingyuan) Gas Engine Thermopower Co., Ltd. *	PRC	Held indirectly	RMB10,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Zhoushan Liuheng) Offshore Wind Power Co., Ltd. (Liuheng Wind Power "") * (xviii)	PRC	Held indirectly	RMB1,800,000,000	Power generation, transmission, and power supply business	51%	71%
Huaneng Miluo Integrated Energy Co., Ltd. *	PRC	Held directly	RMB100,000	Wind power	100%	100%

(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 (Changsha) New Energy Co., Ltd. *	PRC	Held directly	RMB30,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Nanchang Clean Energy Co., Ltd. *	PRC	Held indirectly	RMB310,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Seraf Gaoan New Energy Co., Ltd. *	PRC	Held indirectly	RMB200,000,000	Power generation business, transmission business, power supply (distribution) business	99%	99%
Huaneng Diandong Energy (Guizhou) Co., Ltd. *	PRC	Held indirectly	RMB10,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Clean Energy (Qujing Xuanwei) Co., Ltd. *	PRC	Held indirectly	RMB1,000,000	Production and supply of electricity	75%	75%
Huaneng (Danzhou) Photovoltaic Power Generation Limited Company (i) *	PRC	Held indirectly	RMB138,880,000	Power generation, transmission, and power supply business	66%	72%
Huaneng Chongyang New Energy Co., Ltd. *	PRC	Held indirectly	RMB900,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Suqian Huajian New Energy Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Xiyang New Energy Power Generation Co., Ltd. *	PRC	Held indirectly	RMB1,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Anda Clean Energy Co., Ltd. *	PRC	Held indirectly	RMB540,000,000	Power generation business, transmission business, power supply (distribution) business	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 Mountain Salt (Shouguang) New Energy Co., Ltd. (i) *	PRC	Held indirectly	RMB200,000,000	Research and development of emerging energy technologies	53%	66%
Huaneng (Linyi) New Energy Co., Ltd. (i) *	PRC	Held indirectly	RMB7,800,000	Power generation business, transmission business, power supply (distribution) business	80%	100%
Huaneng (Yantai Fushan) New Energy Co., Ltd. (i) *	PRC	Held indirectly	RMB117,550,000	Power generation business, transmission business, power supply (distribution) business	80%	100%
Huaneng (Longkou) New Energy Technology Development Co., Ltd. (i) *	PRC	Held indirectly	RMB1,964,790,200	Research and development of emerging energy technologies	64%	80%
Huaneng (Zibo Linzi) New Energy Co., Ltd. (i) *	PRC	Held indirectly	RMB264,00,000	Research and development of emerging energy technologies	80%	100%
Huaneng Telaidian (Shandong) Energy Co., Ltd. (i) *	PRC	Held indirectly	RMB3,600,000	EV charging infrastructure operations	56%	70%
Zibo Boshan Jinrong New Energy Technology Co., Ltd. (i) *	PRC	Held indirectly	RMB30,000,000	Research and development of emerging energy technologies	76%	95%
Zibo Boshan District Yirong New Energy Technology Co., Ltd. (i) *	PRC	Held indirectly	RMB30,000,000	Solar power generation technical services	76%	100%
Huaneng (Dongming) New Energy Technology Development Co., Ltd. (i) *	PRC	Held indirectly	RMB300,000,000	Research and development of emerging energy technologies	56%	70%

(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 (Heze Dongming) New Energy Development Co., Ltd. (i) *	PRC	Held indirectly	RMB145,230,000	Power generation business, transmission business, power supply (distribution) business	80%	100%
Huaneng Lingqiu Integrated Energy Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Dalian) Power New Energy Development Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Dalian) Energy Power Co., Ltd. *	PRC	Held indirectly	RMB20,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Saida (Tianjin) Integrated Energy Service Co., Ltd. *	PRC	Held indirectly	RMB70,000,000	Power supply business	51%	51%
Huaneng Ruyang Clean Energy Co., Ltd. *	PRC	Held indirectly	RMB10,000,000	All kinds of engineering construction activities	100%	100%
Huaneng (Pinghe) Clean Energy Co., Ltd. *	PRC	Held indirectly	RMB5,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Minqing) Clean Energy Co., Ltd. *	PRC	Held indirectly	RMB5,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Yangjiang High Tech Zone) New Energy Co., Ltd. *	PRC	Held indirectly	RMB5,000,000	Power generation business, transmission business, power supply (distribution) business	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
Xianning Tongshan Xiaoyang New Energy Co., Ltd. *	PRC	Held indirectly	RMB373,790,340	Power generation business, transmission business, power supply (distribution) business	100%	100%
Xianning Tongshan Yanghui New Energy Co., Ltd. *	PRC	Held indirectly	RMB373,790,340	Power generation business, transmission business, power supply (distribution) business	100%	100%
Wangdu Wangfa New Energy Technology Co., Ltd. *	PRC	Held indirectly	RMB5,000,000	New energy technology promotion services	80%	80%
Neiqiu County Handan New Energy Technology Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	90%	90%
Huaneng Leting Integrated Energy Co., Ltd. *	PRC	Held indirectly	RMB500,000	New energy technology promotion services	100%	100%
Huaneng (Yingkou) Green Energy Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Xilin New Energy Co., Ltd. *	PRC	Held indirectly	RMB20,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Nuotan (Shanghai) Clean Energy Development Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Shanyin Photovoltaic Power Generation Co., Ltd. *	PRC	Held directly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Fushun) Energy Development Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%

(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 (Chaoyang) Energy Development Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng (Shenyang) Energy Development Co., Ltd. *	PRC	Held indirectly	RMB500,000	Power generation business, transmission business, power supply (distribution) business	100%	100%
Huaneng Lingbao Comprehensive Energy Co., Ltd. *	PRC	Held directly	RMB120,000,000	Power generation business, transmission business, power supply (distribution) business	70%	70%
Huaneng Yuanling New Energy Co., Ltd. *	PRC	Held directly	RMB10,000	Wind power generation; Solar power generation, electricity sales	100%	100%
Zilai Renewable Resources Technology (Nanjing) Co., Ltd. *	PRC	Held indirectly	RMB30,000,000	Technical consultation on resource recycling services	51%	51%
Huaneng Qian'an Integrated Energy Co., Ltd. *	PRC	Held indirectly	RMB500,000	New energy technology promotion services	100%	100%
Jiangxi Huaneng Changxian New Energy Co., Ltd. *	PRC	Held indirectly	RMB720,000,000	Power generation business, transmission business, power supply (distribution) business	70%	70%
Huaneng (Yongxin) New Energy Co., Ltd. *	PRC	Held indirectly	RMB660,000,000	Power generation business, transmission business, power supply (distribution) business	70%	70%

* These companies were newly established in 2022.

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%

(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
Yangliuqing Co-generation	PRC	Held directly	RMB1,537,130,909	Power generation, heat supply, facilities installation, maintenance and related services	55%	55%
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%

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 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	RMB2,404,414,900	Development, investment construction, production and management of power (thermal) projects	100%	100%
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%

(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
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	RMB6,276,430,300	Power (thermal) projects, development of new energy projects and investment, construction, production, operation and sale	100%	100%
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%

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 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%
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 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%

(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 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	HK$10,000	Investment	80%	100%
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%
Yunhe Power (i)	PRC	Held indirectly	RMB696,355,300	Electrical (thermal) production and on-grid sale, technology consulting and services	78.68%	98.35%
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%

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 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%
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%
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 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 Energy Engineering Co., Ltd. ("Shandong Energy Engineering") (iv)	PRC	Held indirectly	RMB50,000,000	Power engineering design and construction	76.55%	100%

(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%

(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
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%
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%
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%

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
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%
Huaneng Anyang Co-generation Limited Liability Company ("Anyang thermoelectric") (i) (xvii) **	PRC	Held directly	RMB152.232,000	Electric power production and sale	51%	100%
Shandong Fangxing Industry Co., LTD. (i) **	PRC	Held indirectly	RMB35,210,000	Wholesale and retail; Property management, collection and payment of water, electricity and heat bills	80%	100%
Shandong Laiwu Fangxing Thermal Power Co., Ltd. (i) **	PRC	Held indirectly	RMB20,000,000	Heat production and supply; Construction engineering design; construction projects; Special equipment manufacturing	40.8%	51%
Hebei Jieyuan Vegetable Planting Co., Ltd. **	PRC	Held indirectly	RMB46,134,000	Greenhouse vegetable planting, solar distributed generation	100%	100%

** These companies were newly acquired in 2022.

As at 31 December 2022, based on the "Legal Opinion on Ownership Confirmation of Huangtai #8 Power Plant Proposed by Huangtai Power", Huangtai #8 Power Plant was consolidated as a business acquisition.

(Amounts expressed in thousands of RMB unless otherwise stated)

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%

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%
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%
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	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	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	Development and operation of new energy power projects	80%	80%
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%

(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
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 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%
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	Solar photovoltaic power generation system design, integration, installation	49%	100%

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
Xishui Hengtai Power Co., Ltd. ("Hengtai P ower") (xiv)	PRC	Held indirectly	RMB226,282,000	Solar photovoltaic power generation system design, integration, installation	49%	100%
Huanggang Xinxiang New Energy Power Generation Co., Ltd. ("Xinxiang New Energy") (i) ***	PRC	Held indirectly	RMB60,000,000	Solar power generation; solar module manufacturing, processing and sales	80%	100%
Huanggang Jiangpeng New Energy Power Generation Co., Ltd. ("Jiangpeng New Energy") ***	PRC	Held indirectly	RMB60,000,000	Solar power generation; solar module manufacturing, processing and sales	80%	80%
Suzhou Xinmao New Energy Co., Ltd. ("Xinmao New Energy") ***	PRC	Held indirectly	RMB16,000,000	Technical services, technology development, technical consultation, technology exchange	100%	100%
Jinhua Dongyan New Energy Co., Ltd. ("Dongyan New Energy") ***	PRC	Held indirectly	RMB16,000,000	Power generation, transmission, and power supply business	100%	100%
Guangzhou Huadu Qihang New Energy Co., Ltd. ("Huadu Qihang New Energy") ***	PRC	Held indirectly	RMB6,213,581,411	Wind power technical services; R&D of emerging energy technologies; Research and development of offshore wind related systems	100%	100%
Guangzhou Huadu District Qifan New Energy Co., Ltd. ("Huadu Qifan New Energy") ***	PRC	Held indirectly	RMB100,000	Wind power technical services; R&D of emerging energy technologies; Research and development of offshore wind related systems	100%	100%
Anji Ruineng New Energy Development Co., Ltd. ("Anji Ruineng New Energy") ***	PRC	Held indirectly	RMB10,000,000	Power generation business, transmission business, power supply (distribution) business	100%	100%

(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
Shanxi Jinlisheng Energy Technology Co., Ltd. ("Jinlisheng Energy Technology") ***	PRC	Held indirectly	RMB1,060,000	Featured agricultural sightseeing tourism, photovoltaic power generation	100%	100%
Wugang Yongheng New Energy Co., Ltd. ***	PRC	Held indirectly	RMB12,000,000	Solar cells and their components, solar lamps	100%	100%
Yingcheng Huachen New Energy Co., Ltd. (i) ***	PRC	Held indirectly	RMB339,177,360	Power generation business, transmission business, power supply (distribution) business	85%	100%
Kaifeng Yangzhao New Energy Co., Ltd. ***	PRC	Held indirectly	RMB1,000,000	Research and development of emerging energy technologies	100%	100%
Huakang Anze New Energy Co., Ltd. (i) ***	PRC	Held indirectly	RMB1,000,000	Research and development of emerging energy technologies	82%	100%
Quanjiao Xiangneng New Energy Co., Ltd. (i) ***	PRC	Held indirectly	RMB100,000,000	Solar power generation technical services	60%	100%
Changde Hongyue New Energy Co., Ltd. ***	PRC	Held directly	RMB20,000,000	Power generation business, transmission business, power supply (distribution) business	80%	80%
Yingcheng Huachen New Energy Co., Ltd. (i) ***	PRC	Held indirectly	RMB339,177,360	Power generation business, transmission business, power supply (distribution) business	85%	100%
Hefei Yangyuan New Energy Technology Co., Ltd. **	PRC	Held indirectly	RMB1,000,000	Solar power generation technical services	100%	100%
Wugang Keheng New Energy Co., Ltd. ***	PRC	Held directly	RMB5,000,000	Solar power generation, photovoltaic equipment retail	100%	100%

*** These companies were newly acquired in 2022.

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

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.

(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, 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 Energy Engineering; meanwhile, Shandong Power indirectly holds a total of 23.68% equity interests and 28% voting rights in Shandong Fuel Company and Shandong Energy Engineering respectively through its own subsidiaries. Thus, the Company indirectly holds 76.55% interests and 100% voting rights in Shandong Energy Engineering, 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.

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

Notes: *(Cont'd)*

(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.

(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.

9 INVESTMENTS IN SUBSIDIARIES *(Cont'd)*

(iv) Subsidiaries acquired from asset acquisitions *(Cont'd)*

Notes: *(Cont'd)*

(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.

(xvii) According to the voting in concert agreement entered into between the Group and one shareholder with 49% equity interests in Anyang thermoelectric 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 Anyang thermoelectric.

(xviii) According to the voting in concert agreement entered into between the Group and one shareholder with 20% equity interests in Liuheng 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 Liuheng Wind Power.

10 OTHER EQUITY INSTRUMENT INVESTMENTS

	As at 31 December	
	2022	2021
Equity securities designated as at FVOCI (non-recycling)		
Listed equity investments at fair value	**–**	6,865
Unlisted equity investments at fair value 7.89% of Ganlong Double-track Railway Co., Ltd.	**443,999**	457,292
Others	**264,913**	264,913
Subtotal	**708,912**	722,205
Total	**708,912**	729,070

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.

(Amounts expressed in thousands of RMB unless otherwise stated)

11 POWER GENERATION LICENCE

The movements in the carrying amount of the power generation licence during the years are as follows:

	2022	2021
Beginning of the year	3,783,756	3,954,983
Movement:		
Currency translation differences	373,090	(171,227)
End of the year	4,156,846	3,783,756

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 2022 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 2022 (2021: Nil). For key assumptions used for value-in-use calculations, please refer to Note 14 for details.

12 MINING RIGHTS

The movements in the carrying amount of mining rights during the years are as follows:

	2022	2021
Beginning of the year		
Cost	2,506,867	2,506,867
Accumulated impairment losses	(895,381)	(895,381)
Net book value	1,611,486	1,611,486
Movements:		
Addition	–	–
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 2022, no impairment losses for mining rights (2021: Nil) have been recognised.

13 DERIVATIVE FINANCIAL INSTRUMENTS

Details of derivative financial instruments are as follows:

	As at 31 December	
	2022	2021
Derivative financial assets		
– Hedging instruments for cash flow hedge (fuel swap contracts)	20,171	669,959
– Hedging instruments for cash flow hedge (exchange forward contracts)	21,637	52,252
– Hedging instruments for cash flow hedge (interest rate swap contracts)	6,687	–
Total	48,495	722,211
Less: non-current portion		
– Hedging instruments for cash flow hedge (fuel swap contracts)	1,801	20,516
– Hedging instruments for cash flow hedge (exchange forward contracts)	1,769	49,237
Total non-current portion	3,570	69,753
Total current portion	44,925	652,458
Derivative financial liabilities		
– Hedging instruments for cash flow hedge (fuel swap contracts)	360,798	16,328
– Hedging instruments for cash flow hedge (exchange forward contracts)	298,231	14,201
– Hedging instruments for cash flow hedge (interest rate swap contracts)	3,821	109,828
Total	662,850	140,357
Less: non-current portion		
– Hedging instruments for cash flow hedge (fuel swap contracts)	39,557	4,383
– Hedging instruments for cash flow hedge (exchange forward contracts)	202,235	1,777
– Hedging instruments for cash flow hedge (interest rate swap contracts)	3,821	93,163
Total non-current portion	245,613	99,323
Total current portion	417,237	41,034

13 DERIVATIVE FINANCIAL INSTRUMENTS *(Cont'd)*

For the years ended 31 December 2022 and 2021, 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.

TPSTMWR 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 2022 was S$136 million (RMB equivalent of RMB705 million) (31 December 2021: S$139 million (RMB equivalent of RMB658 million)). Through these arrangements, TPG and TPSTMWR 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 2022, the remaining interest rate swap contracts were carried on the consolidated statement of financial position as financial assets of RMB3 million (31 December 2021: financial liabilities of RMB110 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:

	Carrying amounts	Contractual cash flows	Maturity		
			Within 1 year	Between 1 and 5 years	After 5 years
As at 31 December 2022					
Derivative financial assets					
Fuel derivatives used for hedging (net settlement)	20,171	20,171	18,370	1,801	–
Forward exchange contracts used for hedging					
– inflows	–	187,124	(18,567)	205,691	–
– outflows	–	(187,094)	38,271	(225,365)	–
	21,637	30	19,704	(19,674)	–
Net-settled interest rate swaps used for hedging					
– net cash outflows	2,866	(954)	(6,859)	491	5,414
Derivative financial liabilities					
Fuel derivatives used for hedging (net settlement)	(360,798)	(360,798)	(321,241)	(39,557)	–
Forward exchange contracts used for hedging					
– inflows	–	9,950,475	2,723,053	7,227,422	–
– outflows	–	(10,013,097)	(2,821,973)	(7,191,124)	–
	(298,231)	(62,622)	(98,920)	36,298	–

(Amounts expressed in thousands of RMB unless otherwise stated)

13 DERIVATIVE FINANCIAL INSTRUMENTS *(Cont'd)*

	Carrying amounts	Contractual cash flows	Maturity 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)

14 GOODWILL

The movements of goodwill during the years are as follows:

	2022	2021
Beginning of the year		
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
Movements:		
Impairment charge for the year	(897,524)	–
Currency translation differences – cost	1,035,098	(475,051)
Currency translation differences – impairment	(28,889)	13,259
End of the year	14,384,909	14,276,224
Cost	19,325,582	18,290,484
Accumulated impairment losses	(4,940,673)	(4,014,260)
Net book value	14,384,909	14,276,224

Impairment tests for goodwill

In the impairment assessment of the Group, goodwill is allocated to a CGU or CGUs that were 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:

	2022	2021
PRC power segment:		
Yunhe Power	295,001	295,001
Linyi Power	–	382,500
Wuhan Power	518,484	518,484
Liaocheng Co-generation	–	429,750
Overseas segment:		
Tuas Power	11,210,843	10,204,634

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").

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, Liaocheng Co-generation, Linyi Power and Baiyanghe Power recognised RMB430 million (2021: Nil), RMB383 million (2021: Nil) and RMB85 million (2021: Nil), impairment losses of goodwill respectively in 2022. For details of key assumptions (including WACC) used, please refer to Note 7.

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.

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 2.8% 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%,19.2% and 22.3% in 2019,2020,2021 and 2022, 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% (2021: 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 9.94% for the year ended 31 December 2022 (2021: 8.55%).

According to the impairment assessment, there was no impairment provided for the goodwill of Tuas Power for the year ended 31 December 2022 (2021: Nil). In 2022 and 2021, the fluctuation of goodwill in respect of Tuas Power was due to currency translation differences.

14 GOODWILL *(Cont'd)*

Impairment tests for goodwill *(Cont'd)*

Key assumptions used for value-in-use calculations: *(Cont'd)*

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 2021: 0.5%) would result in a decrease of approximately RMB1,003 million (31 December 2021: RMB1,857 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 RMB31 million and RMB1,059 million (31 December 2021: RMB103 million and RMB1,231 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 RMB171 million and RMB2,172 million (31 December 2021: RMB264 million and RMB2,075 million), respectively.

15 OTHER NON-CURRENT ASSETS

Details of other non-current assets are as follows:

	As at 31 December	
	2022	2021
Finance lease receivables (i) (Note 41)	**8,682,006**	8,664,550
VAT recoverable	**5,604,843**	6,213,495
Prepayments for pre-construction cost	**953,147**	479,138
Intangible assets (ii)	**657,420**	632,639
Prepaid connection fees	**24,156**	28,598
Contract assets	**1,002,283**	837,559
Others	**2,304,074**	2,200,026
Total	**19,227,929**	19,056,005

15 OTHER NON-CURRENT ASSETS *(Cont'd)*

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 2022, there was no impairment provided for the intangible assets (2021: Nil).

(iii) Impairment loss of Huangtai Power to Huangtai #8 Power Plant

Huangtai #8 Power Plant is located in Huangtai Power. And as an unincorporated entity, it is accounted separately, with the main assets comprising a 330 MW power generation unit and its ancillary facilities. According to the Reply of the State-owned Assets Supervision and Administration Commission of the State Council on Issues Concerning the Agreement Transfer of State-owned Equity Interests and Relevant Assets of 11 Enterprises, including Yantai Huanghai Thermal Power Co., Ltd. (SASAC Property Right [2009] No.70) issued by Administration Commission of the State Council in February 2009 and the Property Rights Transfer Contract signed between Shandong Power and Shandong Luneng Development Group Co., Ltd., Shandong Power is entitled to 30% of the interests in Huangtai #8 Power Plant. Huangtai #8 Power Plant commenced operation in December in 1990, with an installed capacity of 330MW. The Power Generation License was extended to December 2030 after expiration in 2020. Daily operation and management of Huangtai #8 Power Plant is entrusted to Huangtai Power.

In 2009, Huangtai #8 Power Plant was granted a unified loan from Huangtai Power, with an amount of RMB485 million. However, Huangtai #8 Power Plant failed to settle the unified loan granted by Huangtai Power as a result of its recurring losses, and thus forming a long-term open account due to Huangtai Power.

In 2021, the Company engaged Zhonglian Asset Appraisal Group Co., Ltd. to independently appraise the recoverable amount of the above-mentioned net investment and an asset appraisal report (Zhong Lian Ping Bao Zi [2022] No.746) was issued. According to the appraisal results, Huangtai Power recognised RMB110 million impairment loss in 2021.

In 2022, the price of standard coal into the furnace was RMB1,188/ton (2021: RMB1,167/ton) which was still at a high level. Although the average tariff of 2022 was floated to the 20% upward ceiling, Huangtai #8 Power Plant still realized a loss of RMB106.49 million.

15 OTHER NON-CURRENT ASSETS *(Cont'd)*

Notes: *(Cont'd)*

(iii) Impairment loss of Huangtai Power to Huangtai #8 Power Plant *(Cont'd)*

In 2022, the Company conducted impairment assessment of the CGU of Huangtai #8 Power Plant. Key assumption parameters used in estimating the recoverable amount of the above-mentioned loan receivable include future sales volumes (power generation hours) and fuel prices. Other assumption parameters applied in the impairment assessment mainly include the average tariff. Key assumption parameters are listed in the following table:

	Sales volume (power generation hours) Unit: hours/year		Tariff (excluding tax) Unit: RMB/MWh		Fuel prices (price of standard coal into the furnace) Unit: RMB/ton	
Company name	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**	**Forecast period**	**Actual in 2022**
Huangtai #8 Power Plant	3,700	4,248	2023: 432.96 2024: 410.77 2025: 399.67 2026: 388.57 2027 and afterwards: 377.48	420.47	2023: 900.29 2024: 856.10 2025: 811.91 2026: 767.72 2027 and afterwards: 723.55	1,178.35

Sales volume (power generation hours):

The Company estimated the power generation hours in the forecast period based on the market condition and the relevant power trading policies. According to the "*14th Five-Year Plan*" of Electrical Power Development in Shandong Province, the incremental electricity consumption of the whole society in Shandong Province during the forecast period shall demonstrate an annual incremental rate of about 4.1% per annum. Although the proportion of coal-fired power generation in the total social power generation was expected to decrease from 68.5% in 2020 to 59% in 2025, the total installation of coal-fired power generation in 2025 will still demonstrate an upward trend compared to 2020. Meanwhile, according to the "*14th Five-Year Plan*" of Electrical Power Development in Shandong Province, by 2025, the total installed coal-fired capacity shall be kept around 100,000 Mw, which was expected to remain basically unchanged with the installation amount of 103,000 Mw in year 2020. Therefore, the incremental electricity consumption in Shandong Province can compensate for the influence of incremental installation capacity from new energy power plants and power supply from outside the province, thus coal-fired power units can maintain stable power generation hours during the forecast period. Meanwhile, considering that Huangtai #8 Power Plant is now under extended service, and, accordingly, it was expected to have lower peak shaving capacity and higher operating pressure during the entire months of heating seasons, the Company expects that the forecasting power generation hours of Huangtai #8 Power Plant are lower than the average power generation hours of the coal-fired generation units affiliated to Shandong Power. And the Company forecasts that the power generation hours of Huangtai #8 Power Plant to be 3,700 hours.

15 OTHER NON-CURRENT ASSETS *(Cont'd)*

Notes: *(Cont'd)*

(iii) Impairment loss of Huangtai Power to Huangtai #8 Power Plant *(Cont'd)*

Tariff:

Based on relevant national policies and regional electricity trading policies, the Company estimated the average tariff in the forecast period with reference to the current tariff level and the floating range of benchmark tariff. Referring to the terms in Document No.303 that encouraged to set reasonable terms on on-grid electricity tariff in medium and long-term electricity transaction contracts, so as to form price linkage between electricity tariff and coal prices in the medium and long-term contracts, achieving the effectively transmission between coal prices and electricity tariffs. With the gradual return of fuel prices, management forecasts that future tariff will gradually decline on current basis to a reasonable range.

The comprehensive average electricity tariff excluding tax in 2023 was expected to be RMB432.96/MWh, which is slightly higher than the actual tariff of RMB420.47/MWh in 2022, for the main reason that with the stable operation after the launch of spot electricity market, the marketized transaction tariff was expected to have a certain increase compared to 2022.

Fuel prices (price of standard coal into the furnace):

The Company estimated the fuel prices in the forecast period based on the coal's source structure, supply and demand situation, as well as the relevant industry policies.

As mentioned earlier in Note 7, the implementation period of the aforementioned national policies, and the time for the commencement of the operation of the newly increased coal production capacities, combining factors such as the coal consumption structure, coal origins, and transportation modes of individual power plants, and estimates that there may be repeated imbalances between the relationship of coal supply and demand, thus expecting that coal prices would gradually fall from the current high level to the rational range as specified in Document No.303.

With regard to the coal prices in the long run, the Company reckons that the domestic coal market can achieve a balanced supply and demand in the future. The under-supply that emerged since the end of 2021 will be levelled. According to the statistics, there existed a strong correlation and fitting degree between the historical price trend of thermal coal in various regions of the Company in the past decade and the price index of Qinhuangdao port thermal coals (5500 kcal) in the past decade. From the perspective of a longer period, the coal in the past decade have experienced a period that featured the combination of relatively loose supply and relatively tight supply. As coal prices are intricate and are subject to periodic fluctuation, the Company is therefore of the view that the average 10-year coal procurement prices of power plants in each region are acceptable for both upstream and downstream of the coal supply chain. Therefore, the forecasted long-term coal price is based on the average 10-year historical coal procurement prices of Huangtai #8 Power Plant, with the expectation that the coal price will fall gradually to RMB723.55/ton.

Please refer to Note 7 for details of discount rate.

In 2022, the recoverable amount was determined based on the discounted future cash flow of the CGU using the assumption parameters detailed above and RMB375 million impairment loss for the related assets of Huangtai Power was recognised. The Company engaged Beijing Tianjian Xingye Asset Evaluation Co., Ltd., an independent appraiser, to independently estimate the recoverable amount of the above CGU, and a valuation report on the impairment assessment of CGU was issued.

16 INVENTORIES

Inventories comprised:

	As at 31 December	
	2022	2021
Fuel for power generation	11,397,924	15,598,354
Material and supplies	1,487,787	1,395,459
	12,885,711	16,993,813
Less: provision for inventory obsolescence	183,803	169,382
Total	12,701,908	16,824,431

Movements of provision for inventory obsolescence during the years are analysed as follows:

	2022	2021
Beginning of the year	(169,382)	(198,646)
Provision	(7,708)	(1,583)
Reversal	1,222	1,825
Write-off*	4,649	23,365
Currency translation differences	(12,584)	5,657
End of the year	(183,803)	(169,382)

* In 2022, approximately RMB5 million provision was written-off for the material and supplies which was provided for inventory provision in previous years.

(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	
	2022	2021
Prepayments for inventories	**6,168,858**	4,002,491
Prepaid income tax	**124,575**	695,156
Others	**444,918**	436,411
Subtotal of prepayments	**6,738,351**	5,134,058
Less: Loss allowance	**2,638**	2,638
Total prepayments, net	**6,735,713**	5,131,420
Dividends receivable	**288,979**	206,539
Receivables from sales of fuel	**74,458**	179,712
Others	**2,665,686**	3,362,070
Subtotal of other receivables	**3,029,123**	3,748,321
Less: Loss allowance	**295,645**	220,826
Total other receivables, net	**2,733,478**	3,527,495
VAT recoverable	**3,441,183**	5,109,848
Finance lease receivables (Note 41)	**761,752**	550,594
Designated loan to a joint venture*	**72,814**	75,100
Others	**396,059**	369,090
Subtotal other assets	**4,671,808**	6,104,632
Less: Loss allowance	**64,615**	64,615
Total other assets, net	**4,607,193**	6,040,017
Gross total	**14,439,282**	14,987,011
Net total	**14,076,384**	14,698,932

* The designated loan was borrowed by Huaneng Yingkou Port Co., Ltd., a joint venture of the Company. As of 31 December 2022, the loan was overdue and not repaid.

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.

17 OTHER RECEIVABLES AND ASSETS *(Cont'd)*

The gross amounts of other receivables are denominated in the following currencies:

	As at 31 December	
	2022	2021
RMB	**2,314,757**	2,832,004
S$ (RMB equivalent)	**189,546**	352,138
US$ (RMB equivalent)	**376**	39,495
PKR (RMB equivalent)	**524,444**	524,684
Total	**3,029,123**	3,748,321

Movements of provision for loss allowance during the years are analysed as follows:

	2022	2021
Beginning of the year	**(288,079)**	(254,928)
Provision	**(92,742)**	(55,217)
Reversal	**108**	189
Write-off	**76**	3,101
Others	**–**	–
Currency translation differences	**17,739**	18,776
End of the year	**(362,898)**	(288,079)

(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	
	2022	2021
Accounts receivable	39,986,340	40,274,603
Notes receivable	2,792,246	3,743,482
	42,778,586	44,018,085
Less: Loss allowance	124,254	140,088
Total	42,654,332	43,877,997
Analysed into:		
Accounts receivable		
– At amortised cost	39,986,340	39,996,822
– At fair value through other comprehensive income	–	277,781
	39,986,340	40,274,603
Notes receivable		
– At amortised cost	2,792,246	3,743,482

The gross amounts of accounts receivable and notes receivable are denominated in the following currencies:

	As at 31 December	
	2022	2021
RMB	38,114,036	39,818,368
S$ (RMB equivalent)	1,756,789	1,177,499
US$ (RMB equivalent)	311,964	85,595
PKR (RMB equivalent)	2,595,797	2,936,623
Total	42,778,586	44,018,085

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. The credit period of accounts receivable from CPPA-G by Ruyi Pakistan Energy was five months.

18 ACCOUNTS AND NOTES RECEIVABLE *(Cont'd)*

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 accounts receivable, please refer to Note 24 for details.

For the collateral of notes receivable, please refer to Note 27 and Note 30 for details.

Movements of provision for loss allowance during the years are analysed as follows:

	2022	2021
Beginning of the year	(140,088)	(155,929)
Provision	(10,941)	(22,096)
Reversal	24,859	36,586
Write-off	2,438	925
Currency translation differences	(522)	426
End of the year	(124,254)	(140,088)

An ageing analysis of accounts and notes receivable based on the invoice date was as follows:

	As at 31 December	
	2022	2021
Within 1 year	42,301,386	43,683,311
Between 1 and 2 years	241,380	114,471
Between 2 and 3 years	54,471	59,241
Over 3 years	181,349	161,062
Total	42,778,586	44,018,085

As at 31 December 2022, the maturity period of the notes receivable ranged from 1 to 12 months (31 December 2021: from 1 to 12 months).

(Amounts expressed in thousands of RMB unless otherwise stated)

19 COMPANY'S STATEMENT OF CHANGES IN EQUITY

	Share capital	Other equity instruments	Capital surplus						Surplus reserves	Reserve funds	Retained earnings	Total equity
			Share premium	Hedging reserve	Fair value reserve (non-recycling)	Other reserve in other comprehensive income	Other capital reserve	Subtotal				
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
Effect of adoption of IAS 16 amendments	-	-	-	-	-	-	-	-	-	-	74,506	74,506
Balance as at 1 January 2022	15,698,093	48,417,977	24,987,019	-	(324,622)	-	1,093,892	25,756,289	8,140,030	-	23,380,123	121,392,512
Profit/(loss) for the year ended 31 December 2022	-	2,191,950	-	-	-	-	-	-	-	-	(888,113)	1,303,837
Other comprehensive loss:												
Fair value changes of other equity investment instruments, net of tax	-	-	-	-	(9,970)	-	-	(9,970)	-	-	-	(9,970)
Total comprehensive income/(loss) for the year ended 31 December 2022	-	2,191,950	-	-	(9,970)	-	-	(9,970)	-	-	(888,113)	1,293,867
Issue of other equity instruments (Note21)	-	22,550,000	-	-	-	-	-	-	-	-	-	22,550,000
Redemption of other equity instruments (Note 21)	-	(9,000,000)	-	-	-	-	-	-	-	-	-	(9,000,000)
Cumulative distribution of other equity instruments (Note 21)	-	(2,136,535)	-	-	-	-	-	-	-	-	-	(2,136,535)
Transfer from retained profits	-	-	-	-	-	-	-	-	-	54,381	(54,381)	-
Others	-	60,312	-	-	-	-	(66,570)	(66,570)	-	-	-	(6,258)
Balance as at 31 December 2022	15,698,093	62,083,704	24,987,019	-	(334,592)	-	1,027,322	25,679,749	8,140,030	54,381	22,437,629	134,093,586

19 COMPANY'S STATEMENT OF CHANGES IN EQUITY *(Cont'd)*

			Capital surplus							
	Share capital	Other equity instruments	Share premium	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
Effect of adoption of IAS 16 amendments	–	–	–	–	–	–	–	–	4,220	4,220
Balance as at 1 January 2021 (Restated)	15,698,093	48,419,779	24,987,019	(289,360)	–	1,093,892	25,791,551	8,140,030	32,092,733	130,142,186
Profit/(loss) for the year ended 31 December 2021	–	2,137,420	–	–	–	–	–	–	(5,889,208)	(3,751,788)
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)	–	(5,889,208)	(3,787,050)
Cumulative distribution of other equity instruments	–	(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	23,380,123	121,392,512

(Amounts expressed in thousands of RMB unless otherwise stated)

20 SHARE CAPITAL

	2022		2021	
	Number of shares	Share capital RMB'000	Number of shares	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 2022

Type of Instruments	Issuance Date	Category	Initial Distribution Rate	Issue Price	Number	Par Value	Initial Period	Conversion Condition	Conversion Result
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
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	4.53%	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
2022 medium-term notes (5th)	July 2022	Equity Instrument	2.93%	0.1	20,000,000	2,000,000	3 years	None	None
2022 medium-term notes (8th)	September 2022	Equity Instrument	2.78%	0.1	5,000,000	500,000	3 years	None	None
2022 medium-term notes (9th)	October 2022	Equity Instrument	2.78%	0.1	20,000,000	2,000,000	3 years	None	None
2022 medium-term notes (10th)	October 2022	Equity Instrument	2.72%	0.1	20,000,000	2,000,000	3 years	None	None
2022 medium-term notes (11th)	November 2022	Equity Instrument	2.66%	0.1	25,000,000	2,500,000	3 years	None	None
Huaneng Trust (1st)	September 2022	Equity Instrument	2.91%	–	–	2,500,000	5 years	None	None
Huaneng Trust (2nd)	October 2022	Equity Instrument	3.06%	–	–	3,050,000	5 years	None	None
Huaneng Trust (3rd)	November 2022	Equity Instrument	3.11%	–	–	4,000,000	5 years	None	None
Huaneng Trust (4th)	November 2022	Equity Instrument	3.11%	–	–	4,000,000	5 years	None	None
Total						61,550,000			

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 (Bond A) and RMB2,500 million (Bond B), respectively. The perpetual corporate bonds are issued at par value with initial distribution rates of 5.05% and 5.17% with a term of 3 years and 5 years respectively. 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 years 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, and will remain it afterwards. 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. On the first call date of Bond B in September 2022, the Company decided to exercise the callable option. The bond was redeemed in whole on 25 September 2022.

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.

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, and will remain it afterwards. On the first call date of above medium-term notes in October 2022, the Company decided to exercise the callable option. The two tranches of medium-term notes were redeemed in whole on 18 October 2022 and 25 October 2022, respectively.

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, and will remain it afterwards. On the first call date of 2019 medium-term notes of RMB2,500 million, the Company decided to exercise the callable option. The bond was redeemed in whole on 5 November 2022.

In March 2020, the Company issued two tranches of perpetual corporate bonds with net proceeds of approximately RMB2,000 million (Bond C) and RMB1,000 million (Bond D), 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, and will remain it afterwards.

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, and will remain it afterwards.

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 (Bond E). 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, and will remain it afterwards.

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, and will remain it afterwards.

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, and will remain it afterwards.

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.

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 (Bond F). 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, and will remain it afterwards.

In July 2022, the Company issued medium-term notes with net proceeds of approximately RMB2,000 million. The medium-term notes are issued at par value with an initial distribution rate of 2.93%. 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. 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, and will remain it afterwards.

In September 2022, the Company issued medium-term notes with net proceeds of approximately RMB500 million. The medium-term notes are issued at par value with an initial distribution rate of 2.78%. 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. 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, and will remain it afterwards.

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major provisions *(Cont'd)*

In September 2022, the Company issued the first tranche of the Huaneng Trust Yingfeng No.1 Single Fund Trust ("Huaneng Trust (1st)") with the proceeds of RMB2,500 million. Huaneng Trust (1st) has no fixed period with initial distribution rate of 2.91%. The interest of Huaneng Trust (1st) is recorded as distributions, which is paid annually in arrears in August 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 or liquidation or bankruptcy the Company) occur. The Company has the right to defer current interest and all deferred interest. Huaneng Trust (1st) has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 5th 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 6th year after the issuance, to the basis rate plus 300 basis points, and will remain 5.91% afterwards.

In October 2022, the Company issued two medium-term notes with net proceeds of approximately RMB2,000 million and RMB2,000 million. The medium-term notes are issued at par value with an initial distribution rate of 2.78% and 2.72% respectively. 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. 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, and will remain it afterwards.

In October 2022, the company issued the second tranche of the Huaneng Trust Yingfeng No.1 Single Fund Trust ("Huaneng Trust (2nd)") with the proceeds of RMB3,050 million. Huaneng Trust (2nd) has no fixed period with initial distribution rate of 3.06%. The interest of Huaneng Trust (2nd) is recorded as distributions, which is paid annually in arrears in September 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 or liquidation or bankruptcy the Company) occur. The Company has the right to defer current interest and all deferred interest. Huaneng Trust (2nd) has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 5th 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 6th year after the issuance, to the basis rate plus 300 basis points, and will remain 6.06% afterwards.

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(b) Major provisions *(Cont'd)*

In November 2022, the Company issued medium-term notes with net proceeds of approximately RMB2,500 million. The medium-term notes are issued at par value with an initial distribution rate of 2.66%. 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. 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, and will remain it afterwards.

In November 2022, the company issued the third tranche of the Huaneng Trust Yingfeng No.1 Single Fund Trust ("Huaneng Trust (3rd)") with the proceeds of RMB4,000 million. Huaneng Trust (3rd) has no fixed period with initial distribution rate of 3.11%. The interest of Huaneng Trust (3rd) is recorded as distributions, which is paid annually in arrears in October 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 or liquidation or bankruptcy the Company) occur. The Company has the right to defer current interest and all deferred interest. Huaneng Trust (3rd) has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 5th 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 6th year after the issuance, to the basis rate plus 300 basis points, and will remain 6.11% afterwards.

In November 2022, the company issued the fourth tranche of the Huaneng Trust Yingfeng No.1 Single Fund Trust ("Huaneng Trust (4th)") with the proceeds of RMB4,000 million. Huaneng Trust (4th) has no fixed period with initial distribution rate of 3.11%. The interest of Huaneng Trust (4th) is recorded as distributions, which is paid annually in arrears in October 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 or liquidation or bankruptcy the Company) occur. The Company has the right to defer current interest and all deferred interest. Huaneng Trust (4th) has no fixed maturity date and is callable at the Company's discretion in whole at each distribution date after the 5th 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 6th year after the issuance, to the basis rate plus 300 basis points, and will remain 6.11% afterwards.

The perpetual corporate bonds, financing plans and medium-term notes were recorded as other equity instruments in the consolidated financial statements. During the year ended 31 December 2022, the profit attributable to holders of other equity instruments, based on the applicable distribution rates, was RMB2,192 million (2021: RMB2,137 million).

(Amounts expressed in thousands of RMB unless otherwise stated)

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(c) Changes of other equity instruments during 2022

	As at 1 January 2022		Issuance		Cumulative distributions				As at 31 December 2022	
Type of instruments	Number	Amount	Number	Amount	Accrued distribution	Distribution payment	Redemption value	Other reduction	Number	Amount
Bond B	25,000,000	2,534,665	–	–	94,547	129,250	2,500,000.	38	–	–
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)	–	2,073,485	–	–	105,987	105,987	–	–	–	2,073,485
PICC Financing Plan (1st)	–	930,659	–	–	48,089	47,957	–	–	–	930,791
2019 medium-term notes (2nd)	20,000,000	2,008,058	–	–	64,833	81,600	2,000,000	8,709	–	–
2019 medium-term notes (3rd)	20,000,000	2,006,382	–	–	65,910	81,000	2,000,000	8,708	–	–
China Life Financing Plan (2nd)	–	2,263,804	–	–	115,715	115,715	–	–	–	2,263,804
PICC Financing Plan (2nd)	–	1,741,232	–	–	89,973	89,726	–	–	–	1,741,479
2019 medium-term notes (4th)	25,000,000	2,508,853	–	–	87,548	103,750	2,500,000	7,349	–	–
2019 medium-term notes (4th)	15,000,000	1,503,373	–	–	67,950	67,950	–	7,238	15,000,000	1,510,611
Bond C	20,000,000	2,055,687	–	–	71,600	71,600	–	24	20,000,000	2,055,711
Bond D	10,000,000	1,029,944	–	–	38,500	38,500	–	12	10,000,000	1,029,956
2020 medium-term notes (1st)	30,000,000	3,058,322	–	–	95,400	95,400	–	10,418	30,000,000	3,068,740
China Life Financing Plan (3rd)	–	3,575,653	–	–	171,930	171,930	–	–	–	3,575,653
PICC Financing Plan (3rd)	–	930,613	–	–	44,789	44,666	–	–	–	930,736
Bond E	25,000,000	2,553,517	–	–	77,250	77,250	–	29	25,000,000	2,553,546
2020 medium-term notes (2nd)	35,000,000	3,557,499	–	–	126,000	126,000	–	10,161	35,000,000	3,567,660
2020 medium-term notes (3rd)	20,000,000	2,024,834	–	–	79,800	79,800	–	4,682	20,000,000	2,029,516

21 OTHER EQUITY INSTRUMENTS *(Cont'd)*

(c) Changes of other equity instruments during 2022 *(Cont'd)*

Type of instruments	As at 1 January 2022		Issuance		Cumulative distributions				As at 31 December 2022	
	Number	Amount	Number	Amount	Accrued distribution	Distribution payment	Redemption value	Other reduction	Number	Amount
PICC Financing Plan (4th)	–	3,001,916	–	–	139,917	139,533	–	–	–	3,002,300
Bond F	30,000,000	3,040,643	–	–	131,400	131,400	–	37	30,000,000	3,040,680
2020 medium-term notes (4th)	10,000,000	1,009,992	–	–	44,000	44,000	–	2,907	10,000,000	1,012,899
2022 medium-term notes (5th)	–	–	20,000,000	2,000,000	26,169	–	–	–	20,000,000	2,026,169
2022 medium-term notes (8th)	–	–	5,000,000	500,000	4,608	–	–	–	5,000,000	504,608
2022 medium-term notes (9th)	–	–	20,000,000	2,000,000	12,034	–	–	–	20,000,000	2,012,034
2022 medium-term notes (10th)	–	–	20,000,000	2,000,000	10,284	–	–	–	20,000,000	2,010,284
2022 medium-term notes (11th)	–	–	25,000,000	2,500,000	10,749	–	–	–	25,000,000	2,510,749
Huaneng Trust (1st)	–	–	–	2,500,000	20,529	–	–	–	–	2,520,529
Huaneng Trust (2nd)	–	–	–	3,050,000	20,200	–	–	–	–	3,070,200
Huaneng Trust (3rd)	–	–	–	4,000,000	16,359	–	–	–	–	4,016,359
Huaneng Trust (4th)	–	–	–	4,000,000	16,359	–	–	–	–	4,016,359
Total	285,000,000	48,417,977	90,000,000	22,550,000	2,191,950	2,136,535	9,000,000	60,312	285,000,000	62,083,704

(Amounts expressed in thousands of RMB unless otherwise stated)

22 SURPLUS RESERVES

	As at 1 January 2022 and 31 December 2022
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 2022, 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 2022 and 2021, 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 2022, in accordance with PRC GAAP and IFRSs, the balances of retained earnings for the Group amounted to approximately RMB6.703 billion and RMB6.518 billion, respectively; and the balances of retained earnings for the Company amounted to RMB28.640 billion and RMB22.438 billion, respectively.

23 DIVIDENDS OF ORDINARY SHARES AND CUMULATIVE DISTRIBUTION OF OTHER EQUITY INSTRUMENTS

(a) Dividends of ordinary shares

On 28 June 2022, upon the approval from the annual general meeting of the shareholders, the Company declared no dividend in 2021 (2020: RMB0.18 per ordinary share, totalling approximately RMB2,826 million).

On 21 March 2023, the Board of Directors proposed no cash dividend for the year of 2022. 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 2022, the net profit attributable to holders of other equity instruments, based on the applicable rates, was RMB2,192 million, and the cumulative distribution paid in 2022 was RMB2,137 million.

24 LONG-TERM LOANS

Long-term loans comprised the following:

	As at 31 December	
	2022	2021
Loans from Huaneng Group and its subsidiaries (a)	8,342,593	9,483,974
Bank loans and other loans (b)	162,464,922	144,587,541
	170,807,515	154,071,515
Less: Current portion of long-term loans	19,129,989	17,213,799
Total	151,677,526	136,857,716

(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 2022				
	Original currency '000	RMB equivalent	Less: Current portion	Non-current portion	Annual interest rate
Loans from Huaneng Group					
Unsecured					
RMB					
– Variable rate	833,925	833,925	392	833,533	4.30%-4.65%
– Fixed rate	67,079	67,079	79	67,000	3.86%
Loans from Huaneng Finance					
Unsecured					
RMB					
– Variable rate	4,770,613	4,770,613	826,036	3,944,577	2.05%-4.40%
– Fixed rate	733,423	733,423	145,923	587,500	3.20%-4.28%
Loans from Huaneng Tiancheng Financial Leasing Co., Ltd. ("Tiancheng Financial Leasing")					
Secured					
RMB					
– Variable rate	305,436	305,436	46	305,390	3.80%-4.46%
– Fixed rate	317,811	317,811	18,860	298,951	3.45%-4.65%
Loans from Huaneng Group Hong Kong Asset Management Co., Ltd. ("Hong Kong Asset Management")					
Unsecured					
US$					
– Variable rate	188,712	1,314,306	12,235	1,302,071	3.85%-6.75%
Total		8,342,593	1,003,571	7,339,022	

24 LONG-TERM LOANS *(Cont'd)*

(a) Loans from Huaneng Group and its subsidiaries *(Cont'd)*

	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 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					
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	

(Amounts expressed in thousands of RMB unless otherwise stated)

24 LONG-TERM LOANS *(Cont'd)*

(b) Bank loans and other loans

	As at 31 December 2022				
	Original currency '000	RMB equivalent	Less: Current portion	Non-current portion	Annual interest rate
Secured					
RMB					
– Fixed rate	559,347	559,347	40,347	519,000	3.15%-4.66%
– Variable rate	8,126,376	8,126,376	1,716,202	6,410,174	2.15%-4.95%
S$					
– Variable rate	129,875	673,155	20,655	652,500	4.40%
Unsecured					
RMB					
– Fixed rate	6,387,039	6,387,039	603,001	5,784,038	1.82%-4.75%
– Variable rate	132,509,708	132,509,708	14,277,235	118,232,473	1.75%-4.90%
US$					
– Fixed rate	302,853	2,109,248	20,510	2,088,738	3.50%
– Variable rate	1,002,989	6,985,420	1,120,414	5,865,006	3.75%-4.63%
S$					
– Variable rate	962,611	4,989,308	305,511	4,683,797	4.40%-4.70%
€					
– Fixed rate	2,455	18,226	16,540	1,686	2.00%-2.15%
JPY					
– Fixed rate	2,043,796	107,095	6,003	101,092	0.75%
Total		162,464,922	18,126,418	144,338,504	

24 LONG-TERM LOANS *(Cont'd)*

(b) Bank loans and other loans *(Cont'd)*

	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	

As at 31 December 2022, long-term loans of approximately RMB4,794 million were secured by future revenue from the electricity business (31 December 2021: RMB4,516 million). Long-term loans of approximately RMB461 million (31 December 2021: approximately RMB2,814 million) were secured by equity interests of the Company and its subsidiaries. Long-term loans of approximately RMB50 million were secured by carbon emission trading rights (31 December 2021: approximately RMB20 million). Long-term loans of approximately RMB44 million were secured by franchise (31 December 2021: nil).

As at 31 December 2022, long-term loans of RMB4,633 million (31 December 2021: RMB4,595 million) were secured by certain property, plant and equipment with a net book value amounting to approximately RMB6,984 million (31 December 2021: RMB5,025 million).

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 2022, the equipment mentioned above had total carrying amounts of RMB1,152 million and RMB5,832 million (31 December 2021: RMB858 million and RMB4,111 million) respectively, which were recognised in property, plant and equipment.

As at 31 December 2022, long-term loans of approximately RMB15 million (31 December 2021: RMB44 million) were guaranteed by Huaneng Group.

As at 31 December 2022, the Company provided guarantees for long-term loans of approximately RMB3,109 million (31 December 2021: RMB6,257 million) of the Company's overseas subsidiaries and RMB237 million of the Company's domestic subsidiaries (31 December 2021: nil).

As at 31 December 2022, long-term loans of approximately RMB107 million (31 December 2021: RMB120 million) were guaranteed by Enshi Finance Bureau of Hubei Province.

As at 31 December 2022, long-term loans of approximately RMB106 million (31 December 2021: nil) were guaranteed by Tangyin County Modern Agricultural Investment Co., Ltd.

As at 31 December 2022, long-term loans of approximately RMB199 million (approximately US$29 million) (31 December 2021: RMB176 million (approximately US$28 million)) were guaranteed by Shandong Power.

As at 31 December 2022, long-term loans of approximately RMB6,766 million (31 December 2021: RMB6,794 million) were guaranteed by Shandong Power, China Export & Credit Insurance Corporation and Jining Chengtou Holding Group Co., Ltd. ("Jining Chengtou") at the liability ratios of 17.5%,65.0% and 17.5% respectively (31 December 2021: Shandong Power, China Export & Credit Insurance Corporation and Jining Chengtou at the liability ratios of 17.5%,65.0% and 17.5% respectively).

As at 31 December 2022, long-term loans of approximately RMB1,116 million (31 December 2021: RMB1,020 million) were guaranteed by Shandong Power and Jining Chengtou at the liability ratios of 50.0% and 50.0% respectively (31 December 2021: Shandong Power and Jining Chengtou at the liability ratios of 50.0% and 50.0% respectively).

24 LONG-TERM LOANS *(Cont'd)*

(b) Bank loans and other loans *(Cont'd)*

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	
	2022	2021	**2022**	2021
Within 1 year	**1,003,571**	1,203,420	**18,126,418**	16,010,379
After 1 year but within 2 years	**1,586,026**	2,032,272	**29,329,077**	23,480,443
After 2 years but within 5 years	**2,066,164**	4,361,292	**61,589,870**	56,017,602
After 5 years	**3,686,832**	1,886,990	**53,419,557**	49,079,117
	8,342,593	9,483,974	**162,464,922**	144,587,541
Less: amount due within 1 year included under current liabilities	**1,003,571**	1,203,420	**18,126,418**	16,010,379
Total	**7,339,022**	8,280,554	**144,338,504**	128,577,162

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	
	2022	2021
Within 1 year	**24,227,399**	22,545,617
After 1 year but within 2 years	**35,505,690**	30,588,971
After 2 years but within 5 years	**72,096,135**	70,138,254
After 5 years	**71,470,025**	78,319,136
	203,299,249	201,591,978

(Amounts expressed in thousands of RMB unless otherwise stated)

25 LONG-TERM BONDS

Outstanding corporate bonds, medium-term notes and debt financing instruments (including long-term bonds due within one year) of the Group as at 31 December 2022 are summarised as follows:

Type of Instruments	Face Value	Issuance Date	Initial Period	Initial Distribution Rate	Effective Rate	Issue Price	Balance as at 31 December 2021	Issued Amount	Amortisation	Interest	Repayment	Foreign Exchange Gain	Foreign Currency Translation Differences	Interest Payable	Balance as at 31 December 2022
2016 corporate bonds (5 years)	3,000,000	June 2016	5 years	3.48%	3.48%	3,000,000	9	-	(9)	-	-	-	-	-	-
2016 corporate bonds (10 years)	1,200,000	June 2016	10 years	3.98%	3.98%	1,200,000	1,226,442	-	12	47,760	(47,760)	-	-	26,430	1,226,454
2017 medium-term notes (5 years)	5,000,000	July 2017	5 years	4.69%	4.90%	5,000,000	5,114,928	-	5,181	123,353	(5,234,500)	-	-	-	8,962
2018 medium-term notes (3 years)	2,000,000	July 2018	3 years	4.41%	4.56%	2,000,000	2,799	-	-	-	-	-	-	-	2,799
2018 corporate bonds (10 years)	5,000,000	September 2018	10 years	5.05%	5.05%	5,000,000	5,078,224	-	30	252,500	(252,500)	-	-	78,171	5,078,254
2019 corporate bonds (10 years)	2,300,000	April 2019	10 years	4.70%	4.70%	2,300,000	2,374,948	-	14	108,100	(108,100)	-	-	74,930	2,374,962
2019 corporate bonds (3 years)	1,000,000	July 2019	3 years	3.55%	3.55%	1,000,000	1,017,160	-	(42)	18,382	(1,035,500)	-	-	-	-
2019 medium-term notes (3 years)	500,000	July 2019	3 years	3.55%	3.65%	500,000	507,807	-	266	9,677	(517,750)	-	-	-	-
2019 medium-term notes (5 years)	1,500,000	July 2019	5 years	3.85%	3.96%	1,500,000	1,522,587	-	1,444	57,750	(57,750)	-	-	26,264	1,524,031
2020 corporate bonds (5 years)	2,108,865	February 2020	5 years	2.25%	2.32%	2,108,865	1,920,795	-	329	47,714	(47,810)	(11,250)	190,468	17,493	2,100,246
2020 corporate bonds (10 years)	2,108,865	February 2020	10 years	2.63%	2.72%	2,108,865	1,915,197	-	406	55,666	(55,778)	(11,250)	190,732	20,409	2,094,973
2021 green medium-term notes (3 years)	1,000,000	February 2021	3 years	3.45%	3.66%	1,000,000	1,030,612	-	1,887	34,500	(34,500)	-	-	30,814	1,032,499
2021 green medium-term notes (3 years)	2,500,000	April 2021	3 years	3.35%	3.40%	2,500,000	2,559,318	-	707	83,750	(83,750)	-	-	59,658	2,560,025
2021 corporate bonds (3 years)	500,000	May 2021	3 years	3.35%	3.35%	500,000	510,189	-	10	16,750	(16,750)	-	-	10,188	510,199
2021 corporate bonds (10 years)	1,500,000	May 2021	10 years	3.97%	3.97%	1,500,000	1,536,212	-	9	59,550	(59,550)	-	-	36,219	1,536,221
2021 corporate bonds (3 years)	500,000	June 2021	3 years	3.33%	3.33%	500,000	509,489	-	10	16,650	(16,650)	-	-	9,488	509,499
2021 corporate bonds (10 years)	3,500,000	June 2021	10 years	3.97%	3.97%	3,500,000	3,579,163	-	21	138,950	(138,950)	-	-	79,182	3,579,184
2021 corporate bonds (10 years)	1,800,000	June 2021	10 years	3.99%	3.99%	1,800,000	1,838,162	-	11	71,820	(71,820)	-	-	38,173	1,838,173
2021 medium-term notes (3 years)	2,000,000	August 2021	3 years	2.99%	3.01%	2,000,000	2,022,070	-	500	59,800	(59,800)	-	-	22,282	2,022,570
2021 medium-term notes (3 years)	2,000,000	November 2021	3 years	3.07%	3.07%	2,000,000	2,006,225	-	(183)	61,400	(61,400)	-	-	6,224	2,006,042
2021 medium-term notes (3 years)	300,000	December 2021	3 years	2.95%	2.95%	300,000	300,123	-	-	8,848	(8,850)	-	-	121	300,121
2022 medium-term notes (10 years)	1,500,000	February 2022	10 years	3.74%	3.80%	1,500,000	-	1,500,000	528	47,647	-	-	-	47,647	1,548,175
2022 medium-term notes (3 years)	3,000,000	March 2022	3 years	2.84%	2.89%	3,000,000	-	3,000,000	(3,140)	70,728	-	-	-	70,728	3,067,588
2022 medium-term notes (10 years)	1,500,000	April 2022	10 years	3.70%	3.76%	1,500,000	-	1,500,000	418	38,622	-	-	-	38,622	1,539,040
2022 medium-term notes (3 years)	500,000	April 2022	3 years	2.92%	2.92%	500,000	-	500,000	-	10,000	-	-	-	10,000	510,000
2022 medium-term notes (2 years)	300,000	June 2022	2 years	2.37%	2.40%	300,000	-	300,000	25	3,740	-	-	-	3,740	303,765
2022 medium-term notes (3 years)	2,000,000	August 2022	3 years	2.40%	2.51%	2,000,000	-	2,000,000	(4,974)	19,595	-	-	-	19,595	2,014,621
2022 medium-term notes (2 years)	500,000	August 2022	2 years	2.14%	2.17%	500,000	-	500,000	22	3,958	-	-	-	3,958	503,980
Total						50,617,730	36,572,459	9,300,000	3,482	1,467,210	(7,909,468)	(22,500)	381,200	730,336	39,792,383

25 LONG-TERM BONDS *(Cont'd)*

Outstanding corporate bonds, medium-term notes and debt financing instruments (including long-term bonds due within one year) of the Group as at 31 December 2021 are summarised as follows:

Type of Instruments	Face Value	Issuance Date	Initial Period	Initial Distribution Rate	Effective Rate	Issue Price	Balance as at 31 December 2020	Issued Amount	Amortisation	Interest	Repayment	Foreign Exchange Gain	Foreign Currency Translation Differences	Interest Payable	Balance as at 31 December 2021
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 green 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 green 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 medium-term notes (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 medium-term notes (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 notes (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

(Amounts expressed in thousands of RMB unless otherwise stated)

25 LONG-TERM BONDS *(Cont'd)*

As at 31 December 2022, the Company provided guarantees for long-term bonds of approximately RMB4,179 million (31 December 2021: RMB3,826 million) of the Company's overseas subsidiary.

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	
	2022	2021
Within 1 year	**2,110,625**	8,457,746
After 1 year but within 2 years	**1,141,603**	1,277,140
After 2 years but within 5 years	**22,427,334**	16,048,337
After 5 years	**21,252,990**	18,405,291
	46,932,552	44,188,514

26 OTHER NON-CURRENT LIABILITIES

	As at 31 December	
	2022	2021
Government grants		
– Environmental subsidies (a)	**1,062,278**	1,103,425
– Other government grants (b)	**780,123**	1,089,689
Contract liabilities	**2,898,664**	2,894,543
Repurchase obligation (c)	**1,216,411**	–
Other deferred income	**27,164**	33,432
Others (d)	**883,858**	969,900
Subtotal	**6,868,498**	6,090,989
Current portion of other non-current liabilities	**(73,694)**	(68,972)
Subtotal	**(73,694)**	(68,972)
Total	**6,794,804**	6,022,017

(a) This primarily represented subsidies for the construction of desulphurisation equipment and other environmental protection projects.

(b) As at 31 December 2022, among other government grants, there was standby compensation of Huaneng Power International, Inc. Jining Power Plant amounting to RMB403 million (31 December 2021: RMB793 million) with unfulfilled conditions.

26 OTHER NON-CURRENT LIABILITIES *(Cont'd)*

(c) As at 31 December 2022, repurchase obligation to Hong Kong Asset Management amounted to RMB1.216 billion (31 December 2021: nil).

(d) As at 31 December 2022, included in others, there were financial liabilities amounting to RMB792 million (31 December 2021: RMB887 million), which were comprised of mining right payables, guarantee deposits, poverty relief payables, etc.

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	
	2022	2021
Within 1 year	**94,363**	90,847
After 1 year but within 2 years	**146,907**	104,837
After 2 years but within 5 years	**61,479**	175,691
After 5 years	**560,539**	669,985
	863,288	1,041,360

27 ACCOUNTS PAYABLE AND OTHER LIABILITIES

Accounts payable and other liabilities comprised of:

	As at 31 December	
	2022	2021
Accounts and notes payables	**24,367,693**	25,774,238
Payables to contractors for construction	**21,443,219**	19,922,953
Retention payables to contractors	**1,773,257**	1,795,819
Consideration payables for acquiring a subsidiary	**22,842**	22,842
Others	**6,865,690**	7,093,701
Total	**54,472,701**	54,609,553

Please refer to Note 36(a)(iv) for details of accounts payable based on the invoice date and other liabilities due to the related parties.

As at 31 December 2022, there were notes payable amounting to RMB22 million (31 December 2021: RMB7 million) secured by notes receivable.

As at 31 December 2022 and 31 December 2021, the accounts and notes payables and other liabilities are non-interest-bearing.

(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	
	2022	2021
RMB	**49,619,219**	50,956,022
S$ (RMB equivalent)	**2,047,597**	1,537,356
US$ (RMB equivalent)	**2,146,746**	576,113
JPY (RMB equivalent)	**16,700**	13,988
PKR (RMB equivalent)	**642,426**	1,526,074
GBP (RMB equivalent)	**13**	–
Total	**54,472,701**	54,609,553

The ageing analysis of accounts and notes payable was as follows:

	As at 31 December	
	2022	2021
Within 1 year	**23,857,045**	25,271,613
Between 1 to 2 years	**368,324**	373,752
Over 2 years	**142,324**	128,873
Total	**24,367,693**	25,774,238

28 TAXES PAYABLE

Taxes payable comprise:

	As at 31 December	
	2022	2021
VAT payable	**759,127**	955,497
Income tax payable	**331,928**	227,880
Others	**556,318**	870,041
Total	**1,647,373**	2,053,418

29 SHORT-TERM BONDS

Outstanding short-term bonds as at 31 December 2022 are summarised as follows:

Type of Instruments	Face Value	Issuance Date	Maturity	Issue Price	Coupon Rate	Balance as at 31 December 2021	Issued Amount	Interest	Amortisation	Repayment	Balance as at 31 December 2022
Super short-term bond (2021 16th)	5,000,000	November 2021	98 days	5,000,000	2.38%	5,018,932	–	13,367	(22)	(5,032,277)	–
Super short-term bond (2021 17th)	3,000,000	December 2021	29 days	3,000,000	2.22%	3,003,542	–	2,007	(75)	(3,005,474)	–
Super short-term bond (2021 18th)	2,000,000	January 2022	58 days	2,000,000	2.10%	–	2,000,000	6,674	–	(2,006,674)	–
Super short-term bond (2022 1st)	2,000,000	January 2022	46 days	2,000,000	2.08%	–	2,000,000	5,243	–	(2,005,243)	–
Super short-term bond (2022 2nd)	2,000,000	February 2022	41 days	2,000,000	2.00%	–	2,000,000	4,493	–	(2,004,493)	–
Super short-term bond (2022 3rd)	2,000,000	February 2022	32 days	2,000,000	2.00%	–	2,000,000	3,507	–	(2,003,507)	–
Super short-term bond (2022 4th)	2,000,000	March 2022	90 days	2,000,000	2.00%	–	2,000,000	9,863	–	(2,009,863)	–
Super short-term bond (2022 5th)	3,000,000	July 2022	29 days	3,000,000	1.54%	–	3,000,000	3,671	–	(3,003,671)	–
Super short-term bond (2022 6th)	3,000,000	July 2022	32 days	3,000,000	1.54%	–	3,000,000	4,050	–	(3,004,050)	–
Super short-term bond (2022 7th)	2,000,000	July 2022	58 days	2,000,000	1.48%	–	2,000,000	4,704	–	(2,004,704)	–
Super short-term bond (2022 8th)	2,500,000	August 2022	90 days	2,500,000	1.47%	–	2,500,000	9,062	–	(2,509,062)	–
Super short-term bond (2022 9th)	2,000,000	September 2022	35 days	2,000,000	1.25%	–	2,000,000	2,397	–	(2,002,397)	–
Super short-term bond (2022 10th)	2,000,000	September 2022	37 days	2,000,000	1.25%	–	2,000,000	2,534	–	(2,002,534)	–
Super short-term bond (2022 11th)	3,000,000	October 2022	32 days	3,000,000	1.48%	–	3,000,000	3,893	–	(3,003,893)	–
Super short-term bond (2022 12th)	3,000,000	October 2022	33 days	3,000,000	1.47%	–	3,000,000	3,987	–	(3,003,987)	–
Super short-term bond (2022 13th)	3,000,000	November 2022	32 days	3,000,000	1.53%	–	3,000,000	4,024	–	(3,004,024)	–
Super short-term bond (2022 14th)	3,000,000	November 2022	61 days	3,000,000	2.09%	–	3,000,000	7,558	35	–	3,007,593
Super short-term bond (2022 15th)	2,000,000	November 2022	30 days	2,000,000	1.73%	–	2,000,000	2,844	–	(2,002,844)	–
Super short-term bond (2022 16th)	3,000,000	December 2022	34 days	3,000,000	1.83%	–	3,000,000	3,610	19	–	3,003,629
Super short-term bond (JiangSu2021 1st)	200,000	December 2021	270 days	200,000	2.60%	200,043	–	–	–	(200,043)	–
Super short-term bond (JiangSu2022 2nd)	300,000	September 2022	180 days	300,000	1.66%	–	300,000	1,555	–	–	301,555
Total				50,000,000		8,222,517	41,800,000	99,043	(43)	(43,808,740)	6,312,777

(Amounts expressed in thousands of RMB unless otherwise stated)

29 SHORT-TERM BONDS *(Cont'd)*

Outstanding short-term bonds as at 31 December 2021 are summarised as follows:

Type of Instruments	Face Value	Issuance Date	Maturity	Issue Price	Coupon Rate	Balance as at 31 December 2020	Issued Amount	Interest	Amortisation	Repayment	Balance as at 31 December 2021
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

30 SHORT-TERM LOANS

Short-term loans are as follows:

	As at 31 December 2022			As at 31 December 2021		
	Original currency '000	RMB equivalent	Annual interest rate	Original currency '000	RMB equivalent	Annual interest rate
Secured						
RMB						
– Fixed rate	1,132,149	1,132,149	1.24%-3.65%	775,945	775,945	2.00%-4.24%
– Variable rate	–	–	–	439,754	439,754	2.35%-4.96%
Unsecured						
RMB						
– Fixed rate	21,653,365	21,653,365	1.45%-3.92%	21,765,522	21,765,522	2.55%-4.35%
– Variable rate	60,500,568	60,500,568	1.65%-4.00%	68,767,248	68,767,248	2.80%-4.35%
SGD						
– Variable rate	200	1,037	5.50%	–	–	–
PKR						
– Variable rate	9,328,289	286,378	18.01%	4,100,000	148,256	11.35%
Total		83,573,497			91,896,725	

As at 31 December 2022, short-term loans of RMB361 million (31 December 2021: RMB829 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 2022, short-term loans of RMB772 million (31 December 2021: RMB387 million) were secured by certain equipment with a net book value amounting to approximately RMB1,519 million (31 December 2021: RMB475 million).

As at 31 December 2022, short-term loans of RMB286 million were guaranteed by Shandong Luyi Power International Limited Company ("Luyi International") (31 December 2021: RMB148 million).

As at 31 December 2022, short-term loans of RMB50 million borrowed from Hong Kong Asset Management (31 December 2021: nil) with annual interest rates 3.30%. Short-term loans borrowed from Huaneng Finance amounted to RMB15,912 million (31 December 2021: RMB9,432 million) with annual interest rates ranging from 2.00% to 3.92% (31 December 2021: from 2.90% to 4.10%). Short-term loans borrowed from Tiancheng Financial Leasing amounted to RMB772 million (31 December 2021: RMB387 million) with annual interest rates ranging from 3.00% to 3.60% (31 December 2021: 3.75% to 4.24%). Short-term loans borrowed from Huaneng Group amounted to RMB250 million (31 December 2021: RMB2,294 million) with annual interest rates 2.05% (31 December 2021: 3.58%).

(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	
	2022	2021
Deferred income tax assets before offsetting	**7,261,129**	6,301,920
Offset amount	**(1,628,420)**	(1,394,839)
Deferred income tax assets after offsetting	**5,632,709**	4,907,081
Deferred income tax liabilities before offsetting	**(3,798,261)**	(3,694,927)
Offset amount	**1,628,420**	1,394,839
Deferred income tax liabilities after offsetting	**(2,169,841)**	(2,300,088)
	3,462,868	2,606,993

The gross movements in the deferred income tax accounts are as follows:

	2022	2021
Beginning of the year	**2,606,993**	(303,132)
Business combination	**16,066**	–
Credited to profit or loss (Note 33)	**723,167**	2,969,675
(Charged)/credited to other comprehensive income	**196,605**	(91,641)
Currency translation differences	**(79,963)**	32,091
End of the year	**3,462,868**	2,606,993

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 2021	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
Business Combination	–	–	(7,564)	–	–	–	–	1,971	–	22,290	16,697
(Charged)/credited to profit or loss	–	–	(368)	(87,388)	(110,489)	311	(5,945)	1,119,705	(13,267)	(57,404)	845,155
(Charged)/credited to other comprehensive income	91,343	3,323	–	–	–	–	–	–	–	–	94,666
Currency translation differences	(28)	–	–	1,660	–	–	–	–	–	1,059	2,691
As at 31 December 2022	109,986	139,000	3,874	603,589	701,704	21,627	42,257	4,757,858	5,673	875,561	7,261,129

(Amounts expressed in thousands of RMB unless otherwise stated)

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 2021	–	(6,299)	(906,650)	(2,174,844)	(672,347)	(129,383)	(2,409)	(4,779)	(14,356)	(3,911,067)
(Charged)/credited to profit or loss	–	–	116,517	260,875	–	–	2,409	(5,843)	(86,215)	287,743
(Charged)/credited 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)
Business Combination	–	–	–	(157)	–	–	–	–	(474)	(631)
(Charged)/credited to profit or loss	–	–	89,990	(221,319)	–	–	–	(7,683)	17,024	(121,988)
(Charged)/credited to other comprehensive income	101,084	855	–	–	–	–	–	–	–	101,939
Currency translation differences	3,211	–	–	(22,440)	(63,425)	–	–	–	–	(82,654)
As at 31 December 2022	–	(4,968)	(700,143)	(2,154,778)	(706,663)	(129,383)	–	(18,305)	(84,021)	(3,798,261)

31 DEFERRED INCOME TAX ASSETS AND LIABILITIES *(Cont'd)*

As at 31 December 2022 and 2021, taxable temporary differences relating to interests in equity method investees amounted to RMB5.36 billion and RMB4.85 billion, respectively. No deferred tax liabilities were recognised as at 31 December 2022 and 2021 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 2022 and 2021, taxable temporary differences relating to the interests in foreign subsidiaries amounted to RMB2.38 billion and RMB2.34 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 2022 and 2021 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	
	2022	2021
Deductible temporary differences	**18,604,340**	16,076,139
Unused tax losses	**30,446,809**	19,919,286
Total	**49,051,149**	35,995,425

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	
	2022	2021
Year of expiry		
2022	**–**	2,415,361
2023	**2,607,668**	2,649,192
2024	**2,737,169**	2,794,796
2025	**1,981,365**	1,937,943
2026	**12,532,958**	10,121,994
2027	**10,587,649**	–
Total	**30,446,809**	19,919,286

(Amounts expressed in thousands of RMB unless otherwise stated)

32 ADDITIONAL FINANCIAL INFORMATION TO THE CONSOLIDATED STATEMENT OF FINANCIAL POSITION

As at 31 December 2022, the net current liabilities of the Group amounted to approximately RMB84,611 million (31 December 2021: RMB93,927 million). On the same date, total assets less current liabilities were approximately RMB340,888 million (31 December 2021: RMB314,651 million (restated)).

33 INCOME TAX EXPENSE

	For the year ended 31 December	
	2022	2021
Current income tax expense	**881,825**	1,039,920
Deferred income tax (Note 31)	**(723,167)**	(2,969,675)
Total	**158,658**	(1,929,755)

No Hong Kong profits tax has been provided as there were no estimated assessable profits in Hong Kong for the year (2021: 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 2022 and 2021.

The income tax rate applicable to Singapore subsidiaries is 17% (2021: 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. 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) Turn over tax at 1.25% of 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. (i) 10 years in the case of ACT; (ii) The carry forward time period is 3 years in the case of turn over tax.

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	
	2022	2021 (Restated)
PRC statutory enterprise income tax rate	25.00%	25.00%
Effect of different tax rates of certain subsidiaries	10.44%	6.33%
Utilisation of previously unrecognised tax losses and deductible temporary differences	2.60%	2.01%
Unrecognised tax losses for the year	(27.58%)	(17.28%)
Unrecognised deductible temporary differences	(8.87%)	(3.22%)
Effect of non-taxable income	2.36%	1.06%
Effect of non-deductible expenses	(3.29%)	(1.08%)
Others	(2.13%)	0.16%
Effective tax rate	(1.47%)	12.98%

For the year ended 31 December 2022, the effective tax rate was proportioned by income tax expense to loss before tax (for the year ended 31 December 2021: income tax credit to loss before tax).

34 LOSSES 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	
	2022	2021 (Restated)
Consolidated net loss attributable to equity holders of the Company	(8,026,233)	(10,377,939)
Less: cumulative distribution of other equity instruments	2,191,950	2,137,420
Consolidated net loss attributable to ordinary shareholders of the Company	(10,218,183)	(12,515,359)
Weighted average number of the Company's outstanding ordinary shares ('000) *	15,698,093	15,698,093
Basic and diluted loss per share (RMB)	(0.65)	(0.80)

(Amounts expressed in thousands of RMB unless otherwise stated)

34 LOSSES PER SHARE *(Cont'd)*

* Weighted average number of ordinary shares:

	2022 '000	2021 '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 2022 and 2021.

35 NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS

Bank balances and cash comprise the following:

	As at 31 December	
	2022	2021
Total bank balances and cash	**17,175,575**	16,350,332
Less: Restricted cash	**658,467**	795,507
Cash and cash equivalents as at year end	**16,517,108**	15,554,825

The bank balances and cash of the Group are denominated in the following currencies:

	As at 31 December	
	2022	2021
RMB	**14,400,682**	14,157,467
S$ (RMB equivalent)	**1,403,364**	698,923
US$ (RMB equivalent)	**866,481**	1,338,238
Others	**505,048**	155,704
Total	**17,175,575**	16,350,332

During the year, the Group had non-cash additions to right-of-use assets and lease liabilities of RMB1,690 million and RMB1,690 million, respectively, in respect of lease arrangements (2021: RMB3,194 million and RMB3,194 million).

35 NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS *(Cont'd)*

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:

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 2022	245,968,240	44,794,976	409,656	6,939,367	1,041,452
(a) Business combination	579,819	–	–	–	–
(b) Changes from financing cash flows:					
Proceeds from new bank loans	224,196,815	–	–	–	–
Repayment of bank loans	(217,309,630)	–	–	–	–
Proceeds from new bonds	–	51,100,000	–	–	–
Repayment of bonds	–	(50,200,000)	–	–	–
Payment of lease liabilities	–	–	–	(2,327,866)	–
Interest paid	(9,358,911)	(1,518,208)	(2,136,535)	–	–
Dividends paid to shareholders of the Company	–	–	–	–	(1,343,510)
Others	–	(13,469)	–	–	–
(c) Exchange adjustments	1,230,538	358,701	–	17,369	–
(d) Other changes:					
New leases	–	–	–	1,689,566	–
Interest expenses	8,080,167	1,583,160	–	298,798	–
Accrued cumulative distribution of other equity instrument investments	–	–	2,191,950	–	–
Capitalised borrowing costs	993,974	–	–	14,641	–
Dividends declared	–	–	60,312	–	919,634
As at 31 December 2022	254,381,012	46,105,160	525,383	6,631,875	617,576

(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 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	
	2022	2021
Within financing activities*	**2,327,866**	1,860,532
Total	**2,327,866**	1,860,532

* During the year, the principal portion of lease liabilities paid was RMB2,328 million (2021: RMB1,486 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
Sichuan Energy Development and its subsidiaries	An associate of the Company and also a subsidiary of Huaneng Group
Shanghai Ruining Shipping Co., Ltd.	An associate of the Company and also a subsidiary of Huaneng Group
Huaneng Supply Chain Platform Technology Co., Ltd.	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

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

Names of related parties	Nature of relationship
Chongqing Luoyu Environmental Protection Technology Co., Ltd.	An associate of the Company
Suzhou Sugao Renewables Service Co. Ltd.	An associate of the Company
Fujian Gulei Energy Technology Co. Ltd.	An associate of the Company
Chongqing Huaneng Stone Powder Co. Ltd.	An associate of the Company
Luyin (Shouguang) New Energy Co. Ltd.	An associate of the Company
Taiyuan Dongshan Petrochina Kunlun Gas Co., Ltd.	An associate of the Company
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 and its subsidiaries	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
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

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

Names of related parties	Nature of relationship
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
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*	Note 9
Other government-related enterprises**	Related parties of the Company

* Huangtai #8 Power Plant was acquired by Shandong Power, a subsidiary of the Company, as at 31 December 2022. The transaction with Huangtai #8 Power Plant before the acquisition date was disclosed accordingly.

** 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.

(Amounts expressed in thousands of RMB unless otherwise stated)

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(a) Related party balances

(i) Cash deposits in related parties

	As at 31 December	
	2022	2021
Deposits in Huaneng Finance		
– Savings deposits	**12,996,034**	13,372,802

For the year ended 31 December 2022, the annual interest rates for these savings deposits (as included in bank balances and cash) ranged from 0.35% to 3.30% (2021: from 0.35% to 3.30%).

(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 2022 and 2021, 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	
	2022	2021
Due from Huaneng Group	**36,929**	53,838
Due from HIPDC	**401**	301
Due from associates	**89,798**	97,796
Due from joint ventures	**371,933**	301,181
Due from subsidiaries of Huaneng Group	**1,652,236**	916,107
Due from Huangtai #8 Power Plant	**–**	896,118
Total	**2,151,297**	2,265,341

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	
	2022	2021
Due to Huaneng Group	**16,746**	99,824
Due to HIPDC	**24,668**	14,096
Due to associates	**101,057**	3,616
Due to joint ventures	**141,032**	144,887
Due to subsidiaries of Huaneng Group	**16,175,270**	18,693,797
Total	**16,458,773**	18,956,220

(v) As at 31 December 2022, included in long-term loans (including current portion) and short-term loans are loans payable to other government-related financial institutions amounting to RMB229.0 billion (31 December 2021: RMB224.9 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.

(Amounts expressed in thousands of RMB unless otherwise stated)

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	
	2022	2021
Huaneng Group		
Technical services and engineering contracting services	**140**	–
Other purchases	**545**	499
Subsidiaries of Huaneng Group		
Purchase of coal and transportation services	**91,835,902**	78,459,308
Technical services, engineering contracting services and others	**2,114,864**	2,305,752
Purchase of equipment	**785,072**	571,014
Purchase of carbon emission reduction resources and related services	**57,049**	–
Joint ventures of the Group		
Purchase of coal and transportation services	**643,466**	624,477
Technical services and engineering contracting services	**3,226**	–
Associates of the Group		
Purchase of equipment	**16,649**	–
Purchase of coal and transportation services	**1,486,520**	18,040

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	
	2022	2021
Huaneng Group		
Services provided	**121,105**	107,726
HIPDC		
Services provided	**376**	529
Subsidiaries of Huaneng Group		
Service provided	**286,370**	249,702
Sales of heat	**63,620**	56,122
Other sales	**–**	4,380
Sales of coal and transportation services	**14,822**	104,017
Sales of carbon emission reduction resources and related services	**463,900**	–
Joint ventures of the Group		
Service provided	**101,237**	97,265
Other sales	**4,552**	16,220
Associates of the Group		
Sales of heat	**38,915**	33,919
Other sales	**1,207**	–

(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

(1) Rental charge paid

Lessor name	Types of leased assets	Rental charges for short-term leases and leases of low-value assets for simplified processing (if applicable) For the year ended 31 December 2022	2021	Variable lease payments not included in the measurement of the lease liability (if applicable) For the year ended 31 December 2022	2021	Rent paid For the year ended 31 December 2022	2021	Assume interest expense on lease liability For the year ended 31 December 2022	2021	Increase in right-of-use assets For the year ended 31 December 2022	2021
HIPDC	Transmission and transformation facilities	47,947	47,947	–	–	–	–	–	–	–	–
HIPDC	Land	–	–	–	–	2,104	2,104	1,487	863	–	–
HIPDC	Office building	7,959	7,667	–	–	–	–	–	–	–	–
Subsidiaries of Huaneng Group	Office building	55,231	58,254	–	–	40,551	1,891	964	1,855	2,106	–
Subsidiaries of Huaneng Group	Mechanical equipment	–	–	–	–	1,391,684	2,231,187	99,989	118,569	763,958	1,379,610
Total		111,137	113,868	–	–	1,434,339	2,235,182	102,440	121,287	766,064	1,379,610

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	
	2022	2021
(2) Rental income received		
Huaneng group	612	–
A joint venture of the Group	6,612	6,612
Subsidiaries of Huaneng Group	9,120	4,938
Huangtai #8 Power Plant	14,952	17,594
(3) Net loans received (repaid to)/from		
Huaneng Group	(3,430,692)	3,166,000
Subsidiaries of Huaneng Group	7,042,913	940,550
A joint venture of the Group	(150,000)	–
(4) Interest expense on loans		
Huaneng Group	7,181	68,135
A joint venture of the Group	–	5,402
Subsidiaries of Huaneng Group	635,675	549,502
(5) Interest income on loans		
Joint ventures of the Group	3,860	5,091
(6) Provision of entrusted loans		
A joint venture of the Group	–	75,000
(7) Recover the entrusted loans		
A joint venture of the Group	3,000	304,000
(8) Capital injection from		
Subsidiaries of Huaneng Group	2,603,222	218,046

(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	
	2022	2021
(9) Capital injection to		
Subsidiaries of Huaneng Group	156,750	454,117
Associates of the Group	68,000	316,606
Joint ventures of the Group	10,000	81,600
(10) Entrusted management fee		
Huaneng Group	13,697	14,800
(11) Trusteeship management income		
Huaneng Group	26,548	5,226
Huangtai #8 Power Plant	–	1,962
(12) Net operating advances (paid to)/received from an investee with significant influence		
Huangtai #8 Power Plant	40,020	(240,271)
(13) Interest expense on trust loans		
Subsidiaries of Huaneng Group	73,449	–

Transactions with government-related enterprises

For the years ended 31 December 2022 and 2021, 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 2022 and 2021, 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	
	2022	2021
Long-term loans guaranteed by		
– Huaneng Group	14,927	43,555
Short-term loans guaranteed by		
– Joint ventures of the Group	286,378	148,256

36 RELATED PARTY BALANCES AND TRANSACTIONS *(Cont'd)*

(d) Pre-tax benefits and social insurance of key management personnel

	For the year ended 31 December	
	2022	2021
Salaries	**8,357**	9,333
Pension	**1,691**	1,616
Total	**10,048**	10,949

(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	
	2022	2021
Subsidiaries of Huaneng Group	**3,230,911**	1,044,526

(ii) Fuel purchase and transportation commitments

	As at 31 December	
	2022	2021
Subsidiaries of Huaneng Group	**2,738,965**	5,149,896
A joint venture of the Group	**10,457**	16,921

(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 2022.

(Amounts expressed in thousands of RMB unless otherwise stated)

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% (2021: 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 2022 were approximately RMB1,504 million (2021: RMB1,419 million), including approximately RMB1,463 million (2021: RMB1,368 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 2022, the contributions to the supplementary defined contribution retirement scheme paid by the Group amounted to approximately RMB827 million (2021: RMB828 million), including approximately RMB805 million (2021: RMB792 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% (2021: 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 2022 amounted to approximately RMB30.00 million (2021: RMB24.16 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 expenditures are allocated to the cost of assets or charged to profit or loss. The housing funds and social insurance contributions paid by the Group amounted to approximately RMB1,317 million (2021: RMB1,210 million) and RMB1,105 million (2021: RMB1,326 million) for the year ended 31 December 2022 including approximately RMB1,285 million (2021: 1,151 RMB million) and RMB1,070 million (2021: RMB1,283 million) charged to profit or loss, respectively.

Five highest paid individuals

The five individuals whose emoluments were the highest in the Group for the year included one director (2021: two directors). Directors' emoluments are reflected in the analysis presented in Note 38. The emoluments payable to the remaining four (2021: three) highest paid individuals during the year (within the range of nil to RMB1.170 million) are as follows:

	For the year ended 31 December	
	2022	2021
Basic salaries	**777**	626
Performance bonuses	**2,780**	2,243
Pension	**702**	487
	4,259	3,356

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 2022 is set out below:

	Fees	Basic salaries	Performance bonuses	Pension	Total
Name of director					
Mr. Zhao Keyu	–	244	666	187	1,097
Mr. Zhao Ping[1]	–	183	579	138	900
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	427	1,245	325	3,497
Name of supervisor					
Mr. Li Shuqing	–	–	–	–	–
Mr. Mu Xuan	–	–	–	–	–
Mr. Gu Jianguo	–	–	–	–	–
Mr. Xu Jianping	–	157	831	176	1,164
Mr. Zhu Tong[4]	–	157	831	175	1,163
Mr. Xia Aidong[5]	–	–	–	–	–
Sub-total	–	314	1,662	351	2,327
Total	1,500	741	2,907	676	5,824

(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)*

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	–	249	856	175	1,280
Mr. Zhao Ping[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

1 Resigned on 26 Sep 2022
2 Resigned on 22 June 2021
3 Resigned on 9 June 2021
4 Hired on 9 June 2021
5 Hired on 22 June 2021

38 DIRECTORS', SUPERVISORS' AND SENIOR MANAGEMENT'S EMOLUMENTS *(Cont'd)*

(a) Pre-tax benefits and social insurance of directors and supervisors *(Cont'd)*

During the year, no option was granted to the directors or the supervisors (2021: 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 (2021: nil).

No director or supervisor had waived or agreed to waive any emoluments during the years 2022 and 2021.

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	
	2022	2021
Contracted, but not provided	**52,168,613**	25,770,547

(b) Fuel purchase commitments

As at 31 December 2022, the Group has entered into major fuel purchase commitment amounting to approximately RMB8.445 billion (31 December 2021: RMB16.248 billion).

(Amounts expressed in thousands of RMB unless otherwise stated)

39 COMMITMENTS *(Cont'd)*

(b) Fuel purchase commitments *(Cont'd)*

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 2022	
	Periods	Purchase quantities	Estimated unit costs (RMB)
A government-related enterprise	2023-2039	2.8 million m^3/day*	3.45/m^3
A government-related enterprise	2023	30.22 million m^3/month*	2.97/m^3
	2023	4.89 million m^3/month*	2.89/m^3
	2023	32.67 million m^3/month*	2.86/m^3
A government-related enterprise	2023-2026	222 million m^3/year*	4.59/m^3
Other suppliers			
	2023	75.61-193.67 BBtu**/day	approximately 54,000/BBtu
	2024-2028	42.4-81.52 BBtu**/day	approximately 65,000/BBtu
	2029	42.4 BBtu**/day	approximately 61,000/BBtu

		As at 31 December 2021	
	Periods	Purchase quantities	Estimated unit costs (RMB)
A government-related enterprise	2022-2039	2.8 million m^3/day*	2.12/m^3
A government-related enterprise	2022-2023	518 million m^3/year*	2.67/m^3
	2022-2023	541 million m^3/year*	2.49/m^3
	2022-2023	459 million m^3/year*	2.65/m^3
A government-related enterprise	2022-2026	222 million m^3/year*	2.49/m^3
Other suppliers	2022	199.02-249.02 BBtu**/day	Approximately 66,000/Bbtu
	2023	233.11-239.77 BBtu**/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

* 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 2022											
Non-current assets	7,129,365	5,580,235	2,847,107	3,572,888	3,807,477	3,935,734	2,566,746	1,848,473	57,495,793		
Current assets	1,510,731	1,344,148	1,897,370	700,957	939,384	1,416,251	501,627	679,620	17,430,477		
Non-current liabilities	(2,763,697)	(129,475)	(396,445)	(380,854)	(1,331,999)	(1,238,777)	(363,151)	(938,762)	(28,529,524)		
Current liabilities	(3,540,649)	(1,173,904)	(1,787,173)	(2,751,708)	(2,012,426)	(2,740,484)	(1,607,475)	(1,022,554)	(39,179,729)		
Net assets	2,335,750	5,621,004	2,560,859	1,141,283	1,402,436	1,372,724	1,097,747	566,777	7,217,017		
Carrying amount of NCI	708,216	3,316,424	1,003,326	456,513	815,770	583,440	548,874	182,154	5,508,373	6,528,447	19,651,537
Revenue	5,659,101	5,704,581	4,884,709	4,124,057	4,240,271	4,710,790	2,866,310	2,195,690	37,518,626		
Net (loss)/profit	(563,957)	352,953	125,015	(744,127)	(318,467)	(449,419)	(329,250)	(959,927)	(3,762,458)		
Total comprehensive (loss)/ income	(563,957)	352,953	125,015	(744,127)	(318,467)	(449,419)	(329,250)	(959,927)	(4,437,026)		
(Loss)/profit allocated to NCI	(225,583)	208,242	50,006	(297,651)	(127,387)	(202,239)	(164,625)	(431,967)	(752,492)	(1,002,686)	(2,946,382)
Other comprehensive loss allocated to NCI	–	–	–	–	–	–	–	–	(134,914)	(220,638)	(355,552)
Cash flows from operating activities	590,479	697,891	491,366	71,811	225,973	(43,938)	180,748	(372,032)	4,394,426		
Cash flows from investing activities	(110,239)	(172,124)	(116,043)	(160,083)	(167,940)	(146,043)	(27,998)	(86,038)	(5,410,141)		
Cash flows from financing activities	(395,381)	(537,096)	(399,293)	107,229	(59,924)	95,023	(150,210)	497,212	1,417,114		
Net increase/(decrease) in cash and cash equivalents	84,859	(11,329)	(23,970)	18,957	(1,891)	(94,958)	2,540	39,142	401,399		
Dividends paid to NCI	–	325,012	71,320	–	–	–	–	63,335	12,000		

(Amounts expressed in thousands of RMB unless otherwise stated)

40 NON-CONTROLLING INTERESTS *(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 2021 (restated)											
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	7,323,447	20,509,045
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)	(950,001)	(2,555,900)
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		

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 2022	228,881	5,153,793	263,517	12,992,702	965,034	19,603,927
Additions	120,199	911,789	29,208	1,068,705	54,288	2,184,189
Depreciation charge	(109,551)	(291,909)	(17,798)	(515,710)	(58,430)	(993,398)
Disposals/write-off	–	(2,411)	–	(105,055)	(45,954)	(153,420)
Early termination	(742)	(1,707,074)	–	–	–	(1,707,816)
Currency translation differences	24	419	(18,312)	77,553	5,667	65,351
As at 31 December 2022	238,811	4,064,607	256,615	13,518,195	920,605	18,998,833
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

* Land use rights without ownership certificates

As at 31 December 2022, the Group was in the process of applying for the ownership certificates for certain land use rights with an aggregate net book value of RMB113.67 million (2021: RMB71.63 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 2022, no land use right was seized due to pre-litigation preservation (31 December 2021: with net book value of RMB17 million).

(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:

	2022	2021
Carrying amount at 1 January	6,939,367	5,482,346
New leases	1,689,566	3,193,836
Accretion of interest recognised during the year	313,439	374,244
Currency translation differences	17,369	(58,294)
Payments	(947,783)	(1,860,532)
Early termination	(1,380,083)	(192,233)
Carrying amount at 31 December	6,631,875	6,939,367
Analysed into:		
Current portion	1,009,339	800,521
Non-current portion	5,622,536	6,138,846

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	
	2022	2021
Within 1 year	1,234,265	1,026,900
After 1 year but within 2 years	549,082	1,624,435
After 2 years but within 3 years	522,842	602,623
After 3 years	6,427,096	5,656,876
Subtotal	8,733,285	8,910,834
Unrecognised finance fees	2,101,410	1,971,467
Total	6,631,875	6,939,367

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	
	2022	2021
Interest on lease liabilities	313,439	374,244
Depreciation charge of right-of-use assets	985,746	749,383
Expense relating to short-term leases	325,667	111,886
Expense relating to leases of low-value assets	1,336	3,023
Total amount recognised in profit or loss	1,626,188	1,238,536

(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 2022, 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.

The Group as a lessor

(a) Finance lease

The Group's finance lease is mainly related to Ruyi Pakistan Energy, SinoSing Power and Shandong Energy Engineering.

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 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.

For the year ended 31 December 2022 and 2021, Shandong Energy Engineering 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. As of 31 December 2022, the above mentioned finance lease was terminated due to the acquisition of Huangtai #8 Power Plant.

(Amounts expressed in thousands of RMB unless otherwise stated)

41 LEASES *(Cont'd)*

The Group as a lessor *(Cont'd)*

(a) Finance lease *(Cont'd)*

Total finance lease income recognised by the Group for the year ended 31 December 2022 was RMB1,236 million (2021: RMB1,325 million).

As at 31 December 2022, the maturity analysis of the Group's finance lease receivables is as follows:

	As at 31 December	
	2022	2021
Within 1 year	**2,206,566**	1,872,397
After 1 year but within 2 years	**2,183,144**	1,883,028
After 2 years but within 3 years	**2,151,126**	1,893,937
After 3 years but within 4 years	**2,120,666**	1,900,892
After 4 years but within 5 years	**1,901,463**	1,922,609
After 5 years	**15,519,074**	15,585,762
Total undiscounted finance lease payments	**26,082,039**	25,058,625
Unearned finance income	**(16,633,898)**	(15,840,838)
Allowance for ECL	**(4,383)**	(2,643)
Total finance lease receivables as at 31 December (Notes 15 and 17)	**9,443,758**	9,215,144

(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 2022 was RMB93 million (2021: RMB148 million).

As at 31 December 2021 and 2022, 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	
	2022	2021
Within 1 year	**52,403**	108,066
After 1 year but within 2 years	**2,098**	2,378
After 2 years but within 3 years	**650**	781
After 3 years but within 4 years	**446**	546
After 4 years but within 5 years	**193**	193
After 5 years	**398**	398
Total	**56,188**	112,362

42 STATEMENT OF FINANCIAL POSITION OF THE COMPANY

	As at 31 December	
	2022	2021 (Restated)
ASSETS		
Non-current assets		
Property, plant and equipment	23,924,577	24,002,829
Right-of-use assets	1,062,811	1,169,101
Investments in associates and joint ventures	13,375,678	13,897,154
Investments in subsidiaries	138,158,396	124,925,251
Loans to subsidiaries	12,826,417	16,204,513
Investment property	141,030	146,456
Other equity investment	574,060	587,354
Deferred income tax assets	648,659	841,225
Goodwill	106,854	106,854
Other non-current assets	12,250,200	4,405,579
Total non-current assets	203,068,682	186,286,316
Current assets		
Inventories	1,223,193	2,451,370
Other receivables and assets	6,377,041	6,329,988
Accounts receivable	3,762,544	4,136,359
Loans to subsidiaries	1,139,624	1,978,006
Bank balances and cash	1,008,281	1,693,600
Total current assets	13,510,683	16,589,323
Total assets	216,579,365	202,875,639
EQUITY AND LIABILITIES		
Equity		
Share capital	15,698,093	15,698,093
Capital surplus	25,679,749	25,756,289
Other equity instruments	62,083,704	48,417,977
Surplus reserves	8,140,030	8,140,030
Reserve funds	54,381	–
Retained earnings	22,437,629	23,380,123
Total equity	134,093,586	121,392,512

(Amounts expressed in thousands of RMB unless otherwise stated)

42 STATEMENT OF FINANCIAL POSITION OF THE COMPANY *(Cont'd)*

	As at 31 December	
	2022	2021 (Restated)
EQUITY AND LIABILITIES (Cont'd)		
Non-current liabilities		
Long-term loans	**16,521,856**	4,633,270
Long-term bonds	**34,104,730**	25,295,617
Lease liabilities	**55,898**	101,928
Other non-current liabilities	**922,271**	1,364,445
Total non-current liabilities	**51,604,755**	31,395,260
Current liabilities		
Accounts payable and other liabilities	**5,015,453**	5,594,662
Contract liabilities	**413,191**	400,474
Taxes payable	**177,979**	158,868
Short-term bonds	**6,011,222**	8,022,474
Short-term loans	**18,293,678**	26,614,872
Current portion of long-term loans	**241,611**	2,053,276
Current portion of long-term bonds	**682,313**	7,140,727
Current portion of lease liabilities	**45,577**	102,514
Total current liabilities	**30,881,024**	50,087,867
Total liabilities	**82,485,779**	81,483,127
Total equity and liabilities	**216,579,365**	202,875,639

43 SUBSEQUENT EVENTS

Up to the annual report date, there was no material subsequent event.

44 CONTINGENT LIABILITIES

Disputes over responsibilities for damage caused by vessel collision over the 400MW Offshore Wind Power Project of Shengdong Rudong Offshore Windpower Co., Ltd. ("Shengdong Rudong").

Shengdong Rudong, a subsidiary of the Company, was in charge of the construction and operation of a 400MW Offshore Wind-power Project. As stipulated by the construction contract signed between Shengdong Rudong and CCCC Third Harbor Engineering Bureau Co., Ltd. ("CCCC Third Harbor Bureau") on 18 April 2019, CCCC Third Harbor Bureau was responsible for the construction of the offshore wind farm and related construction safety management. On 1 August 2019, a vessel chartering contract was signed between CCCC Third Harbor Bureau and Nantong Ocean Water Construction Engineering Co., Ltd. ("Nantong Water Construction"). As stipulated by the contract, Vessel "Wen Qiang 8", which was owned by Nantong Water Construction, would be chartered by CCCC Third Harbor Bureau as the construction operation vessel. During the chartering period, Nantong Water Construction was responsible for the safety of Vessel "Wen Qiang 8" and the security of the personnel on board.

On 22 September 2019, in order to evade typhoon, Vessel "Wen Qiang 8" anchored nearby the #32 wind turbine pile foundation of Shengdong Rudong 400MW Offshore Wind-farm located around Nantong coastal area. Affected by strong wind, violent waves and big tides, the anchor steel cable was broken, leading to dragging-of-anchor of Vessel "Wen Qiang 8", and collision with the pipeline bridge of land-island access of Nantong Gang Yangkou Port. The pipeline bridge, bearing line pipes, and Vessel "WenQiang 8" all suffered damages from this collision accident, constituting a relatively large level of water traffic accident.

The above accident has resulted in three lawsuits in 2020, with the litigation claiming amount being approximately RMB831 million in total. Shengdong Rudong, together with other several entities, were joint defendants. At the end of 2021, the lawsuits were accepted by the court and are pending for judge up to now. Since the lawsuits are still at the stage of evidences exchange and loss identification between the plaintiff and the joint defendants, it is not possible to estimate the financial impact on the Company's financial statements.

RECONCILIATION OF FINANCIAL STATEMENTS BETWEEN PRC GAAP AND IFRSs

FOR THE YEAR ENDED 31 DECEMBER 2022
(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/(loss) attributable to equity holders of the Company For the year ended 31 December		Total equity attributable to equity holders of the Company As at 31 December	
	2022	2021 (Restated)	2022	2021 (Restated)
Consolidated net loss/equity attributable to equity holders of the Company under PRC GAAP	(7,387,119)	(10,006,110)	108,535,478	105,534,930
Impact of IFRSs 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)	(1,097,405)	(777,213)	5,981,974	7,079,379
Difference on depreciation related to borrowing costs capitalised in previous years (b)	(22,074)	(25,597)	53,751	75,825
Others	8,203	(40,695)	(392,700)	(394,630)
Applicable deferred income tax impact on the GAAP differences above (c)	223,548	326,042	3,128,983	2,905,435
Profit/equity attributable to non-controlling interests on the adjustments above	248,614	145,634	(1,642,964)	(1,873,784)
Consolidated net loss/equity attributable to equity holders of the Company under IFRSs	(8,026,233)	(10,377,939)	115,664,522	113,327,155

(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.

(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.