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2019 SUSTAINABILITY REPORT



CHINA HUANENG GROUP CO., LTD.

# 2019 Sustainability Report

## Committed to National Rejuvenation, and Shouldering Responsibility



The logo of China Huaneng Group consists of the deformation of letters "H" and "N".

"H" and "N" are the first letters of Chinese phonetic transcription of "Huaneng", and the meaning of the combination is: contributing energy and adding power for national rejuvenation while creating happiness.

Letter "H" adopts a bold font, which is powerful and vigorous, presenting a visual image of safety, reliability and steadiness; letter "N" connects letter "H" with three rays to form a lightning font, symbolizing perpetual and unlimited power; and dark blue is chosen as the base color, demonstrating solemnness, rigor, serenity and harmony, as well as broad-mindedness and lofty ambition.

The shape of the letters resembles mountain peaks, emitting a grand atmosphere; the composition of the logo is neat and orderly, giving a sense of solemnness; and the superposition effect is concise and lively, full of vitality, exhibiting the sacred mission and demeanor of Huaneng as a key state-owned backbone enterprise.



## About This Report

### Reporting Period

January 1, 2019 to December 31, 2019. Some of the contents go beyond the above range.

### Reporting Cycle

Our report is an annual report. This edition is the 14th sustainability report released by the company since 2006.

### Main Contents

This report outlines our intentions, actions and performance in 2019 on economic, environmental and social issues. Its relevant content, data and cases are rooted from relevant company documents, statements and grassroots enterprises.

### Compilation Basis

Guidelines on Social Responsibility (GB/T36000-2015)  
Guidelines on Corporate Social Responsibility Reporting for Chinese Enterprises (CASS-CSR 4.0)  
Guidelines on Social Responsibility of Chinese Industrial Enterprises and Industrial Associations  
Unified Standard for the Sustainability Reporting from the Global Reporting Initiative (GRI)  
ISO 26000: Guidance on Social Responsibility (2010)

### Title Description

For convenience purpose of expression, in this report, "CHNG", "Huaneng Group", "Huaneng", "the Company" and "We" refer to "China Huaneng Group Co., Ltd."

### Online Access to the Report

The report is available in Chinese, English and a video version. The Chinese version and the video version are released at the same time. Please visit our website: <http://www.chng.com.cn> or call the following number: 010-63228777  
E-mail: [hnshzr@chng.com.cn](mailto:hnshzr@chng.com.cn)  
Address: No. 6, Fuxingmennei Street, Xicheng District, Beijing  
Postal Code: 100031

Scan QR code to access the video version report



# Great Achievements as Homage to the 70th Anniversary of the Founding of the People's Republic of China

Evolving from the earliest electric power technology research institute, the first "first-class thermal power plant" in China to the developer of the first "domestic 1,000 MW ultra supercritical coal-fired unit", CHNG, as a central SOE, has always been running in the forefront of China's power industry. Amid the development of China, CHNG has made unremitting efforts to step on the world stage, representing by utilizing foreign capital for power generation, going public in "three places" and being listed in Fortune Global 500.

Xi'an Thermal Power Research Institute, the earliest electric power technology research institute in China



Xi'an Thermal Power Research Institute solves challenges for power generation enterprises with its strong strength and exquisite technology, and makes contributions to the technical progress of China's power industry.

Yuhuan Power Plant, the birthplace of the first domestic 1,000 MW ultra supercritical coal-fired unit



In November 2006, Unit 1 of Yuhuan Power Plant, the first domestic 1,000 MW ultra supercritical coal-fired unit, was officially put into commercial operation, marking that the manufacturing capacity and technical level of China's power generation equipment have stepped to a new level.

Huaneng Power International, the first Chinese power enterprise listed on three stock exchanges



In December 2001, A-shares of Huaneng Power International were listed on the Shanghai Stock Exchange, achieving its goal to be listed in New York, Hong Kong and Shanghai stock exchanges.

Rudong Offshore Wind Farm, the first 300 MW offshore wind farm in China



In September 2017, Huaneng Rudong Offshore Wind Farm Project was completely connected to the grid, breaking the record of the largest unit capacity of large-scale offshore wind turbines in China.

Biedieli Hydropower Station, the biggest poverty alleviation project in Xinjiang



To provide assistance to Xinjiang through industrial investment, we invested RMB 2.14 billion yuan to build Biedieli Hydropower Station with an annual power generation of 870 million kWh and an average annual tax payment of more than RMB 40 million yuan, accounting for 40%-50% of the financial revenue of Aheqi County.

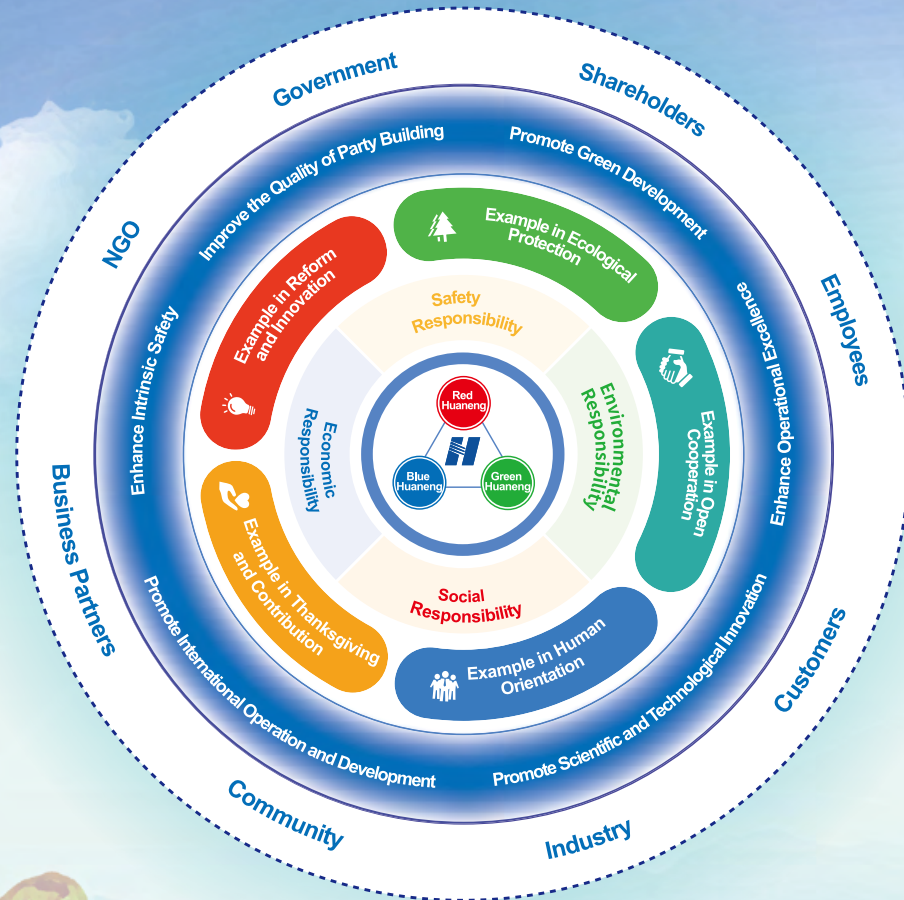
Dalian Power Plant, the earliest first-class power plant in China



Dalian Power Plant proactively launched the implementation and certification of international standards, and took the lead in establishing and improving the QHSE integrated management system among domestic power enterprises to further improve the management level.



# CHNG in Sustainable Development



## Responsibility as the Driving Force

**Persist in serving national interests and development strategies**  
An example in promoting economic and social development in all respects

**Persist in scientific development and technological innovation**  
An example in building a resources-conserving and environmentally friendly society

**Persist in pursuing enterprise value in a rational way**  
An example in promoting harmonious progress of both the enterprise and the society

**Persist in the principle of relying on employees and working with the public to develop the enterprise**  
An example in putting people first and sharing benefits

**Persist in paying back to society and benefiting the people**  
An example in practicing social ethics

## Overall Planning

### North Line Planning

North line (the "north China, northwest China and northeast China" area): rely on the starting point of UHV transmission passage way, focus on the layout of large-scale clean energy base integrating wind, PV, coal and power transmission and utilization

### East Line Planning

East line (the eastern coastal provinces): focus on building a high-quality and efficient offshore wind power development belt with large-scale bases, integrating investment, construction, operation and maintenance

## Corporate Mission

- A "red" company that serves national strategy, safeguards energy security, and serves the need of socialism with Chinese characteristics
- A "green" company that facilitates energy revolution, protects the environment, and supplies clean energy to ensure a better life for the people
- A "blue" company that participates in global energy governance, serves the Belt and Road Initiative, and contributes to building a community with a shared future for mankind

## Strategic Orientation

Power as the core business, synergy among various energy sectors, innovation as the leading force, finance as the supporting business, global layout

## Strategic Objective

- Speed up the building of a world-class energy company featuring "three colors, three strong and three excellents"
- Three colors: always adhere to the "three-color company" corporate mission
- Three strong: strong innovation capability, strong value creation capability and strong global competitiveness
- Three excellents: excellent assets, excellent management, excellent performance

## Strategic Upgrading



## Board of Directors



Shu Yinbiao

Secretary of the Party Leading Group and Chairman of the Board of Directors



Deng Jianling

Board Director, President, and Deputy Secretary of the Party Leading Group



Wang Sen

Board Director and Deputy Secretary of the Party Leading Group



Zhang Fusheng

External Board Director



Zhu Yuanchao

External Board Director



Zou Zhengping

External Board Director



Xu Qiyang

External Board Director

## Management Team



Shu Yinbiao

Secretary of the Party Leading Group and Chairman of the Board of Directors



Deng Jianling

Board Director, President, and Deputy Secretary of the Party Leading Group



Wang Sen

Board Director and Deputy Secretary of the Party Leading Group



Fan Qixiang

Member of the Party Leading Group and Vice President



Wang Min

Member of the Party Leading Group and Vice President



Wang Yihua

Member of the Party Leading Group and Chief Financial Officer



Wang Wenzong

Member of the Party Leading Group and Vice President



Wang Limin

Member of the Party Leading Group and Chief Compliance Officer



Li Fumin

Member of the Party Leading Group and Vice President



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## Message from Chairman



Shu Ynbiao, Secretary of the Party Leading Group and Chairman of the Board of Directors

The year of 2019 marked the 70th anniversary of the founding of the New China, the crucial year for securing a decisive victory in building a moderately prosperous society in all respects and the year when the whole company made innovative breakthroughs on the basis of solidarity and painstaking efforts. As a key state-owned enterprise, CHNG, always keeping in mind the general strategy for the great rejuvenation of the Chinese nation and adhering to the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, earnestly applies the new development concepts, regards the deepening of the supply-side structural reform as our main task and strictly implements the new strategy of energy security featuring “four revolutions and one cooperation” to achieve better quality, higher efficiency and more robust driver, and speed up the building of a world-class energy company featuring “three colors, three strong and three excellents”.

In the past year, facing the complicated situation of the markets at home and abroad, CHNG resolutely followed the decisions made by the CPC Central Committee and the State Council, worked hard in a down-to-earth way, rose to the challenges and, as a result, made great progresses in “six new upgrades” and “two major breakthroughs”, completing various objectives and tasks. CHNG kept enhancing the Party Building work. By taking the earnest study and implementation of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era as the primary political task, CHNG substantially launched the campaign on the theme of “Remain True to the Party’s Original Aspiration and Keep the Party’s Mission Firmly in Mind”, which achieved a significant result. **As a Role Model among Chinese Companies, CHNG Carries out Practical Actions to Help China Thrive.** CHNG optimized its industrial layout. Centering on the electric power industry, CHNG strived for synergy among sectors of coal, transportation, technology and finance, all of which gained profits. CHNG comprehensively upgraded the quality of development by continuously deepening the internal reform, leading to the increase of management efficiency by a big margin. The operating revenue reached RMB306.11 billion, up 9.89% year-on-year, and the profit reached RMB17.85 billion, up 24.28% year-on-year. CHNG built partnership platforms, actively facilitated international development, set up 6 overseas representative offices, co-organized the 83rd IEC General Meeting, and made the first breakthrough in terms of international standards. CHNG participated in creating a happy well-off life. In the whole year, CHNG invested capital estimated at RMB714 million to promote the poverty alleviation efforts in 142 poverty-stricken villages across the country, completing the task of targeted poverty alleviation in Hengshan District of Yulin in Shaanxi and Aheqi County of the Kizilsu Kirghiz Autonomous Prefecture in Xinjiang. CHNG has been rated as the most outstanding by the State Council Leading Group Office of Poverty Alleviation and Development in the evaluation of targeted poverty alleviation for three years on end. **As an Energy Pioneer, CHNG Serves the Country by Securing Power Supply.** CHNG ensured stable power supply and managed to ensure production and power supply in the key period when important events in the country took place or in the period when severe weather of bitter cold or torrid heat. In the whole year, CHNG’s annual domestic generation reached 705.7 billion kWh, up 0.44% year-on-year. By deepening scientific and technological innovation, CHNG preliminarily made the overall arrangement concerning scientific and technological innovation. In the whole year, CHNG won 21 scientific and technological awards at provincial or ministerial level, 777 granted patents and 2 China Excellent Patent Awards, creating a new high in history. CHNG strictly implemented the human-oriented safety concept by deepening the implementation of the responsibility system for all staff. As a result, there was no occurrence of major accidents throughout the year, indicating the continuous improvement of intrinsic safety level. CHNG paid attention to enhancing ecological protection by accelerating the strategic layout featuring “two-line” (north line and east line) and “two-integration” (integration of wind, photovoltaic, coal, electricity transmission and consumption, and integration of offshore wind power investment, construction, operation and maintenance). At present, the installed capacity of low-carbon and clean energy had surpassed 61 GW. Moreover, new breakthroughs were made in terms of structural adjustment with the emissions reduction performance of major pollutants ranking the first in the industry.

What’s past is prologue. The year of 2020 is the concluding year of building a moderately prosperous society in all respects and the 13th Five-Year Plan period, and also the critical year for CHNG to develop into a world-class energy company. Adhering to the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and comprehensively following the spirit of the 19th CPC National Congress, CHNG will, by taking production safety as the basis, eco-environment protection as the red line, efficiency and effectiveness as the center, reform and innovation as the driving force and the Party Building as the guarantee, deepen the implementation of the strategic tasks of “six new upgrades” and “two major breakthroughs” so as to ensure the completion of objectives and tasks, promote the high-quality development and accelerate the pace of building a world-class energy company featuring “three colors, three strong and three excellents”.

The way ahead may be long and arduous, which requires unremitting and painstaking efforts. Let’s rally more closely around the CPC Central Committee with Comrade Xi Jinping at its core, seize every moment, tackle the challenges head-on and resolutely shoulder the responsibility and mission given to CHNG in the new era so as to bravely usher in a new level of high-quality development and make new and greater contribution to the building of a moderately prosperous society in all respects and the realization of the “Two Centenary Goals”.



# CHNG Devoted to National Rejuvenation Make Steady Headway in Implementing the Theme Campaign



## Interpretation of Hot Words about the 70th Anniversary · Remain True to the Party's Original Aspiration

In July 2019, Xi Jinping published a signed article in Qiushi Journal, titled "Remain True to the Party's Original Aspiration and Deepen the Self-reform". The article noted: "When the Party requires all comrades of the Party shall remain true to our original aspiration and keep our mission firmly in mind, it means to remind all comrades of the Party that the original aspiration and mission are the nature and purpose of the Party, embodying the ideals, convictions and objectives. The true qualities of a Marxist party, original aspiration and self-reform spirit of the Party are necessary to ensure the CPC's long-term governance."

The Party Leading Group of CHNG firmly acted on the decisions and arrangements of the CPC Central Committee, fully implemented the general requirements of "keeping the original aspiration, undertaking the mission, finding the gaps, strengthening execution", and completed all tasks related to the campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind" with high quality. At CHNG, a total of 3,043 Party organizations and nearly 60,000 Party members participated in the campaign.

The campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind" was executed on the basis of practice	
Focus on the main line Lay a solid ideological foundation	<ul style="list-style-type: none"> <li>Be armed with theories</li> <li>Deeply study and implement the spirit of the Fourth Plenary Session of the 19th CPC Central Committee</li> <li>Promote the study, investigation and self-examination and improvement in an integrated manner</li> </ul>
Carry out self-analysis Check and face up to problems profoundly	<ul style="list-style-type: none"> <li>Go deep into the grassroots to carry out research</li> <li>Solicit opinions and suggestions from all sides</li> <li>Comprehensively check, face up to and list problems</li> </ul>
Do it for real Deepen the implementation and rectification	<ul style="list-style-type: none"> <li>Make improvement with force and tenacity in the spirit of hammering nails</li> <li>Start an initiative of follow-up rectification</li> <li>Further solve outstanding problems</li> </ul>
Make overall planning Make vigorous and orderly progress	<ul style="list-style-type: none"> <li>Strengthen organizational leadership</li> <li>Move forward in a coordinated manner</li> <li>Strengthen strict supervision and practical guidance</li> </ul>

The campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind" has yielded outstanding results
<ul style="list-style-type: none"> <li>The political stance, political consciousness and political competencies of Party members and cadres have been significantly improved</li> </ul>
<ul style="list-style-type: none"> <li>Implement the spirit of the important instructions given by General Secretary Xi Jinping and the CPC Central Committee's decision and deployment more conscientiously</li> </ul>
<ul style="list-style-type: none"> <li>Resolutely preserve the sense of mission in the process of undertakings, and gather strength in unity to seek development</li> </ul>
<ul style="list-style-type: none"> <li>Take more efficient measures to overcome difficulties and promote high-quality development</li> </ul>
<ul style="list-style-type: none"> <li>Tapping the potential has greatly improved CHNG's operating performance</li> </ul>

## Milestones of the campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind"

- June 14, 2019**  
 The Party Leading Group of CHNG carried out the first centralized study and discussion on the theme campaign in 12 special topics.
- June 06, 2019**  
 CHNG held the mobilization meeting of campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind" for the purpose of mobilization and deployment regarding the campaign in CHNG.
- July 23, 2019**  
 The Party Leading Group of CHNG held a special Party lecture on the theme campaign, which was given by Shu Yinbiao, Secretary of the Party Leading Group and Chairman of the Board of Directors.
- July 13, 2019**  
 The management team of CHNG went to Li Dazhao's former residence to receive revolutionary traditional education, trace the footprints of revolutionary predecessors, and carry out the theme campaign in a deep-going way.
- July 31, 2019**  
 Xiao Zonghui, Deputy head of the 30th Central Steering Group of the Theme Campaign, went to Huaneng Beijing Cogeneration Power Plant to survey and guide on the campaign.
- August 15, 2019**  
 CHNG held a seminar on the advanced deeds of academician Ma Hongqi, calling on all Party members to learn from him in terms of his political character, excellent style of work and noble sentiment.
- August 29, 2019**  
 The management team of CHNG held a meeting about the campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind".
- September 10, 2019**  
 CHNG held a meeting for summarizing the first batch of theme campaign activities and mobilizing the second batch of theme campaign activities.
- October 30, 2019**  
 Lu Chun, head of the 12th Central Patrol Supervision Team of the Theme Campaign, went to the headquarters of CHNG to give feedback on the supervision.
- December 17, 2019**  
 CHNG held a guidance lecture on studying the spirit of the Fourth Plenary Session of the 19th CPC Central Committee, and Shu Yinbiao, Secretary of the Party Leading Group and Chairman of the Board of Directors, gave a lecture for the company and its affiliates.
- January 09, 2020**  
 CHNG held a summary meeting on the campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind".



Scan the QR code and watch the report of CCTV's "Xinwen Lianbo", or News Broadcast on CHNG's campaign themed "Remain True to the Party's Original Aspiration and Keep the Party's Mission Firmly in Mind"

"The Party Leading Group of China Huaneng has thoroughly studied and implemented Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, conscientiously implemented the CPC Central Committee's deployments, and promoted the theme campaign in a solid way, accumulating a wealth of good practices, such as adherence to coordinated supervision and guidance for "three full coverages"; adherence to strict and practical standards, implementing "22-check" specific working method, and strengthening process control. These measures are highly targeted, characteristic, and effective, and have achieved fruitful results."

— Lu Chun, head of the 12th Central Patrol Supervision Team of the Theme Campaign



# CHNG Serves the Country Resolutely Provide Assistance to Targeted Poverty-stricken Areas



## Interpretation of Hot Words about the 70th Anniversary • Poverty Alleviation

On April 16, 2019, President Xi said at a Symposium on Resolving Prominent Problems in Poverty Alleviation: "Winning the fight against poverty is a historic mission that is both glorious and immensely challenging. If we are to attain complete success in this mission, we must continue putting in arduous efforts. We must press on with courage and resolve, making new and greater contributions so that we may realize our goals of winning the fight against poverty and building a moderately prosperous society on schedule."

As a central SOE, CHNG firmly implements the work deployment of the CPC Central Committee and the State Council on targeted poverty alleviation for which the central units take responsibility, and help to lift Hengshan District of Yulin City in Shaanxi Province and Aheqi County of Xinjiang Uygur Autonomous Region out of poverty. With the joint efforts of CHNG and the local Party committees and governments, Hengshan District and Aheqi County have been lifted out of poverty respectively in September 2018 and April 2019. In 2019, six key indicators of the targeted poverty alleviation that CHNG was responsible for were respectively 1.08, 1.27, 1.62, 1.58, 3.27 and 6.08 times of the required values in the Responsibility Agreement of Central Units on Targeted Poverty Alleviation (2019).



## Strengthen the Management of Targeted Poverty Alleviation

### Strengthen organizational leadership

The company set up a poverty alleviation and assistance leading group, with the responsibilities of 12 member departments well defined; held a meeting for promoting CHNG's poverty alleviation work and for comprehensive deployment, with a total of 222 persons from the leading group's member departments and 47 subsidiaries attending the meeting.

### Dispatch Cadres on Secondment

In the whole year, Huaneng dispatched 10 outstanding cadres to serve as temporary first secretary in targeted areas, including 5 cadres to Hengshan District, Yulin City of Shaanxi Province, and 5 cadres to Aheqi County, Kizilsu Kirgiz Autonomous Prefecture, Xinjiang Autonomous Region.

### Strengthen Supervision and Guidance

The company leaders visited Hengshan District and Aheqi County for five times to check the projects and give face-to-face feedback to leaders of the local governments and relevant departments concerning the approval, audit and acceptance of poverty alleviation projects.



Shu Yinbiao, Secretary of the Party Leading Group and Chairman of the Board of Directors, visited Hengshan to check the industrial assistance projects and the works in villages.

### Train Cadres

The company provided RMB 3.6 million as poverty alleviation funds, and trained cadres for a total of 2,560 person-times. The targeted poverty alleviation training was provided to a total of 108 people, including poverty alleviation managers, cadres on secondment, first Party secretaries and village team leaders.

### Increase Capital Input

The company provided RMB 37.81 million yuan of poverty alleviation funds free of charge, an increase of RMB 18.91 million yuan over the previous year, at a growth rate of more than 100%, and introduced public welfare projects of China Ocean Development Foundation valued at RMB 1.27 million yuan.

### Promote Poverty Alleviation through Consumption

The company held agricultural product production and marketing activities for poverty-stricken areas under fixed-point poverty alleviation, helped them sell their agricultural products on Chengzhangbao APP, an e-commerce platform of CHNG, and organized them to attend the China Charity Fair and Sinopec Poverty Alleviation Trade Fair, expanding the brand influence and sales coverage of local high-quality characteristic agricultural products.

## Innovate the Practice of Fixed-point Poverty Alleviation

### Aheqi: address the problem of characteristic industry development

Since 2010, CHNG has vigorously supported the development of seabuckthorn industry in Aheqi County, and nearly 70,000 mu of seabuckthorn have been planted, effectively broadening the channels for farmers and herdsmen to increase their income. In 2018, CHNG successfully introduced Zhongke Seabuckthorn Technology Co., Ltd. with a registered capital of RMB 12 million yuan to invest RMB 50 million yuan to construct a seabuckthorn deep-processing project. With an annual production capacity of 5,000 tons, an estimated annual sales revenue of RMB 200 million yuan, and the profit and tax of RMB 30 million yuan, the project is the largest private investment project in Aheqi County so far. A technology called "fluidized quick-freezing tunnel branch-fruit separation" is used to improve the picking efficiency by 5-8 times, greatly reducing the picking intensity, and fundamentally addressing challenges, such as picking, quality assurance, marketing, that restrict the development of the seabuckthorn segment.

In 2019, CHNG set up the Seabuckthorn Industry Development Fund in Aheqi County, contributed more than RMB 14 million yuan to build standardized workshops and supporting facilities, while Zhongke Seabuckthorn Technology Co., Ltd. invested RMB 23.05 million yuan to purchase and install production and processing equipment, to create a comprehensive industrial park integrating preservation, production, processing, technology research and development. The park recruited 41 employees, including 38 Kirgiz employees and 16 registered poverty-stricken households. What's more, the park set a record for the highest fruit yield in Aheqi County, and the labor income of farmers and herdsmen was doubled compared with previous years.



Seabuckthorn Industry in Aheqi County

### Hengshan District: promote the transformation and upgrading of leading industries

Combined with the basic advantages of goat industry development in Hengshan District of Yulin City, CHNG explored the path of poverty alleviation through industrial investment and the mode of collaborative development featuring "brand building + product traceability + rural e-commerce + leading enterprises + professional cooperatives + mutual funds + registered poverty-stricken households". CHNG set up industrial mutual funds in poverty-stricken villages to provide working capital loans for poverty-stricken households with self-development ability and help poverty-stricken households without labor capacity to take shares in farming cooperatives. CHNG registered "Northern Shaanxi Hengshan" series of public brand trademarks, developed an agricultural product traceability supervision platform, and coordinated processing enterprises to purchase products of poverty-stricken village cooperatives at prices above market prices. The company also set up an Industrial Poverty Alleviation Fund to help local leading enterprises comprehensively upgrade their management mode and production capacity by purchasing their shares, thereby promoting the rapid development of leading industries.

The pilot project of mutual funds can increase the income of poverty-stricken households by RMB 1,000 yuan every year, and the leading enterprises getting support purchased and sold goats from 630 poverty-stricken households in 26 poverty-stricken villages at a price 10% higher than the market purchase price. The online inquiry of all production information about feeding and processing is available for "Northern Shaanxi Hengshan Mutton". Compared with the previous year, the price of mutton in the local farmers' market was increased by RMB 10 yuan per kilogram, the packed products was nearly RMB 160 yuan per kilogram, and the output value of mutton sold by this region was increased by RMB 150 million yuan in that year.



"Goat" Industry in Hengshan District



## CHNG Responsibility

### Make Great Efforts to Build Green Offshore Wind Farms



#### Interpretation of Hot Words about the 70th Anniversary • Beautiful China

On April 28, 2019, Xi Jinping said at the opening ceremony of the International Horticultural Exhibition 2019 Beijing: “Ecological conservation has become part of China’s overall plan for national development. Building a beautiful China is an inspiring goal for the Chinese people. As China has been speeding up ecological conservation, people will live in a better environment with blue sky, green mountains and clear water.”

On September 29, 2019, Huaneng Dafeng 300 MW offshore wind farm (Phase I), the farthest offshore wind farm in China, was officially put into operation. This is a solid step in the process of building a 10,000 MW offshore wind power base in the eastern coastal provinces, and it is also a special gift for the 70th anniversary of the founding of the New China.

Dafeng Offshore Wind Power Project, with a planned installed capacity of 400 MW, is located in Maozhusha sea area of Dafeng, Yancheng, Jiangsu Province. As the farthest offshore wind farm in China, the offshore booster station of the farm has an offshore distance of about 55 km. The project is constructed in two phases. The first phase has an installed capacity of 300 MW, with a total of 68 wind turbines, including 48 sets of Envision Energy 4.2 MW units and 20 sets of CSSC 5 MW units; the second phase will install 23 sets of Envision Energy units with a unit capacity of 4.2 MW. The first phase of the project was started on December 20, 2018, and grid-connected on September 29, 2019. It is estimated that the annual on-grid electricity will be 860 million kWh, equivalent to 265,000 tons of standard coal being saved every year, that is, 583,000 tons of carbon dioxide emissions, 106,000 tons of ash and 516,000 tons of smoke and dust will be reduced every year. In addition, 2.54 million cubic meters of water can be saved every year, and the waste water discharge can be reduced accordingly, providing significant environmental benefits.

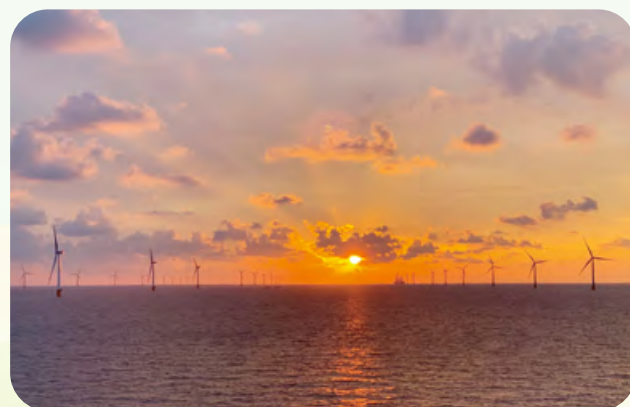
#### Milestones of Dafeng Offshore Wind Farm (Phase I)

##### 2018

- On February 18, the construction and installation works of onshore switchyard started
- On July 28, the main works of the onshore switchyard were completed
- On December 25, the main offshore works began

##### 2019

- On January 13, the first wind turbine was successfully installed
- On March 29, the offshore booster station backfeeding was completed
- On April 2, the first wind turbine started power generation upon grid connection
- On August 22, the pile sinking of the main offshore works was fully completed
- On August 31, the laying of the first circuit of submarine cable was completed
- On September 29, Dafeng Offshore Wind Power Project (Phase I) was officially put into operation



Dafeng Offshore Wind Farm (Phase I)

#### Huaneng Spirit • Tackle Difficulties

Dafeng sea area has a large seabed drop, and some of the seabed contains soft interlayer. Any carelessness will cause “pile sliding”, which will cause great risk and difficulty to the project construction. To this end, CHNG conducted detailed investigation and deep research, and developed special solutions and early warning mechanisms for special sea areas and key areas to effectively prevent risks.

As the farthest offshore wind farm project in China, the project faced unprecedented challenges, i.e. the laying of main submarine cables with an ultra length of 55 km. To address this problem, CHNG gathered the wisdom of all parties, conducted in-depth research, and finalized the scheme of “segmented manufacturing, segmented laying and intermediate jointing”.

In order to complete the laying of main submarine cables in the shallow water area during the tidal surge, CHNG and the construction company organized the designer and supervisor to analyze and test the geological and navigation conditions of the landing section of submarine cables during the manufacturing period of submarine cables, and the laying of submarine cables were completed ahead of schedule.

To speed up the project progress and ensure the project quality, CHNG took the lead in employing offshore wind power technicians through bidding, and five electrical engineers from the New Energy Technology Department of Xi’an Thermal Power Research Institute were employed to ensure the smooth, orderly, safe and reliable construction of the project.

#### Huaneng Wisdom • A Single Spark Can Start a Prairie Fire

In 2019, CHNG proposed the “Two Lines” and “Two Integrations” strategy, focusing on building a high-quality and efficient offshore wind power development belt with large-scale bases, integrating investment, construction, operation and maintenance. Since then, the “east-line” strategy targeting the offshore wind was initiated officially.

Under the guidance of the Work Program on Implementing the Strategic Cooperation Agreement between Jiangsu Province and Huaneng Group, Huaneng Jiangsu Branch started to prepare the development plan for 10,000 MW offshore wind power, to further strengthen the technical progress of offshore wind power equipment design, manufacturing, construction and operation and maintenance, actively facilitate the construction of Yancheng offshore wind power R&D and manufacturing bases, and vigorously promote the integration of construction, operation and maintenance of offshore wind power

bases. While innovating business models and striving to obtain high-quality resources, Huaneng Jiangsu Branch deepened the strategic cooperation with upstream and downstream leading enterprises, to fully exert their respective advantages to form an industrial cluster combining resource development and utilization, technology and equipment R&D, and clean energy supply. This has been strongly supported by Jiangsu Provincial Government and relevant departments.

In 2017, Huaneng Rudong Baxianjiao, the first 300 MW offshore wind farm put into commercial operation in Asia, was completed; in 2019, Huaneng Dafeng Offshore Wind Project (Phase I) was completed successfully, and in the next step, CHNG will fully promote the construction of Dafeng (Phase II), Sheyang, Guanyun, Rudong H3, Qidong and other offshore wind projects.



Dafeng Offshore Wind Farm Project Put into Operation



# CHNG Commitment

## Deeply Involved in the Belt and Road Initiative



### Interpretation of Hot Words about the 70th Anniversary • The Belt and Road Initiative

On April 26, 2019, Xi Jinping said at the opening ceremony of the Second Belt and Road Forum for International Cooperation: "The Belt and Road cooperation embraces the historical trend of economic globalization, responds to the call for improving the global governance system and meets people's longing for a better life. Going forward, we should focus on priorities and project execution, move forward with results-oriented implementation, just like an architect refining the blueprint, and jointly promote high-quality Belt and Road cooperation."



**InterGen**  
Total installed capacity: 4,215 MW

- ⦿ In July 1998, Rocksavage Power Plant in the UK was put into operation
- ⦿ In December 2001, Coryton Power Plant in the UK was put into operation
- ⦿ In September 2004, Spalding Power Plant in the UK was put into operation
- ⦿ In April 2011, CHNG and Guangdong Energy Group (formerly known as Yudean Group) acquired 50% equity of InterGen
- ⦿ In July 2019, Spalding OCGT Project in the UK was put into operation



Rocksavage Power Plant in the UK



**Pakistan Sahiwal Coal-fired Power Plant**  
Total installed capacity: 1,320 MW

- ⦿ In May 2014, the Power Project was launched
- ⦿ On May 24, 2017, the 168-hour full-load test run for Unit 1 was completed
- ⦿ On June 8, 2017, the 168-hour full-load test run was completed for Unit 2, indicating the first major energy project of China-Pakistan Economic Corridor was officially completed
- ⦿ In July 2017, the Power Plant was completed and put into operation



Pakistan Sahiwal Coal-fired Power Plant



**Myanmar Shweli River I Hydropower Station**  
Total installed capacity: 600 MW

- ⦿ In February 2004, the Power Project was launched
- ⦿ In August 2006, Yunnan United Power Development Co., Ltd. was established to invest in the development of the power station in BOT mode
- ⦿ In December 2006, the river closure was achieved for the construction of the Power Station
- ⦿ In September 2008, the first unit of the Power Station was put into operation for power generation
- ⦿ In April 2009, the 72-hour test run was completed for Unit 6, and the whole power station was put into operation for power generation



Myanmar Shweli River I Hydropower Station



**Lower Sesan II Hydropower Station**  
Total installed capacity: 400 MW

- ⦿ In October 2013, the Power Project was launched
- ⦿ In January 2017, all intake gates of the powerhouse were lowered to retain water, and the third stage cofferdam was successfully closed
- ⦿ In September 2017, Cambodian Prime Minister Hun Sen attended the impoundment ceremony of the Power Station
- ⦿ In October 2018, all eight units of the Power Station were put into operation for power generation
- ⦿ In December 2018, the Power Station was completed and put into operation



Cambodia Lower Sesan II Hydropower Station



**Tuas Power Ltd.**  
Total installed capacity: 2,610 MW

- ⦿ In March 2008, CHNG acquired 100% equity of Tuas Power Ltd.
- ⦿ At the beginning of 2011, Tuas Power Plant CCP5 Project started
- ⦿ In 2013, CCP5 Project was officially put into operation
- ⦿ In March 2013, the first phase of Tembusu Power Plant was put into operation
- ⦿ In June 2014, the second phase of Tembusu Power Plant was put into operation



Tembusu Power Plant in Singapore



**OzGen B.V.**  
Total installed capacity: 1,770 MW

- ⦿ In November 2001, CallideC Power Plant was put into operation
- ⦿ In February 2003, Millmerran Power Plant was put into operation
- ⦿ In December 2003, CHNG purchased 50% stake in OzGen B.V.



Millmerran Power Plant in Australia



# Part I

## As a Role Model among Chinese Companies, CHNG Carries out Practical Actions to Help China Thrive

Optimize the Industrial Layout	20
Comprehensively Upgrade the Development Quality	22
Build Partnership Platforms	26
Create a Moderately Prosperous Life	32

Contribute Chinese Wisdom on the International Stage	42
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### Hard Work Makes the Nation Flourish with Goals

“Empty talk harms the country and hard work makes it flourish. We, this generation of communists, must build on past successes to further advance our cause, improve our Party, unite with all sons and daughters of the Chinese nation to build our country and develop our nation, and continue to boldly advance toward the goal of the great rejuvenation of the Chinese nation.”

— Xi Jinping

Excerpt from Xi’s speech at the exhibition “The Road of Rejuvenation”

### Responsibilities of a Role Model among Chinese Companies

**Optimize the industrial layout:** continuously improve the construction of intelligent supply chain platform for commodities, set up Shanghai e-commerce logistics branch, and establish three branches in national key service areas.

**Comprehensively upgrade the development quality:** formulate the Implementation Opinions on Promoting High-quality Development and the work program, and define the strategic direction of high-quality development.

**Build partnership platforms:** the installed capacity reached 6,878 MW and 1,739 MW respectively for initiated and approved cooperative projects between CHNG and other enterprises.

**Create a moderately prosperous life:** CHNG has been rated as “Good” (the highest grade) in the annual targeted poverty alleviation work evaluation by the State Council Leading Group of Poverty Alleviation and Development for three consecutive years.





# Optimize the Industrial Layout



## Call of the Party

“A successful enterprise must concentrate on its main business before reaching the summit of its development. Cross and mixed operation goes with the development of main business, rather than speculation for profit.”

— Xi Jinping

### International Guidelines



### Huaneng's Action



Installed capacity of power plants at home and abroad

# 182.78

GW

Year-on-year growth rate

# 3.52

%



Coal production output

# 74.5

million tons

Year-on-year increase

# 3.64

million tons

## Focus on the Development of Power Sector

CHNG sticks to the essential responsibility of ensuring stable power supply, with power sector as the core. In 2019, CHNG's cumulative power generation reached 705.7 billion kWh at home, with a year-on-year growth rate of 0.44%; the installed capacity of wholly-owned and holding power plants at home and abroad reached 182.78 GW, with a year-on-year growth rate of 3.52%. The annual merchant electricity quantity was 289.1 billion kWh, accounting for 52.99% of the total, with a year-on-year growth rate of 3.56%; the average utilization hours of all sizes of power generation equipment was 4,024 hours, ranking first among peers.

## Rational Development of Coal Sector

Amid the steady growth of the company's coal sector, CHNG issued the guidance opinions on the optimization of coal sector, and defined the five development principles of “clear positioning, preferential development, combined coal and electricity development, stable production and potential tapping, capacity expansion and efficiency improvement”. In 2019, the company's profit from coal sector reached RMB 1.892 billion yuan, an increase of RMB 391 million yuan year on year; the annual output of coal was 74.5 million tons, an increase of 3.64 million tons year on year; the sales volume was 57.18 million tons, an increase of 2.48 million tons year on year.

While ensuring the improvement of internal benefits, the coal sector of the company actively provided strong support for its main power sector, and fully guaranteed the internal coordinated supply of coal. Coal enterprises supplied 49.45 million tons of thermal coal for Huaneng's power plants.



Industrial Site of Xinyao Coal Mine

## Focus on the Development of Transportation Sector

The synergy between ports and the power sector have been further enhanced. In accordance with the strategy of “off-season reserve and in-season consumption”, Caofeidian Port had 911,000 tons of coal in storage during the peak period of coal consumption, effectively guaranteeing the thermal coal supply for the company's plants fired with water-transported coal. In 2019, Huaneng Caofeidian Port Co., Ltd. made profits in its first year of operation, with a profit of RMB 56.45 million yuan; the annual outbound volume was 33.48 million tons and the inbound volume was 33.64 million tons.

Huaneng's shipping fleet focused on serving the power sector of the company, and completed the freight transport of 84.21 million tons the whole year, including 42.77 million tons, 33.38 million tons and 8.06 million tons respectively realized by Ruining (Ruitong), Times Shipping and Hualu Shipping.



Bird's Eye View of Huaneng Caofeidian Port

Huaneng has continuously improved the construction of intelligent supply chain platform for commodities and actively improved the investment layout of supply chain industry by establishing Shanghai e-commerce logistics branch and three branches in national key service areas. Huaneng's Internet of vehicles has been registered in 10 provinces and operated in nearly 30 cities, with more than 400,000 registered vehicles. The brand influence of the supply chain platform has been further enhanced. Huaneng Commodities has been successfully selected as “The First Batch of National Supply Chain Innovation and Application Pilot Units” and “Industrial E-commerce Demonstration Pilot Enterprise in 2019” by the Ministry of Industry and Information Technology (MIIT).

“Through the Huaneng Commodities intelligent supply chain integrated service platform, China Huaneng has built innovative enabling systems of ‘Energy’ series, effectively promoting the digital transformation of the industry.”

— Li Ying, Inspector of Information and Software Service Department of MIIT

## Strengthen the Development of Science and Technology Sector

CHNG has thoroughly implemented the requirements of the CPC Central Committee on scientific and technological innovation, strengthened the top-level design of scientific and technological innovation, prepared and set up a science and technology venture capital fund, made significant progress in tackling key technologies in a large number of core fields, and significantly enhanced the vitality of scientific and technological innovation, providing strong technical support for the implementation of the “Two Lines” and “Two Integrations” development layout.

## Explore the Development of Financial Sector

CHNG actively builds a financial investment and financing platform, constantly optimizes financial asset management, and strives to optimize the financial holding platform by adhering to the concept of value co-creation, equal emphasis on management and service. By seizing the opportunity of listing, Great Wall Securities achieved leapfrog development and improved the comprehensive ranking and subdivision business ranking; Alltrust Insurance effectively executed its strategy, focusing on the sound development in new fields such as guarantee insurance, health insurance and international business.



# Comprehensively Upgrade the Development Quality



## Call of the Party

“High-quality development is the fundamental requirement for doing a good job in economic work. High-quality development is the development that embodies the new development concepts and the economic development changes from ‘Is it enough?’ to ‘Is it good enough?’”

— Xi Jinping

### International Guidelines



### Huaneng's Action



Operating revenue RMB

# 306.19

billion yuan

Year-on-year increase

# 9.89

%



Profit RMB

# 17.85

billion yuan

Year-on-year growth rate

# 24.28

%

## Value Maintenance and Appreciation of Assets

As an important state-owned enterprise, Huaneng upholds the essential responsibility of maintaining and increasing the value of state-owned assets. In 2019, Huaneng's operating performance was greatly improved, with an operating revenue of RMB 306.19 billion yuan, a year-on-year increase of 9.89%, and a profit of RMB 17.85 billion yuan, a year-on-year increase of 24.28%, over-performing the evaluation indicators of SASAC. The company's growth rates were significantly higher than the average level of similar enterprises, and all its industrial sectors were profitable.

Huaneng highlighted the disposal of troubled enterprises and inefficient & invalid assets. In 2019, Huaneng verified the assets and capital of 27 affiliated enterprises and disposed of 23 insolvent enterprises. The operating loss of Huaneng headquarters was reduced by RMB 1.3 billion yuan, the loss of grass-roots enterprises was decreased by RMB 3.8 billion yuan year-on-year, and the number of loss-making enterprises was decreased by 35%. The 119 key loss-making enterprises reduced losses by RMB 10.77 billion yuan as a whole, exceeding the target of reducing losses by 20%.



119 loss-making enterprises reduced losses by RMB

# 10.77

billion yuan

## Reform of State-owned Enterprises

Huaneng has formulated the Implementation Opinions on Promoting High-quality Development and the work program, and defined the strategic direction of high-quality development. Moreover, the company thoroughly implemented the spirit of the meeting on reforms of state-owned enterprises, formulated the Key Work Arrangements for Deepening Reform in 2019, identifying 8 aspects and 49 reform tasks, including accelerating the cultivation of world-class enterprise with global competitiveness and promoting the comprehensive reform.

Huaneng actively implemented the steps of creating a world-class enterprise, with the goal of “striving within 3 years and ensuring within 5 years to rank as a world-class enterprise with global competitiveness assessed by SASAC”, and formulated the Work Program for Creating a World-class Enterprise with Global Competitiveness, by benchmarking the 8 demonstration enterprises, such as State Grid, and studying the efforts of SPIC and other enterprises.

By setting up a special working group, establishing a monthly supervision mechanism and working record, and convening the quarterly promotion meeting, Huaneng promoted the implementation of the reform measures regarding the “Double Hundred Enterprises Program”. In 2019, after a phased assessment, four enterprises of Huaneng in the “Double Hundred Enterprises Program” completed 32 out of the 68 specific reform tasks.

## Promote the Management of Enterprises according to Law

Huaneng has actively promoted the construction of the rule of law, completed the follow-up inspection as required by SASAC on the performance of the first responsible person for promoting the construction of the rule of law, and obtained a high evaluation result. The follow-up inspection was carried out synchronously in the important enterprises of Huaneng, and extended to the grass-roots level, with concrete responsibilities assigned to specific persons.

Huaneng organized law publicity and educational exchange activities, participated in the “Rule of Law Lecture” activities organized by SASAC, and more than 1,300 employees got trained. Huaneng Xinjiang Energy Development Co., Ltd. was selected as the candidate of advanced collective in law popularization by SASAC. In addition, the company actively participated in the workshops on the rule of law of central SOEs in the power industry, effectively promoting the exchange in legal work of enterprises in the industry.

“Huaneng is an explorer of China's electric power reform and a front-runner in the field of electric power. Huaneng has made important contributions to ensuring the safe and stable supply of electric power, promoting the clean development of electric power, leading the progress of electric power science and technology, and accelerating the ‘going global’ of electric power enterprises.”

- Zhang Jianhua,  
Secretary of the Party  
Leading Group and  
Chairman of National  
Energy Administration



“Huaneng conscientiously implements the basic strategy about the law-based governance of the country, and solidly promotes the construction of ‘law-based governance of Huaneng’ according to the requirements of SASAC. The person-in-charge of CHNG conscientiously performs the duty as the first responsible person for promoting the construction of the rule of law, and CHNG’s work on rule of law is characterized with ‘operating in compliance with the law, in-depth legal research, and remarkable achievements in law popularization and publicity.’”

—Wu Jianghong,  
Leader of the SASAC  
Third Inspection Group

## Integrity and Compliance Management

Huaneng strictly implemented the requirements of SASAC for the construction of the compliance system, comprehensively carried out the work in combination with the actual situation, cultivated the compliance awareness of all employees in the whole process. The company carried out the pilot compliance work in China Huaneng Group Hong Kong Co., Ltd. and Huaneng Lancang River Hydropower Inc., and promotes the integration of compliance management with legal risk prevention, supervision and audit, so as to ensure the effective operation of compliance management system.

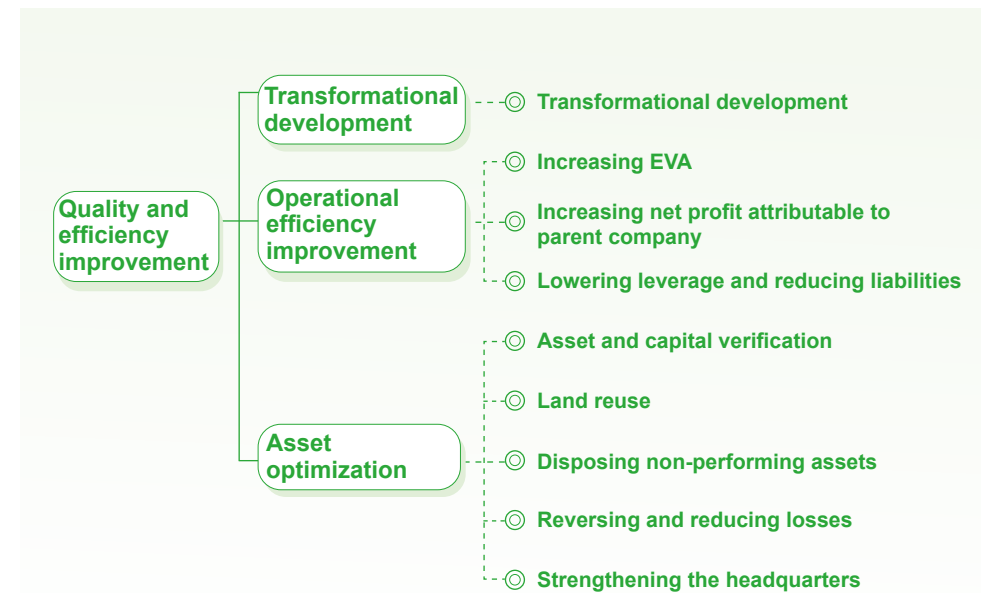
### Case: High international credit ratings awarded to Huaneng

In September 2019, Fitch, Moody, and Standard & Poor officially issued announcements respectively stating that CHNG was awarded the corporate credit ratings A, A2 and A- and the rating outlook was stable, reflecting the international rating agencies’ high recognition of Huaneng’s credit qualification, which was conducive for the company to implementing the “Going Global” strategy, further improving the international market image, and optimizing the global investment presence.

## Reduce Cost, Improve Quality and Increase Efficiency

Huaneng worked to improve quality and efficiency, implemented detailed top-level design, and formulated nine special sub-plans covering, among others, transformational development, reversing and reducing losses and strengthening the headquarters, centering on three key sectors, i.e. transformational development, operational efficiency improvement and asset optimization. A “1-3-9 program” system for quality and efficiency improvement was established.

Huaneng set up a leading team with the Chairman serving as the leader responsible for overall coordination and balanced development, and three special working groups with Vice Presidents serving as the group leaders in combination with three key sectors, to focus on the implementation of each work. A total of 109 key tasks for quality and efficiency improvement had been sorted out throughout the year, and the implementation thereof had been tracked regularly.



Key tasks identified to improve quality and efficiency

109

## Intensify risk prevention and control

Huaneng pushed forward risk prevention and control effectively, and brought the major risk prevention and control responsibilities into the Assessment and Evaluation Index System of the Party Building Responsibility System, so as to better play the leading role of the Party Leading Group in preventing and mitigating major risks and the powerful role of grassroots Party organizations. In 2019, Huaneng revised the annual risk management report, identified 9 major risks and 44 risk factors, and formulated 46 specific prevention and control measures. In the middle of the year, the company re-assessed the major risks and investigated more than 2,500 risk points, to make sure risks were controllable and the operation went smoothly.

Huaneng systematically revised the internal control system of the headquarters and the internal control standards of related industrial sectors, with a “1+7” internal control system formed, 1,295 risk points identified, and 1,526 control measures improved. Huaneng assesses the internal controls regularly. In view of existing problems and focusing on the efficiency improvement of internal control management, the company studied and sorted out the evaluation indicators for internal control maturity, and revised the Implementation Rules of Risk Management and Internal Control Assessment.

## Build an Intelligent Huaneng

In 2019, the building of an intelligent Huaneng was carried out in an orderly manner, and the focus of IT efforts of the company gradually changed from “support” in management IT to “leading” in production IT. In line with the change of work focus, the company established a “1+9+N” system for IT management, to expand the IT coverage of business management and develop the IT talent team for a “full coverage” of IT management.

- ◎ The hydropower sector has been fully covered by Industrial Internet and the pilot intelligent application in thermal power sector has been proved successful
- ◎ The intelligent level of coal-fired power station, offshore wind power, coal mine safety and other fields was continuously improved
- ◎ Huaneng Cloud Data Center was officially put into operation
- ◎ Unattended operation was achieved in Nuozhadu Hydropower Station in Yunnan Province





# Build Partnership Platforms



## International Guidelines



## Huaneng's Action



Sahiwal Coal-fired Power Plant was rated as

**“2019 Most Stable and Reliable Power Plant in Pakistan Power Grid”**



Huaneng signed purchase contracts or agreements valued at RMB

**11.08**

billion yuan at the 2nd China International Import Expo



## Call of the Party

“While the BRI was launched by China, its opportunities and outcomes are shared by the world. The Belt and Road cooperation is a long-term endeavor and a common cause of all its cooperation partners.”

— Xi Jinping

## Develop the Overseas Market

### Strengthen the Top-level Design

Huaneng constantly improves its international business system, focuses on building a new international pattern of “Unified Planning, Overall Coordination, Teamwork, and Intensive Development”, and plans to form a development layout of “three lines and one region” (west line, central line, south line and South America Region).

In 2019, the company continued to push forward the construction of an international platform featuring “one body and two wings”, and took the opportunity of deepened Belt and Road cooperation to set up six overseas representative offices respectively in the UK, Pakistan, Myanmar, Cambodia, Singapore and Kazakhstan, and completed the second batch of international talent selection and training. In this way, the international management system and mechanism are further improved and the management level is promoted continuously.

### Improve Overseas Guarantee

Huaneng has made great efforts to improve the management and service level of foreign affairs, revised 4 foreign affair systems, and strengthened the service guarantee of foreign affairs. In this year, the company dispatched 208 visiting groups (880 person times, with 100% visa granted), and invited 12 foreign visiting groups (30 person times). Moreover, there was no violation of regulations and disciplines on foreign affairs. All these provided powerful foreign service guarantee for the development of the company.

The company attaches great importance to overseas public security management, strengthens the collection and research of overseas security information, and fulfills the early warning and emergency guidance of overseas emergencies. Additionally, the company adheres to the combination of daily management and key-point management, and develops overseas security management APP, for the full coverage and real-time informatization of Huaneng's overseas institutions and personnel safety management. The company also continuously improves its overseas security emergency training system. In 2019, more than 600 people received training, and the management goal of “no dispatch without training” for overseas projects was realized for the first time.

### Carry out International Exchanges

In pursuit of the philosophy of “International Exchanges Serve the Overall Diplomacy of the Country”, Huaneng attended the Second Belt and Road Forum for International Cooperation, the 2nd China International Import Expo, China Development Forum, Understanding China Conference in Guangzhou, Summer Davos, World Energy Congress, and other foreign-related activities to increase brand recognition.

The company actively plays its role in international cooperation. In this year, the company carried out six exchange activities about cutting-edge technologies with GE, Siemens, and Japanese technology exchange delegations, etc., and conducted in-depth exchanges and discussions on international energy transition, clean energy development trend, offshore wind power technology and other topics, functioning to accelerate the company's technological innovation and energy transition.

“As a pioneer in China's power generation industry, Huaneng has strong scientific and technological strength and mature development experience. Voith GmbH is willing to continue to give full play to our technology and brand advantages to provide better products and services for Huaneng, for the purpose of mutual benefit and common development.”

— Dr. Hubert Lienhard, Chairman of Shareholders Committee and Chairman of Supervisory Board of Voith GmbH

## Case: Power Market Research Report jointly issued by Huaneng and ENEL

In April 2019, Huaneng and ENEL jointly held a seminar on “Power Market Design during Energy Transition”, and released the Research Report on the Design of EU and Chinese Power Market during Energy Transition. The report presents the innovative practices of EU and China in the design and improvement of power market for re-electrification and clean energy consumption during energy transition. This cooperation serves as a reference for the transformation and development of Huaneng, and provides a useful reference for China's energy transition and power market design.



## Case: CHNG actively participated in the 2nd China International Import Expo

For participating in the 2nd China International Import Expo, Huaneng established procurement sub-groups, formulated a work program, defined procurement requirements, developed a purchase demand online system, and seriously prepared for the on-site signing. During this CIIE, Huaneng signed procurement contracts or agreements valued at RMB 11.076 billion yuan with 19 suppliers, including 9 intelligent high-end equipment projects with a contract amount of RMB 3.671 billion yuan. The number of participants, and the number and amount of intelligent high-end equipment contracts made by the company in this CIIE exceeded the first CIIE.



Huaneng participated in the 2nd China International Import Expo



Overseas investment USD

**3.20** billion

Overseas controllable installed capacity

**9.44** GW

## Promote Project Construction

Huaneng actively promoted international development to create high-quality power projects, which can be found in the UK, Myanmar, Cambodia, Pakistan and other countries, with coal-fired power plants, natural gas power plants, hydropower stations as the mainstays. The overseas sector of the company achieved a profit increase by RMB 960 million yuan on a year-on-year basis, and InterGen has made profits for three consecutive years. By the end of 2019, the accumulated overseas investment of the company reached USD 3.20 billion, and the controllable installed capacity was 9.44 GW.

- ① Myanmar Shweli River I Hydropower Station generated 3.72 billion kWh in 2019, and the electricity supplied to Myanmar accounted for 1/3 of the country's national grid capacity
- ② Pakistan Sahiwal Coal-fired Power Plant has an annual power generation capacity of about 9 billion kWh, equivalent to 10% of Pakistan's national power generation, effectively promoting the power structure adjustment of the country
- ③ Lower Sesan River II Hydropower Station provides Cambodia with about 2 billion kWh of clean energy every year, effectively alleviating the local power shortage
- ④ The 100 MW Minety Battery Storage Project in the UK, the largest battery storage project in EU, commenced construction
- ⑤ The 300 MW Spalding Gas-fired Power Project in the UK became profitable immediately after being put into operation
- ⑥ The preliminary work on projects in Kazakhstan, Australia, Vietnam progressed steadily



Pakistan Sahiwal Coal-fired Power Plant



Lower Sesan River II Hydropower Station

“The construction of Sahiwal Coal-fired Power Plant embodies the Spirit of China, which is also called Sahiwal Spirit. We invite Chinese and Pakistani journalists to show the outcomes of a major project in China-Pakistan Economic Corridor to the people of China and Pakistan and the people of the world.”

—Zhao Lijian, then Minister Counselor of the Chinese Embassy in Pakistan



Myanmar Shweli River I Hydropower Station



100 MW Minety Battery Storage Project in the UK

## Drive Local Development

Sahiwal Coal-fired Power Plant strengthened management measures to ensure safe and stable operation of units, and was rated as the “2019 Most Stable and Reliable Power Plant in Pakistan Power Grid”, giving strong support to the national power grid of Pakistan. By the end of 2019, the power plant had generated 21.8 billion kWh of electricity, meeting the power demand of 4 million households and more than 20 million people in Pakistan. The power plant not only greatly alleviates the power shortage in Pakistan, but also makes great contributions to local talent cultivation, environmental protection and other livelihood aspects, fully promoting the national development of Pakistan.

## Case: Help Pakistan cultivate talents

In August 2019, Huaneng founded Huaneng Ruyi Technical Training School in Pakistan, with the purpose of “Enhancing Students’ Skills, Cultivating Skilled Talents, Practicing Social Responsibility, Promoting China-Pakistan Friendship”, to provide professional technical training for local community free of charge. By the end of 2019, the school had offered two training courses of cognitive practice of electric power production for college students and one training course of Chinese language to nearly 100 students, which were highly praised by the local government and universities, and effectively promoted local employment.



Group Photo of the First Graduates of Huaneng Ruyi Technical Training School

## Case: Strengthen environmental protection and build a green power station

Sahiwal Coal-fired Power Plant attaches great importance to the plant greening. Since the start of construction, more than 50,000 trees have been planted, which is far more than the 30,000 trees required in the EIA document. The turf area has reached 152,182 square meters and the greenable area has been 100% covered. Moreover, an ecological wetland was built in the wide area of the power plant to effectively improve the ecological environment. In addition, the comprehensive utilization of wastewater is fully considered in the power plant, and the wastewater is directly used for plant greening to reduce external discharge. In July 2019, the power plant was awarded the 16th Annual Environment Excellence Award in the field of electric power and energy by the National Forum for Environment & Health (NFEH) of Pakistan.



Green Landscape of Sahiwal Coal-fired Power Plant



## Domestic Market Partnerships

### Support Local Development

The company renders full support to the deepening of the reform and opening up of Hainan Free Trade Zone by building a high-level development pattern with Hainan comprehensive energy services as the core, coordinated development of technology, finance, trade and service industries, and integration of electricity, gas, port, goods and carbon assets.

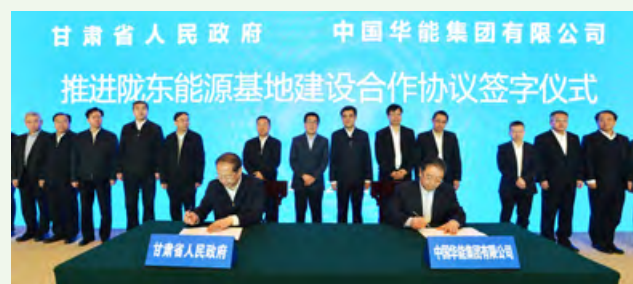
- ① Set up "two platforms": Supply Chain Platform Company and Yankuang Intelligent Logistics Company.
- ② Promoted the implementation of Hainan Changjiang Nuclear Power Phase II Project and Yangpu Natural Gas-fired Combined Heat and Power Project.
- ③ Established "two centers": Hainan International Energy Trading Center and International Carbon Emissions Trading Center.

### Build Cooperation Platforms

The company emphasizes "creating value together", innovates the business model, strengthens strategic cooperation with local governments, enterprises and associations, complements each others' strengths for coordinated and synergistic development and win-win results. In 2019, the company signed strategic cooperation framework agreements with Mingyang Smart Energy Group, China State Shipbuilding Corporation Limited, Huawei Technologies Co., Ltd. and other enterprises, and the cooperative projects initiated amount to 6878 MW, including 1739 MW that has been approved by the government.

### Cases: The company signed strategic cooperation agreements with Gansu, Jiangsu, Inner Mongolia Autonomous Region and Tibet Autonomous Region successively

Relying on the strategic layout of "Two Lines" (north line and east line) and "Two Integrations" (integration of wind, photovoltaic, coal, electricity transmission and consumption, and integration of offshore wind power investment, construction, operation and maintenance), the company has created "four strategic fulcrums": the clean energy base in eastern Gansu Province, the offshore wind power base in Jiangsu Province, the clean energy base in Inner Mongolia Autonomous Region, and the hydro-wind-solar hybrid energy base on the upstream of Lancang River. In 2019, the company signed strategic cooperation agreements with Gansu Province, Jiangsu Province, Inner Mongolia Autonomous Region and Tibet Autonomous Region. By adhering to the idea of large-scale development, and vigorously promoting green transition, the company has taken firm steps on the "four strategic fulcrums".



The company signed strategic cooperation agreements with Gansu, Jiangsu, Inner Mongolia and Tibet successively

## Improve the Level of Responsible Procurement

In 2019, the company completed a total procurement amount of RMB 110.50 billion Yuan, saving a total of RMB 21.04 billion Yuan compared with the budgetary estimate, with a capital saving rate of 15.99%. The six procurement indicators, namely the centralized procurement rate, the on-line procurement rate, the public procurement rate, the electronic bidding rate, the suppliers' dynamic quantitative assessment rate and the procurement quality control coverage rate, were all at 100%, reaching SASAC's "advanced level" standard. The open bidding rate of the projects subject to public bidding was 100%.

### Optimize Procurement Management

The company attaches great importance to procurement management, takes "compliance management, technological innovation, and providing responsible products" as the basic requirements for supplier selection, and strictly implements the review process of "registration, application, review, approval, publicity and listing" to ensure the procurement quality. In 2019, the company comprehensively optimized the procurement system, revised 14 systems and abolished 2 systems. The company set up a leading group and work coordination group for standardization and structuring of bidding and procurement documents, and organized and completed the standardization of 46 centralized procurement bidding documents.

The company further promoted inspection and rectification in the procurement field, comprehensively identified the problems existing in procurement system building, procurement process, supplier management, bid evaluation expert management and other aspects, formulated 7 rectification measures, and completed all rectifications by September 2019. During the rectification, the company conducted a thorough investigation over the procurement work of 47 subsidiaries and 298 grass-roots enterprises, carried out forewarning education and procurement management training for 2,211 procurement employees, and organized the assessment for 1,880 employees.

### Deepen Platform Application

The company further deepened the application of e-commerce platform and procurement management online platform, enriched the system functions of the two platforms, effectively increased the proportion of whole-process procurement, and improved the level of procurement transparency.

- ① E-commerce platform: The company's e-mall was officially launched in May 2019 and promoted to all its grass-roots enterprises, effectively regulating the procurement of office supplies and labor protective equipment.
- ② Procurement management online platform: Presently, the platform has 545 enterprise users. In 2019, the purchase plans released on the platform were valued RMB 71 billion yuan and 4,388 transfers of idle materials were completed here.

### Improve Procurement Quality

**Bid evaluation expert management:** The company refined the professional classification of experts, established an expert management information system, and completed the review on 7 batches of bid evaluation experts to be included in the expert pool. There were 6,378 experts in the pool, including 5,246 internal experts, accounting for 82.3%, and 1,132 external experts, accounting for 17.7%.

**Supplier management:** The company optimized the former three-level supplier management into two-level management, sorted out more than 57,000 suppliers in the supplier database, completed the assessment of 16,844 suppliers, urged 226 class-C suppliers to improve their service quality, and punished 124 class-D suppliers.

**Procurement benchmarking management:** The company released the comprehensive indicators for annual procurement and material management, realizing the on-line management of indicators, and ranked first in the power generation industry for the fourth consecutive year in the procurement benchmarking of state-owned enterprises organized by SASAC in 2019.



Sorting out more than

**57,000**  
suppliers

Assessing

**16,844**  
suppliers



# Create a Moderately Prosperous Life



## International Guidelines



## Huaneng's Action



Year-round donations for poverty alleviation RMB

**714**  
million yuan

Farmer-benefiting loans provided RMB

**600**  
million yuan



Technicians trained

**1318**  
persons

Entrepreneurial leaders cultivated

**251**  
persons



## Call of the Party

"The battle against poverty cannot be won easily. From a decisive achievement to an overall victory, the difficulties and challenges we face remain formidable, and we must not slacken our efforts."

— Xi Jinping

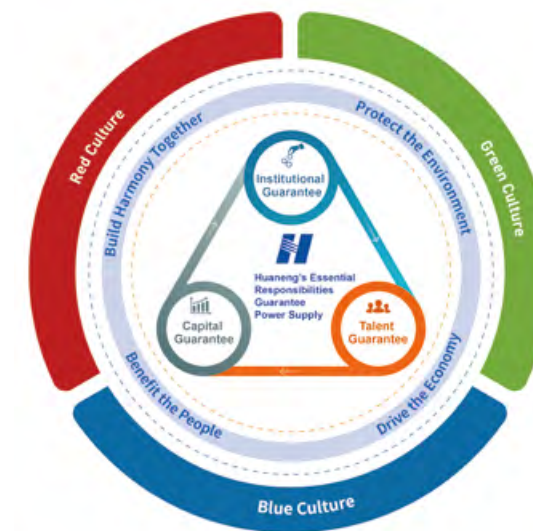
## Red Action Helped the Poverty Alleviation

### Deepen the Poverty Alleviation Management

### Innovate the Poverty Alleviation Model

Adhering to the poverty alleviation concept of "construct a power station, drive the local economy, protect the local environment, benefit the local people and build a harmonious society for local people", insisting on "ensuring the power supply" and centering on essential responsibilities, the company builds a management system with triple guarantee of systems, talents and capital. Under the guidance of "Three-color Culture", the company focuses on the four practical areas of "driving the economy, protecting the environment, benefiting the people, and building a harmonious society" and continuously explores a poverty alleviation mode with Huaneng characteristics.

With outstanding performance in targeted poverty alleviation, the company was awarded the "Good" evaluation (the highest level) for 3 consecutive years during the annual fixed-point poverty alleviation work assessment by the State Council Leading Group for Poverty Alleviation and Development.



"Huaneng has been at the forefront of the battle against poverty and has achieved remarkable results. I hope Huaneng continues to work hard, keep advanced and make further contributions."  
—Hao Peng, Secretary of the Party Committee and Chairman of SASAC of the State Council

"Huaneng Group has actively fulfilled its political and social responsibilities, harbored its profound friendship for the impoverished areas of ethnic minorities in border areas, and donated RMB 2 billion yuan to help the Lahu and Wa people in Yunnan Province to fight against poverty, achieving remarkable results."  
—CPC Yunnan Provincial Committee, People's Government of Yunnan Province

## Data of 2019 • Poverty Alleviation by Huaneng

Donations for poverty alleviation	Direct purchase of agricultural products	Agricultural product sales support	Poverty alleviation projects throughout the country	Distribution of fixed-point poverty alleviation tasks
RMB <b>714</b> million yuan	RMB <b>32.70</b> million yuan	RMB <b>12.16</b> million yuan	<b>219</b> counties (cities/districts)	<b>7</b> counties/districts <b>73</b> poverty-stricken villages
Work teams dispatched	Cadres dispatched	Poverty-stricken students financially aided	Medical assistance	Purchase of medical insurance
<b>43</b> teams	<b>203</b> persons	<b>4442</b> persons	<b>282</b> persons	<b>38028</b> persons
Party member cadres trained	Technicians trained	Skill training	Entrepreneurial leaders cultivated	Jobs afforded
<b>3304</b> persons	<b>1318</b> persons	<b>2287</b> persons	<b>251</b> persons	<b>187</b> persons



### Strengthen the Organization Construction

The company's Party Leading Group earnestly studied and understood a series of new arrangements and requirements of the CPC Central Committee and the Central Government for targeted poverty alleviation in the new era, made adjustments and established the leading group for poverty alleviation assistance, with the secretary and deputy secretary of the Party Leading Group and the Vice Presidents in charge acted as the group leader and deputy group leaders respectively, and defined the relevant responsibilities of the 12 member departments. Members of the leading group visited counties, townships and villages in different regions, and inspected the implementation of poverty alleviation projects on the spot.

The company actively urged all affiliated organizations to improve their working institutions and management systems, and to improve the three-level management system of poverty alleviation assistance. All affiliated organizations actively carried out targeted poverty alleviation and eradication in poverty-stricken areas throughout the country, and fully cooperated with local Party committees and governments in the battle against poverty.

### Build up Systems

In 2019, the company's Party Leading Group formulated and implemented the Opinions on Implementation of the "Red Action Plan" Work Scheme for Targeted Poverty Alleviation Campaign, making poverty alleviation a major ongoing task, focusing on areas in deep poverty, targeting the registered impoverished population and special poverty-stricken groups, taking innovative and targeted measures, and fully supporting poverty-stricken areas in winning the battle against poverty. In addition, the company included poverty alleviation work into the Party building work accountability assessment to improve the effectiveness of poverty alleviation efforts.

### Implement Poverty Alleviation Through Consumption

According to the Guidelines of the General Office of the State Council on Deepening Poverty Alleviation through Consumption to Help Win the Battle against Poverty, the company regarded poverty alleviation through consumption as an important part of poverty alleviation work, formulated the work plan for poverty alleviation through consumption that covered all units and employees, defined the purchase scope, index quota and means of the annual poverty alleviation tasks through consumption, and directly sold the agricultural products from fixed-point poverty alleviation assistance areas to the canteens of respective units.

The company strove to expand the circulation and sales channels of agricultural products in poverty-stricken areas, and created brands of characteristic agricultural products. In April 2019, the company held agricultural product production and marketing activities for poverty-stricken areas under fixed-point poverty alleviation, organized related subsidiaries and grass-roots enterprises to contact 10 enterprises from Hengshan District of Yulin City and Aheqi County, and signed purchase contracts totaling over RMB 3 million yuan and over 30 copies of purchase intentions on the same day. Meanwhile, the company developed a "Poverty Alleviation Public Welfare" section in the Huaneng Chengzhangbao APP, delivering the needs of the poverty-stricken areas to the mobile terminals of every employee in time. Agricultural products in fixed-point assistance areas were listed and sold in the "Good Products" mall of the Chengzhangbao APP. With unconditional and free help, all suppliers quickly stepped into the e-commerce, effectively promoting the development of featured products in poverty-stricken areas towards commercialization and e-commerce. In addition, the company also coordinated fixed-point poverty alleviation assistance counties to attend the 7th China Charity Fair, Sinopec Poverty Alleviation Trade Fair and other exhibition activities, expanding the brand influence and sales coverage of high-quality characteristic agricultural products of fixed-point poverty alleviation counties.

### Implement Poverty Alleviation Action

#### In Yunnan

Aiming at the weakness of "special ethnic groups", Huaneng Lancang River Hydropower Inc. has invested RMB 500 million yuan for four consecutive years since 2016, to assist the Lahu and Wa communities in Lancang, Cangyuan, Shuangjiang and Gengma counties, and successively dispatched seven cadres to take temporary posts in provinces, prefectures and counties for poverty alleviation of the "special ethnic groups". By the end of 2019, a total of RMB 2 billion yuan has been allocated to relevant counties, and the Cangyuan, Gengma and Shuangjiang counties have achieved the poverty eradication.



### Red Action Plan



Investing RMB

2

billion yuan to help "special ethnic groups"

**Provide housing guarantee and strengthen infrastructure construction.** The company has vigorously implemented infrastructure construction focusing on renovation of rural dilapidated houses, village road hardening and safe drinking water projects, which have greatly improved the working and living conditions of the poverty-stricken people. By the end of 2019, the company has completed the construction of affordable housing and renovation of dilapidated houses for 27,328 households, implemented poverty alleviation relocation for 40 households, built 166 kilometers of rural roads and 308 kilometers of village roads, hardened 648 kilometers of village roads, and built 179 projects to strengthen and upgrade drinking water safety.



Housing Demonstration Site in Nongtang Natural Village in Mangdi Village, Hepai Township, Gengma County

**Achieve stable poverty alleviation and strengthen the cultivation of characteristic industries.** The company vigorously implemented the improvement of sugarcane varieties, planting of vegetables, fruits and forage grass, breeding of cows and sows with high fertility, supported the standardized processing of tea and characteristic agricultural products, and promoted the development of handicrafts with national characteristics. By the end of 2019, the company has provided supports to 4 leading agricultural enterprises, developed 53 specialized rural cooperatives, cultivated 23 characteristic farmer households, planted 32,604 mu (about 2174 hectares) of cash crops, 13,610 mu (about 907 hectares) of economic fruit trees, developed 2,236 mu (about 149 hectares) of under-forest industries, raised 60,751 pigs, cattle, sheep as well as 21,740 chickens, ducks and geese, and developed 62 agricultural product processing industries and 47 households of handicrafts with national characteristics.

- Explore the "Huaneng + Technology + Poverty-stricken Households" cross-over collaboration pattern: the company provided RMB 3 million yuan and cooperated with the Chinese Academy of Engineering in the demonstration and promotion of poverty alleviation through technology by planting under-forest organic pseudo-ginseng and winter potato. The demonstrative planting of under-forest pseudo-ginseng promoted the employment of 3,324 people from 844 households, and a total of 300 technical leaders were trained; farmers got incomes ranging from about RMB 8,000 yuan to RMB 30,000 yuan per household. The demonstrative planting of potato achieved an average yield of 3.3 tons per mu, and the highest yield was 4.7 tons per mu; the average output value per mu was more than RMB 9,000 yuan, increasing by more than RMB 5,000 yuan.



Planting of Under-forest Organic Pseudo-ginseng



Planting of Winter Potato

- Explore an integrated production-marketing pattern of "Huaneng Assistance + Specialized Cooperatives + Poverty-stricken Households + Poverty Alleviation through Consumption": Based on the unique advantages of Wengda Village, Mengsa Town, Gengma County, the company carried out the apis cerana breeding based on the integrated production-marketing pattern. The specialized tea planting cooperative provided swarm, and the poverty-stricken households carried out intensive breeding at the base; the company provided industrial funds and technical guidance and recovered the products, and the power plant helped with the sales. By 2019, a total of 72 registered poverty-stricken households were lifted out of poverty.



Construction of affordable houses and renovation of dilapidated houses

27,328



Leading agricultural enterprises supported

4

Rural specialized cooperatives developed

53

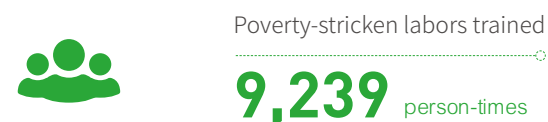


Poverty-stricken households lifted out of poverty

72



**Improve the ability to get rich, and focus on strengthening the scientific and technological culture training.** The company carried out trainings on tea primary processing, vegetable planting and other skills to greatly improve the ability of poverty-stricken people to get rich, and organized village cadres and entrepreneurial leaders to go out for "learning" and broadening their horizons. By the end of 2019, a total of 2,080 ethnic and rural cadres as well as 9,239 person-times of poverty-stricken labors have been trained.



### In Qinghai

In order to ensure that Jianzha County can get rid of poverty on schedule, the company invested RMB 12.24 million yuan to carry out the Student Aid Operation of Dongliang Project, Emergency Rescue Operation of Tongzhou (Mutual Supports) Project, Rejuvenating Farmer Operation of Blessing Project, etc.

**Student Aid Operation of Dongliang Project:** building the lecture classrooms of No.2 Ethnic Middle School; purchasing teaching and child rearing facilities for Maketang Kindergarten; investing RMB 400,000 yuan to purchase Ping An insurance for 11,056 students.

**Emergency Rescue Operation of Tongzhou (Mutual Supports) Project:** purchasing commercial supplementary health insurance and housing insurance for 3,744 poverty-stricken villagers and 806 poverty-stricken families.

**Rejuvenating Farmer Operation of Blessing Project:** investing RMB 8.80 million yuan to install 2.1 MW distributed photovoltaic power generation facilities on the roofs of 251 households in Dej Village, helping relocated people to steadily increase their income.



No. 2 Ethnic Middle School of Jianzha County



Full View of Dej Village, Jianzha County

### In Xinjiang

Huaneng Xinjiang Energy Development Co., Ltd. repaired the abandoned greenhouses in the fixed-point poverty-stricken villages of Jiashi County, and developed protected agriculture, for which the company invested a total of RMB 750,000 yuan throughout the year, including RMB 400,000 yuan for infrastructure repair and maintenance, and RMB 350,000 yuan for purchasing production materials such as seeds, fertilizers, greenhouse films and also employing technical experts. In November 2019, greenhouses had a good harvest of tomato, winning a large number of orders from farmers' markets, governments and restaurants, increasing the village collective income by RMB 140,000 yuan in just 2 months, and creating extra income for villagers able to work in slack farming seasons.



Good Harvest of Tomato in Greenhouses in Jiashi County

### In Tibet

Huaneng Tibet Hydropower Development Investment Co., Ltd. actively created employment opportunities for surrounding poverty-stricken people during the construction of Paizhen-Motuo Highway Project, employed 10 local people for long-term camp property management, and provided cumulatively 102 labor posts to local people. Under the coordination of the company, about 1.5 million m<sup>3</sup> of sand and gravel aggregate were purchased from the nearby village collective material yards, 14 local vehicles meeting the construction safety requirements were hired and more than 500 local people were employed for the construction of the project, expanding the channels of increasing income.



Entrance of Duoxiongla Tunnel of Paizhen-Motuo Highway in Tibet

### In Inner Mongolia

Since 2011, North United Power Co., Ltd. has started the fixed-point assistance to Baiyinhua Village, Jalaid Banner, Hinggan League by aiming at the objectives of ensuring the poverty-stricken people "do not have to worry about food and clothing and have access to compulsory education, basic medical services and safe housing", formulating the implementation plan 2018-2020 for targeted poverty alleviation assistance, and carrying out the poverty alleviation mainly in the aspects of renovating dilapidated houses, strengthening infrastructure, expanding the collective economy, assistance through industrial investment, etc. By the end of 2019, North United Power Co., Ltd. had cumulatively invested more than RMB 4.5 million yuan of assistance funds, and Baiyinhua Village had successfully passed the national acceptance of poverty alleviation.

### In Shaanxi

Huaneng Shaanxi Power Generation Co., Ltd. actively carried out poverty alleviation through industrial investment, provided RMB 5 million yuan in the construction of tourism homestay project in Huaxi Valley, Tongchuan City, and RMB 3 million yuan in the construction of community factory in Zhaojin Town, Tongchuan City. The two projects had been completed and put into operation, enabling poverty-stricken households to work in their hometown and realizing income increase. In 2019, Huaneng Shaanxi Power Generation Co., Ltd. was praised as an "Outstanding Enterprise in Helping Poverty Alleviation in Shaanxi Province".

### In Sichuan

Huaneng Sichuan Hydropower Co., Ltd. provided fixed-point assistance to Tuanjie Village in Zhaojue County and Yanggao Village in Aba County, and implemented more than 30 poverty alleviation projects including donations for education, agricultural development through industry, Party building, talent development, emergency relief, etc. By the end of 2019, a total of 715 poverty-stricken people from 178 households had been lifted out of poverty, and the two villages had got rid of poverty. The company was awarded the "Good" evaluation (the highest level) in the fixed-point poverty alleviation assessment of Sichuan Province.

"Huaneng has assisted Aba County for a long time, dispatched high-quality cadres, provided poverty alleviation funds and carried out practical poverty alleviation projects. Now, Yanggao Village assisted by Huaneng has become a high-quality model village in Aba County, and Huaneng has played an exemplary role among assistance-providing units and set a good example for other assistance-providing units."

—Chen Baohua, County Magistrate of the People's Government of Aba County



Kindergarten reconstructed with donation by the company in Tuanjie Village, Zhaojue County



## In Zhejiang

Huaneng Zhejiang Branch actively implemented the "Red Action Plan" and carried out several assistance projects including Student Aid Operation of Dongliang Project, Emergency Rescue Operation of Tongzhou (Mutual Supports) Project, and Rejuvenating Farmer Operation of Blessing Project.

**Student Aid Operation of Dongliang Project:** In September 2019, Huaneng Zhejiang Branch proposed that all the staff give their love and financial aid to the poverty-stricken students in Shan'ao Village, Sanmen County. More than RMB 20,000 yuan were donated together with a large number of books, clothes, school supplies, etc.

**Emergency Rescue Operation of Tongzhou (Mutual Supports) Project:** An assistance fund of at least RMB 100,000 yuan was raised every year to help low-income farmers in Shan'ao Village increase their income and get through difficulties.

**Rejuvenating Farmer Operation of Blessing Project:** An intensive tea processing and education base construction project was implemented in Shan'ao Village, and assistance fund of RMB 350,000 yuan was provided to renovate the tea processing base and purchase tea processing equipment, effectively improving the village collective economy and increasing the income of poverty-stricken households in the village.

## In Anhui

Huaneng Anhui Branch provided financial aid of RMB 50,000 yuan to each of the 10 poverty-stricken households without labor force in Huangchong Village, Huoqiu County to make them become a shareholder of specialized grain planting cooperative and participate in the "Shrimp Farming in Rice Fields" Project. The company invested nearly RMB 3 million yuan as the special poverty alleviation funds to build three water pumping stations and harden 2,862 meters of canals in the whole village, opening a waterway artery of the whole village and helping the increase in income and production of poverty-stricken households participating in the "Shrimp Farming in Rice Fields" Project. This project has been expanded to more than 6,000 mu (about 400 hectares), and the rice yield has reached 750 kilograms per mu, increasing the annual income of each household by more than RMB 5,000 yuan. The poverty rate in Huangchong Village has dropped from 13.86% in 2014 to 0, which has been highly recognized by the local government and the masses.



"Shrimp Farming in Rice Fields" Project of the specialized grain planting cooperative in Huangchong Village, Huoqiu County

## In Hubei

Huaneng Central China Branch provided fixed-point assistance to Shiziyuan Village, Shiyan City, and donated RMB 1 million yuan of industrial assistance fund cumulatively from 2018 to 2019, which was invested in Hubei Wudang Deer Industry Limited by the specialized agricultural cooperative of the village, and the village collective can receive dividends of RMB 100,000 yuan every year. Meanwhile, the company assisted the specialized agricultural cooperative to take the lead in planting 11 mu (about 0.7 hectares) of konjac, leading 29 households to try to plant nearly 20 mu (about 1.3 hectares) of konjac and effectively expanding the channels for increasing the income of poverty-stricken households. In April 2019, Shiziyuan Village was successfully lifted out of poverty.

## In Jiangxi

Huaneng Jiangxi Branch provided assistance fund of RMB 450,000 yuan to build resettlement community for extraordinarily poverty-stricken households in Longkou Village, Poyang County, so as to solve the problem of six poverty-stricken homeless households having no land or money to build their houses. In addition, the company continues to support the people's public welfare undertakings in Longkou Village, build the elderly leisure station in the village, provide the elderly with a place for leisure and entertainment, promote the transformation of social traditions and improve the quality of later life.

## In Gansu

Since 2017, Huating Coal Industry Co., Ltd. has established fixed-point assistance relationship with 6 poverty-stricken villages including Shihe and Shanglu in Jingning County, Pingliang City, and made every effort to carry out the poverty alleviation through careful planning and targeted measure implementation. By March 2020, a total of RMB 13.19 million yuan has been invested, and 181 households from 6 poverty-stricken villages have been all lifted out of poverty.

## Other regions

Huaneng Hebei Zhuolu Clean Energy Co., Ltd. donated RMB 620,000 yuan of poverty alleviation funds for Yinjiazhuang Village, Dabao Town, Zhangjiakou City, to harden the roads, install street lamps, reconstruct the garbage pool and improve infrastructure, thus improving the living standards of the local villagers.

Huaneng Yimin Coal & Power Co., Ltd. promoted the grid-connected power generation of 42.4 MW Photovoltaic Poverty Alleviation Project, helping 1,697 poverty-stricken households in Hulun Buir City get rid of poverty in a steady way.

Huaneng Fujian Xiapu Nuclear Power Co., Ltd. invested RMB 400,000 yuan to assist Huhe Village, Yongding District, Longyan City to build the Red Culture Theme Park, and it is expected to increase villagers' income by RMB 75,000 yuan per year.

Jiangsu Huaiyin Power Plant assisted the mulberry leaf tea factory project in Sangcan Village, Huaiyin District, Huai'an City and provided support in project construction, plant site selection and equipment procurement, effectively utilizing surplus mulberry leaf resources and achieving benefits of "turning waste into wealth, driving income increase and promoting employment".

Shandong Huangtai Power Plant donated RMB 506,000 yuan for the construction of diversion works in Hutuan Village, Licheng District, Jinan City, including the construction of new pumping well, reservoir and other water supply facilities. In July 2019, the diversion works were completed, helping villagers get rid of the age-old predicament of not having safe drinking water.

Guangdong Haimen Power Plant assisted Beimen Community, Haimen Town, Shantou City to improve the construction of mass service center and comprehensive cultural service center, activate the functions of the science popularization station, new era civilization practice station, etc. under the centers, and carry out the "Dongliang Project" education assistance series activities in different stages and forms.



"Dongliang Project" Education Assistance Activity in Beimen Community, Haimen Town, Shantou City

Jiangxi Jinggangshan Power Plant actively promoted the industrial assistance in Qiaoshang Village, Ji'an City. In 2019, it donated a special assistance fund of RMB 280,000 yuan for the "Huagang Specialized Farming and Breeding Cooperative Project", which effectively developed and strengthened the village collective economy and increased the income of poverty-stricken households.



Opening Ceremony of "Huagang Specialized Farming and Breeding Cooperative Project" in Ji'an City

Jiangxi Anyuan Power Plant invested over RMB 800,000 yuan for poverty alleviation assistance, to build Yanxi Village, Lianhua County into an advanced village in the battle against poverty and the Louxia Village into a municipal ecological village, and the two poverty-stricken villages and 6 poverty-stricken households were lifted out of poverty.



Tangtou Natural Village in Yanxi Village, Lianhua County

Fujian Fuzhou Power Plant donated RMB 1 million yuan for industrial poverty alleviation, and built 150kW distributed photovoltaic power station in Shangyang Village, Dehua County, with an annual electricity production of 165 MWh and an annual power generation revenue of about RMB 140,000 yuan.



Distributed Photovoltaic Power Station in Shangyang Village, Dehua County



Henan Qinbei Power Plant donated RMB 810,000 yuan to help Tanzhuang Village, Jiyuan City build a Party member and mass service center, organized 7 poverty-stricken households to set up a cooperative to develop mushroom cultivation, aquaculture and under-forest aquaculture industries, laying a good foundation for the poverty-stricken households to increase their income.

Jiangxi Ruijin Power Plant invested RMB 791,000 yuan of poverty alleviation fund cumulatively to carry out poverty alleviation in people's livelihood areas such as infrastructure construction and industrial development in Shihan Village, Ganzhou City, and the number of poverty-stricken people was reduced from 323 persons of 99 households to 5 persons of 5 households, which was unanimously recognized by the local government and highly appraised by the villagers.

Hunan Yueyang Power Plant invested RMB 1.35 million yuan of assistance fund cumulatively to repair village roads, install village street lamps, and construct safe drinking water works and so on in Yangliu Village, Pingjiang County. A total of 7 km of road was hardened, more than 10 km of water channel was repaired, the village's arterial road was landscaped, and safe drinking water became available for all villagers.

### Poverty Alleviation through Financial Services

Huaneng Guicheng Trust Co., Ltd. together with MYbank built the first asset-backed securities in China dedicated to rural revitalization and poverty alleviation, and made use of technological and financial services to help people become stronger and lift themselves out of poverty. In 2019, agriculture-benefiting micro-loans of RMB 600 million yuan were issued, providing financial support for the rural poverty-stricken people and entrepreneurial farmers.

Huaneng Guicheng Trust Co., Ltd. set up a charitable trust and raised more than RMB 2.7 million yuan of external funds, and a total of more than RMB 3.30 million yuan including employee donations and the company's poverty alleviation funds was invested to carry out poverty alleviation work in Hezhang County, granted more than RMB 60,000 yuan to nearly 200 poverty-stricken students, and assisted Guanfang Village and Fake Village in reconstruction of dilapidated houses, construction of drinking water works and school supporting facilities.

Huaneng Tiancheng Financial Leasing Co., Ltd. provided financing support for the Yangchun Zhongnengke 50 MW and Luanping Jingrun 60 MW photovoltaic poverty alleviation projects. Both projects have been put into operation, helping nearly 4,000 poverty-stricken households to increase their income. Each household will receive an average of RMB 3,000 yuan of poverty alleviation funds every year for twenty consecutive years, and the cumulative poverty alleviation funds will reach RMB 240 million yuan.

## Public Charity to Build a Beautiful and Harmonious Society

### Deepen Public Welfare Management

While vigorously carrying out targeted poverty alleviation, the company also focuses on carrying out traditional public welfare activities, bravely shouldering the responsibilities of state-owned enterprises in times of national crisis and emergency, caring about the disadvantaged groups in society, repaying the society with love and kindness, and demonstrating the patriotism of enterprises to the nation.

In 2020, since the outbreak of COVID-19, the company responded quickly and proactively, and took strong, orderly, science-based and thorough measures to strengthen the pandemic prevention and control in an all-round way and resolutely curb the spread of the pandemic. All affiliated organizations, while doing their respective pandemic prevention work well, earnestly fulfilled their social responsibilities by donating RMB 64.99 million yuan in total, including RMB 63.99 million in cash and about RMB 1 million in kind. Furthermore, we were devoted to ensuring power generation, heat supply and fuel supply, and providing robust power and heat support to all regions.



Total donation since the outbreak of COVID-19 reached RMB

**64.99**

million yuan

including RMB

**63.99**

million yuan in cash

about RMB

**1**

million yuan in kind

## Implement Public Welfare Actions

The company set up a youth volunteer service platform to carry out in-depth "Three-color Sail" youth volunteer service brand activities and call on the active participation of staff. By combining volunteer activities with Learning from Lei Feng, donating funds for education, environmental protection, poverty alleviation and other activities, the public welfare practice of enterprises were greatly enriched.

### Case: Dandong Power Plant Carried out "Set Sail Again with Original Aspiration, Efforts and Kindness" Youth League Activity

In March 2019, on the 56th National Lei Feng Memorial Day, the "Three-color Sail" volunteer service team of Dandong Power Plant came to Tongying Autistic Children Rehabilitation Training Center in Donggang City to carry out the Youth League activity of Learning from Lei Feng themed "Set Sail Again with Original Aspiration, Efforts and Kindness". Volunteers delivered rehabilitation equipment and office supplies to the children of the center and carried out a variety of exchange activities with the teachers and students of the center.



Youth League Activity of Learning from Lei Feng at Liaoning Dandong Power Plant

### Case: Huaneng Clean Energy Research Institute Carried out Education Assistance Theme Practice

In January 2019, Huaneng Clean Energy Research Institute organized 20 high school students from Hengshan High School in Shaanxi Province to carry out a series of research and learning activities. These students visited the company's labs, participated in the clean energy power generation science lectures, listened to "For the Dream of Blue Huaneng" key-note speeches, assembled micro wind power generation equipment in person, visited the large-scale exhibition on the 40th anniversary of reform and opening up to personally experience the rapid development of national history, culture and modern science and technology, broaden their horizons and strengthen their confidence and determination to become useful national talents.



Huaneng Clean Energy Research Institute - Hengshan High School Education Assistance Practice Activity

### Case: Huating Coal Industry Co., Ltd. Has Carried out Voluntary Blood Donation Activities for 17 Consecutive Years

Huating Coal Industry Co., Ltd. established a "Three-color Sail" Youth Volunteers Association in May 2002 to carry out regular volunteer services and various volunteer activities based on the spirit of "dedication, love, mutual aid and progress". Since 2002, the Association has carried out 19 activities of "Voluntary Blood Donation · Gratitude to the Society" for 17 consecutive years, and organized 1,771 volunteers to donate 390,670 milliliters of blood in the past 10 years, providing a strong guarantee for blood use of the coal mines and society. In 2019, a total of 162 volunteers donated 53,270 milliliters of blood, and the Association was awarded the honorary title of "Voluntary Blood Donation Promotion Award" jointly by the National Health Commission and the Logistics Support Department of the Chinese People's Liberation Army.



Huating Coal Industry Co., Ltd. Volunteer Service Activity themed "Voluntary Blood Donation · Gratitude to the Society"



# Contribute Chinese Wisdom on the International Stage

## President Xi Jinping Sent a Congratulatory Letter to the 83rd IEC General Meeting

At present, the green, low-carbon circular development has become a common goal of mankind. The deeply integrated development of new technologies such as artificial intelligence, big data and 5G with sectors including new energy power generation and electric vehicles etc. calls for immediate formulation and application of international standards in related fields as well as strengthened international cooperation.

China attaches great importance to standardization, advocates the application of international standards, supports high-tech innovations with high standards, so as to promote high-level opening-up and drive high-quality development. China will continue to actively support and participate in international standardization activities, and stands ready to work with other countries to constantly improve the system and governance structure of international standards, to give better play to the role of international standards in international trade and global governance.

Themed "Better Quality, Better Life", the 83rd IEC general meeting was held in Shanghai in October 2019, drawing nearly 4,000 representatives from over 100 national and regional IEC members, ISO, and other international and regional standardization organizations in Europe, Pan-America and Asia-pacific to attend this meeting. During this meeting, Dr. Shu Yinbiao, president-elect of IEC, Chairman of China Huaneng Group Co., Ltd., together with Mr. James M. Shannon, the current President of IEC, completed the transfer of IEC Presidency, and Dr. Shu Yinbiao delivered an inaugural speech thereafter.



China Huaneng Chairman and the Current IEC President Completed the Transfer of IEC Presidency

### Read More:

Founded in 1906, the IEC (International Electrotechnical Commission) is a globally recognized organization for the international standard setting and conformity assessment for all electrical, electronic and related technologies. It is one of the world's three most authoritative international standardization organizations including the International Organization for Standardization (ISO) and the International Telecommunication Union (ITU), and enjoys the reputation of "United Nations in the field of electrotechnology".

As the world's earliest international standardization organization, IEC is a global independent non-profit membership organization and a Class-A advisory body of the United Nations Economic and Social Council. The IEC family now covers 172 countries, including 86 members and 86 affiliates.

**Vision:** IEC everywhere for a safer, more efficient world.

**Mission:** Our mission is to achieve worldwide use of IEC International Standards and Conformity Assessment Services that ensure the safety, efficiency, reliability and interoperability of electrical, electronic and information technologies, to enhance international trade, facilitate broad electricity access and enable a more sustainable world.

At the 82nd IEC general meeting held in Busan, Republic of Korea in October 2018, Dr. Shu Yinbiao was elected the 36th IEC President for the tenure of 2020-2022. Since its establishment 112 years ago, IEC has for the first time a Chinese expert serving as its president, which is an important milestone for China to participate in the international standardization.

The company has completed a lot of preparatory work for the 83rd IEC general meeting, formulated the conference plan, made every effort to ensure the conference affairs support, kept close contact with the Press Department of State Administration for Market Regulation for comprehensive conference publicity, actively carried out researches on relevant topics, and completed the compilation of research reports such as "IEC Development History", "IEC Organization System", "IEC Statutes and Rules of Procedure" and "IEC Young Professionals Programme".



Venue of the 83rd IEC General Meeting

With the transfer of the 36th IEC presidency to China Huaneng Chairman Shu Yinbiao, the company has deepened its understanding that international standards are a passport for enterprises to enter the international market, and the importance of international standardization has become more prominent. In 2019, the company seized the opportunity of the 83rd IEC general meeting to carry out many practices and made major breakthroughs in international standardization, facilitating the international development of China's electric power industry, and enhancing the international influence of China's electric power enterprises in the field of electrotechnology.

- ◎ Established an international standardization expert pool of the company to concentrate superior forces on international standardization.
- ◎ Proactively assumed the role of assistant secretary of IEC/TC5 (steam turbines) and IEC/PC127 (low-voltage auxiliary power systems for electric power plants and substations), laying a good foundation for further international standardization work in related fields.
- ◎ The "General Requirements for Fossil Fuel Power Plants Corrosion Control Engineering Life Cycle", the first international standard proposed by the company, was approved to be initiated by ISO/TC156/SC1, symbolizing a breakthrough for the company in this field.

Next, China will be more deeply involved in major decisions of IEC and contribute its wisdom to IEC management and sustainable development. Chinese electric power enterprises will further play a leading role, actively promote the transformation of scientific and technological innovation results into technical standards, get deeply involved in the formulation of international standards, actively participate in global energy governance, promote major scientific and technological innovation, accelerate the resolution of major challenges such as global energy reform and the fourth Industrial Revolution, and better benefit the human society.

"In the future, IEC will closely follow the integration trend of electric power technology with 5G, AI and other new-generation information technologies, further play the leading role of standards in scientific and technological innovation. We will adhere to the concept of extensive consultation, joint contribution and shared benefits to continuously promote the IEC governance reform and improve the service capacity and level so that all members can enjoy open, fair and just services. In addition, we are committed to providing more opportunities for developing countries to participate in IEC governance, and jointly explore the positive role of standardization in improving global governance and promoting sustainable development, so that the world can share the huge benefits brought by scientific and technological progress."

— Shu Yinbiao, President of the International Electrotechnical Commission (IEC) and Chairman of China Huaneng Group Co., Ltd.

"Since its establishment 112 years ago, IEC has for the first time a Chinese expert serving as its president, which is an important milestone for China to participate in the international standardization, and another important achievement for electric power enterprises to implement the concept of "a community with a shared future for mankind" and actively promote the Belt & Road Initiative."

— "SASAC News Center" WeChat account



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# Part II

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### Finding the Right Direction to Serve the Country through Power Development

"China attaches great importance to low-carbon energy development and actively promotes energy consumption, supply, technology and institutional transformation. China stands ready to work with the international community to strengthen energy cooperation in all aspects, safeguard energy security, address climate change, protect the ecology and environment, promote sustainable development and bring more benefits to people around the world."

— Xi Jinping

Extracted from: The Congratulatory Letter to the Opening Ceremony of Taiyuan Low Carbon Energy Development Forum 2019

### Assuming Responsibility as an Energy Pioneer

**Guarantee stable power supply:** Yunnan Huangdeng Hydropower Station was awarded the "International Milestone Project Award on RCC Dams" at the 4th International Symposium on Roller Compacted Concrete Dams and the "First Prize for Science and Technology Progress of the Chinese National Committee on Large Dams".

**Deepen scientific and technological innovation:** The Company has established a new energy technology R&D center, an offshore wind power technology R&D center and a coal technology research center, providing technical support for the "Two Lines" and "Two Integrations" development strategy.

**Strictly implement the human-oriented safety concept:** The Company has fully promoted the construction of a work safety management platform, and established a group-level maintenance center and 4 regional sub-centers, and the overall excellence rate of units after overhaul increased by 3 percentage points.

**Enhance ecological development:** On September 29, 2019, the 300MW offshore wind farm of Huaneng Dafeng Wind Power Project Phase I, the farthest offshore wind farm in China, was officially put into operation.





# Guarantee Stable Power Supply



## International Guidelines



## Huaneng's Action



Domestic power generated

# 705,700

GWh

up

# 0.44

% year-on-year



Heat supplied

# 228

million GJ

up

# 6.54

% year-on-year



## Call of the Party

"Doing business and operating an enterprise is more than making money. Those who engage themselves in real economy should concentrate on their main business earnestly and steadily, and this is what they should do."

— Xi Jinping

The Company has always adhered to its essential duty to guarantee electric power supply. In particular, in the key period when important events in the country took place or in the period when severe weather featuring bitter cold or torrid heat hit, all industrial sectors of the company cooperated with concerted efforts and all staff members rose to the challenges to ensure the safe, stable and clean electricity and heat supply to the masses. In 2019, the Company's domestic power generation reached 705,700 GWh, up 0.44% year-on-year; and the heat supply reached 228 million GJ, up 6.54% year-on-year.

Attaching great importance to the construction quality of electric power projects, the Company has strictly implemented the high-quality policy, and strengthened the delicacy management of construction process to keep quality under control and build projects of excellent quality. In 2019, the Company's Quality Supervision Station completed the quality supervision and inspection of 223 stages for 86 projects, with 13,658 quality issues discovered and corrected.

- ◎ Yunnan Xiaowan Hydropower Station won the Jeme Tien-yow Civil Engineering Prize
- ◎ Zhejiang Yuhuan Power Plant Phase I was listed among the "100 Classic & Excellent Projects" at the 70th Anniversary of the Founding of the People's Republic of China
- ◎ Yunnan Huangdeng Hydropower Station was awarded the "International Milestone Project Award on RCC Dams" at the 4th International Symposium on Roller Compacted Concrete Dams and the "First Prize for Science and Technology Progress of the Chinese National Committee on Large Dams"
- ◎ The Luntai CHP project and the Hami Wind Power Base Phase II Santanghu Wind Farm Area C Project in Xinjiang were awarded the Quality Power Project of China

## Case: Guarantee electric power supply against typhoon

In August 2019 when typhoon "Lekima" landed, the Company immediately issued Level 1 early warning against typhoon hazard. All subsidiary power plants carried out inspection and rectification in strict accordance with the plan for typhoon prevention and flood prevention, and organized comprehensive investigation into the main power houses, power distribution rooms, coal terminals, and other critical production areas as well as major equipment, so that the hidden dangers were rectified and eliminated in time; materials were laid up in advance to ensure sufficient storage of coal yards for unit operation in case of typhoon or flood.

Nearly 800 employees of Zhejiang Branch were engaged in the duty system for typhoon prevention, with specific personnel assigned to each post to ensure 24h duty system, and situations on the field were tracked in real time for information release. During the impact of typhoon Lekima, all plant personnel and equipment stayed safe and sound, with units kept in safe and stable operation; the Zhe'nan Wind Farm achieved a single-day power generation of 1,650 MWh and utilization time of 22.16 h, the record high since its operation.

## Case: All out to guarantee the safe electric power supply to Beijing during the 70th National Day celebration

Inner Mongolia Shangdu Power Plant served as the main power plant that guaranteed the safe electric power supply to Beijing, the capital of China. During the 70th National Day celebration period, it set up a power supply guarantee leading group, which formulated power supply guarantee plan to break down the work into several aspects, e.g. organizational guarantee, work safety, equipment management, environmental protection and coal reserve, so as to fulfill the corresponding responsibilities level by level for more effective implementation. From September 21 to October 8, 2019, Shangdu Power Plant successfully completed its task with a total of 673 GWh of electricity safely supplied to Beijing.



Inner Mongolia Shangdu Power Plant guaranteed safe electric power supply to Beijing during the 70th National Day celebration



# Deepen Scientific and Technological Innovation



## Call of the Party

"The 18th CPC National Congress proposed to implement the strategy of innovation-driven development, and stressed that scientific and technological innovation provides strategic support for raising the productive forces and boosting the overall national strength, and we must give it top priority in overall national development."

— Xi Jinping

### International Guidelines



### Huaneng's Action



Investments in science and technology RMB

**5.2**

billion yuan

up

**13.5**

% year-on-year



Authorized patents

**777**

Ministerial/provincial-level scientific and technological achievement awards

**21**

## Strengthen Top-level Design

The Company strengthened the systematic planning for scientific and technological innovation, revised the "Measures for the Management of Science and Technology Projects", "Measures for Assessing Scientific and Technological Innovation Performance" and other management systems, and invested RMB 5.2 billion yuan in science and technology, up 13.5% year-on-year. In this way, the Company's scientific and technological innovation capability was guaranteed in terms of organization, system, and funds.

In 2019, Huaneng reached a record high in scientific and technological achievements, with 777 patents acquired, rate of technology transfer up to 50%, 96% of science and technology projects fulfilled, 21 ministerial/provincial-level scientific and technological achievement awards received, and 4 national science and technology programs undertaken, 2 of which won China Patent Excellence Award.

## Focus on Making Technological Breakthroughs

Centering around the "Two Lines" and "Two Integrations" strategy, the Company focused on core and key technologies in significant fields, with 36 new science and technology projects launched, 195 projects underway, and 12 key research fields identified, including intelligent coal-fired power stations, offshore wind power, coal mine safety and digitalization, as well as hydropower ecological and environmental protection.

- © "The Compilation and Application of 5 Electric Power Industrial Standards Including Technical Condition of Circulating Fluidized Bed Boiler Combustion System" won the 2nd Prize for China Electric Power Technology Progress
- © "Development and Application of Key Technology for 300MW CFB Boiler Power Generation by Direct Co-firing of Municipal Solid Waste and Biomass" won the 3rd Prize for China Electric Power Technology Progress
- © Up to 93.4% the equipment employed at the Shidao Bay HTR-PM Nuclear Power Plant Demonstration Project was manufactured domestically, far beyond the target ratio of not less than 75% set for major projects
- © Reached 22.8% in terms of the certified efficiency of perovskite solar cells, a globally leading level, and successfully developed the first domestic hectowatt-level perovskite module with power up to 115W
- © Developed the imbricated photovoltaic module with all cell strings connected in parallel, which is featured by outstanding resistance to partial shading and hot spot effect, further improving the photovoltaic power generation efficiency
- © Carried out the research on the technology of 660MW coal-fired boiler power generation by co-firing with dried municipal sludge, which was listed among the first batch of coal-biomass co-firing power generation demonstration projects in China
- © Put into operation China's first mercury removal facility integrating forced oxidation, catalytic oxidation and re-release inhibition, achieving mercury emission concentration below 1µg/m<sup>3</sup>



the rate of technology transfer

**50** %

the rate of science and technology projects fulfilled

**96** %

China Patent Excellence Award

**2**



New science and technology projects launched

**36**

Projects underway

**195**

Key research fields

**12**



## Transformation of scientific and technological achievements

The Company made preparations for setting up a technology venture capital fund, built a number of China's first-of-the-kind advanced technology application demonstration projects, facilitated the transformation of scientific and technological achievements and market promotion, and implemented demonstration projects in terms of remote and centralized control over regional clean energy sources, municipal waste pre-carbonization treatment, sludge treatment and power generation, etc. in a high-quality and efficient manner.

- ④ The "Key Technologies and Applications for Highly Flexible Operation of Coal-fired Units" won the First Prize of China Electric Power Science and Technology Progress Award. So far, the technology has been applied on more than 50 coal-fired units
- ④ The smoke plume treatment demonstration project was put into trial operation at the 660MW generating unit in Hanfeng Power Plant
- ④ The demonstration project of bypass flue gas evaporation technology for FGD wastewater at Huangtai Power Plant was successfully accepted and identified as an internationally leading technology, and has been applied in more than 10 power plants
- ④ Yueyang Power Plant completed the integrated municipal waste treatment demonstration project, and fulfilled the corresponding research and development of key technologies and equipment for sludge, wastewater and garbage disposal, receiving extensive attention from the thermal power industry
- ④ The demonstrative application of sewage sludge carbonization for power generation at Taicang Power Plant reached a production capacity of 300 t/day, being the first in China



Hanfeng Power Plant in Hebei province



Huangtai Power Plant in Shandong province



Yueyang Power Plant in Hunan province



Taicang Power Plant in Jiangsu province

## Establish Scientific Research Platform

Huaneng has established a new energy technology R&D center, an offshore wind power technology R&D center, and a coal technology research center, providing technical support for the "Two Lines" and "Two Integrations" development strategy. As of the end of 2019, the Company has established a scientific and technological R&D system mainly consisting of 7 national key laboratories (R&D centers), 2 sci-tech research bases, and several company-level laboratories.

- ④ Established a new energy technology R&D center, and recruited technical professionals; the R&D center has acquired qualification in new energy engineering consultation, and has been providing all-round technical services for the new energy industry
- ④ Set up an offshore wind power technology R&D center, took the lead in forming an industrial alliance for offshore wind power technology innovation, and offered technical services for offshore wind power projects in Jiangsu, Zhejiang, Guangdong, Shandong, Liaoning and other regions, helping some wind farms to increase generating capacity by 4.95%
- ④ Established a coal technology research center, strove to build a professional platform for coal technology R&D, completed the compilation of a mid- and long-term development plan for the entire life cycle of mines, and participated in the preparation of an innovation alliance of smart coal mine technologies



National key laboratories (R&D centers) of the Company

7

Sci-tech research bases

2

## Encourage Staff Innovation

To actively respond to the national development strategy of "Mass Entrepreneurship and Innovation", the Company promoted in-house "entrepreneurship and innovation" work, gave full play to the "Huachuang Innovation Space", and the achievements made in the "entrepreneurship and innovation" program were defined as an indicator in scientific and technological innovation assessment. The third batch of grassroots enterprise technology innovation studios, 27 in total, have been identified; 70 group-level mass innovation projects and 277 regional company-level mass innovation projects were launched. The first selection of "Huaneng Makers" and "Huaneng Craftsmen" was organized to further strengthen the cultivation and promotion of innovative talents and skilled professionals.

- ④ Organized the collection and selection of staff technological innovation achievements of year 2018, with 488 innovation results participated, among which 169 were selected and commended, and the number and quality of awarded results far exceeded the previous years
- ④ Actively recommended outstanding achievements to the China Energy and Chemical Geology Union, CEC and other industrial platforms. 61 achievements were awarded as national excellent technological innovation achievements by staff members of the energy & chemical geological sector and the national power sector



Number of grassroots enterprise technology innovation studios identified in the third batch

27

Group-level mass innovation projects

70

Regional company-level mass innovation projects launched

277





# Strictly Implement the Human-oriented Safety Concept



## Call of the Party

"We must insist on realizing, safeguarding, and developing the fundamental interests of the overwhelming majority of the people as the starting point and goal of all the work we are engaged in. Our major work and major decisions must be in line with the national conditions and down-to-earth."

— Xi Jinping

### International Guidelines



### Huaneng's Action



Proportion of female employees

**23**  
%

Proportion of female managers

**32**  
%



Thoroughly implemented the promotion mechanism for professional and technical positions;

**124**

grassroots enterprises have completed the system construction

## Diligently Promote Safe Production

### Consolidate the Foundation for Safety

Following the guideline of "Preventing risks and ensuring safety to welcome the national celebration", the Company enhanced the implementation of the whole-staff responsibility system, improved its ability to pre-control safety risks, strengthened the management of outsourcing projects, the comprehensive management of hazardous chemicals, etc., so as to effectively responds to natural disasters including typhoons and mudslides, continuously improving the the level of intrinsic safety. In 2019, no major or severer accident has occurred to the Company; tasks for guaranteeing power use in significant periods such as the National "Two Sessions", "Belt and Road" summit forum, the 70th National Day celebration, etc. have been successfully accomplished, maintaining a generally stable and safe production.

In terms of construction safety, the Company firmly upheld a people-oriented safety principle, and carried out the "Safe Production Month" campaign in accordance with the safety requirements for "Zero Hidden Danger". In accordance with the safety management concept of "operational safety = creating and maintaining safe-level operating conditions + zero human-caused errors", the Company has incorporated 52 safety management norms and 6 operational risk libraries into its construction site safety risk management and control system, and built a risk control platform comprising of 12 modules including risk management & control system, hidden danger investigation, etc. so as to form an overall linkage mechanism centering on on-site safety risk management and covering owners, supervisors, constructors and all other stakeholders.



#### Carried out accountability assessment

Completed the responsibility system inspection and evaluation of 15 subsidiaries including Luntai Thermal Power Plant and Changchun Thermal Power Plant

Completed the follow-up inspection work for two subsidiary units including Weijamao Power Plant



#### Improved safety and risk control capability

Carried out the pilot establishment of a "dual prevention" mechanism for risk classification and hidden danger management for six subsidiaries, namely Weihai Power Plant, Changchun Thermal Power, Yantai Power Plant, Yuhuan Power Plant, Jiangsu Wind Power Branch and Taicang Power Plant.

Completed the safety assessment review work for Hegang Power Plant, Shangdu Power Plant and Xining Power Station

Strictly applied "two permits, three systems" management, with close attention paid to the safety management of high-risk operations such as electrical operations and high-altitude operations and equipment commissioning



#### Strengthened the management of hazardous chemicals

Standardized the management of hazardous chemicals storage, use, emergency response and training, and conducted compliance inspections on the planning and arrangement of major hazardous sources in the plant area

Carried out special inspections for the management, maintenance and operation of natural gas pipelines within the boundaries of gas-fired power plants

Conducted special safety inspections on Tianjin IGCC Power Plant, Huating Methanol Company, and Huating Polypropylene Plant Project



#### Enhanced safety management on outsourcing projects

Strengthened the management of project managers, technical leaders, safety management personnel and operators of special work, and strictly controlled the turnover rate of outsourced workers

Adequately fulfilled the duties as a professional supervisor by requiring the number and qualifications of on-site supervision personnel to meet the contract terms

Reasonably arranged the timelines for unit maintenance and technical renovations, and severely punished violations with "zero tolerance"

Paid close attention to the risk management and control of key processes, and carried out special inspections on the sites of high-risk technical retrofit projects such as coal yard enclosure



## Alarm Bells Ringing

### Course of accident:

On August 16, 2019, worker He from an outsourcing company fell into the feeding inlet of a 30.5m cyclone of Boiler 3# at East Hailar Power Station and then into the return feeder, and eventually died after rescue. A subsequent autopsy showed that an acute attack of coronary heart disease caused the falling from height, which caused brain injury and death.

### Cause:

The local public security organ determined this was a fortuitous accident.

### Handling:

Although the incident did not constitute a production safety accident in general, it disclosed certain problems in the safety management of East Hailar Power Station. The Company decided to hold the management team accountable for the incident and impose qualitative punishment in accordance with the "Reward and Punishment Measures for Electric Power Production Safety".

⊙ The then President and 2 Vice Presidents of Huaneng Hulunbuir Company were criticized in a circulated notice, with a financial penalty at 1% of their annual salary, and other members of the leadership team were imposed a financial penalty at 0.5% of their annual salary;

⊙ A financial penalty at 0.2% of the total wages was imposed on the headquarters of Huaneng Hulunbuir Company, and penalty of 1% of the total wages was imposed on East Hailar Power Station.

### Lessons learned:

⊙ Strengthen the safety management of contracted projects, earnestly perform the main supervision responsibility, and reinforce the work liaison and on-site supervision after "eight working hours";

⊙ Strictly apply the production safety responsibility system on the whole staff, implement inventory management, unify the implementation of responsibilities and accountability, and promote the implementation of the responsibility system with effective accountability;

⊙ Strictly enforce the "two permits" management system, strengthen hazard analysis, fully identify field operation risks, and improve risk pre-control measures;

⊙ Strengthen anti-violation management, and investigate and deal with the violations through corresponding measures including self-inspection and self-correction, on-site inspection, warning & exposure, severe punishment, and joint accountability.

## Improve Equipment Safety

With great attention paid to equipment safety management, the Company completed the rating of 318 coal-fired power generating units with an industry-leading equipment reliability and thermal power efficiency. In 2019, the Company had no equipment assessment or statistics accidents. There were 12 cases of Category 1 power equipment failure, 5 cases less than the same period last year; 112 unplanned outages occurred to (hydro & thermal power) generating units, a year-on-year decrease of 29%; no unplanned outage has occurred to any of the 73 power plants; the Company's (hydro & thermal power) equivalent availability factor was 93.79%, down by 0.08% year-on-year. In the National Power Reliability Indexes 2018 jointly issued by the National Energy Administration and the China Electricity Council, 14 coal-fired units of Huaneng were listed among those with satisfying operation indicators, an increase of 7 units over the same period last year, accounting for 28% of the total amount awarded, with an increase of 15% year-on-year, and ranking the first among all power generation companies.

	EAF	YoY increase	Unplanned outage rate	YoY decrease
Wind power	99.23%	0.43%	0.27%	0.37%
PV	99.49%	0.76%	0.10%	0.12%

The Company comprehensively promoted the construction of a production safety management platform, established a group-level maintenance center and 4 regional sub-centers, carried out 73 unit-times of independent unit-level maintenance, continued to promote standardized maintenance management, and strengthened supervision on the entire process of standardized management of overhauled units, so that the overhaul quality was effectively improved. In 2019, the overall excellence rate of units after overhaul increased by 3% to 73.5%.



Personnel of Zhejiang Branch carries out condition-based maintenance to ensure safety

## Coal Industry Safety

By continuing to strengthen the management and control of production safety in the coal industry, the Company maintained general stability in coal production safety.

- ⊙ We earnestly promoted the standardization work for production safety, with Lingdong Coal Mine successfully passed the on-site national Level 1 standardization acceptance inspection; 13 coal mines of all the 17 productive coal mines of the Company were rated as Level 1, accounting for 76% of the total
- ⊙ Intensified on-site management and rectification of hidden dangers, and carried out 4 quarterly production safety inspections and special work safety inspections for "Preventing risks and ensuring safety to welcome the national celebration" throughout the year; sorted out the hidden dangers identified and further promoted the accountability for problem rectification
- ⊙ Vigorously carried out coal chemical safety management, thoroughly applied the announcement system for safety risk assessment and commitment of hazardous chemical companies, implemented the accountability system of major hazard sources, further improved the leakage management system, and established a normalized leakage management mechanism

## Nuclear Power Sector Safety

The Company fully implemented the whole-staff production safety responsibility system and continued to consolidate the safety foundation of nuclear power. Continued to improve the "dual prevention" mechanism for risk classification and hidden danger management, identified major hazards for focused management and control. Actively carried out quality assurance supervision and inspection campaigns to effectively lift the operating efficiency of the quality assurance system.

The Company has set up and improved a nuclear emergency response team to provide organizational support to ensure the effective operation of the nuclear emergency system; we also issued and implemented 7 nuclear emergency systems to provide institutional support for the effective functioning of the system. In accordance with the principle of active compatibility, a nuclear emergency command center was built, further strengthening the guaranteeing facilities. The nuclear emergency plan of Shidao Bay HTGR Plant Nuclear Power Demonstration Project in Shandong Province has passed the review by the National Nuclear Safety Administration, with construction of all related facilities basically completed, training and drills being carried out in an orderly manner, further enhancing our nuclear emergency capability.



## Cultivate Safety Awareness

The Company actively enhanced its emergency response capability and safety education and training. By formulating safety emergency plans, organizing emergency drills, conducting safety training, etc. we have improved the emergency response ability and safety awareness of our employees and outsourced workers. In 2019, the Company organized a number of emergency drills, such as plant flooding drill at Jinghong Hydropower Station and natural gas pipeline deflagration drill at Suzhou Thermal Power Plant; held work safety training sessions on "Interpretation of Inspection and Evaluation Standards for the Whole-Staff Work Safety Responsibility System" and "Key Points for Safety Management of Lifting Equipment", etc.

"Safety in production is a major issue related to the lives and properties of the people, an important indicator of the coordinated and sound development of the economy and society; it is also the Company's primary responsibility, task, and benefit."

—Shu Yinbiao,  
Secretary of Party  
Leading Group and  
Chairman of Huaneng

### Case: Intensify the work safety education and training for outsourced employees

The safety awareness in outsourced employees should be enhanced as an essential basis for ensuring the company's production safety and physical safety of employees. Luoyuan Power Plant clearly stated in the bidding documents the requirement that "newly enrolled employees from outsourcing companies shall receive 5-day safety training", and that they shall pass the subsequent examination before taking up the post. The power station made detailed training courses, which covered case analysis, fire safety system, reward and punishment system publicizing and implementation, etc., with the aim to effectively raise the safety awareness and quality capabilities of outsourced

employees, and transform the employees' safety concept from "Want me to be safe" to "I want to be safe".



Safety training of outsourced staff at Luoyuan Power Plant

### Case: Carry out emergency drill for flood control in high water season and geological disasters

In May 2019, Yingliangbao Hydropower Station carried out an emergency drills for flood control in high water season and geological disasters, simulating heavy rains and small debris flows in the traffic tunnel area of the plant, with Level 4 flood control response and Level 3 engineering geological disaster response launched. The participants conducted the exercises on information transmission, engineering rescue, personnel rescue, power restoration, etc. in order. The drill effectively exercised the capability for coordinated combat of emergency command institutions at all levels, and employees' awareness of safety and prevention was significantly improved.



Safety emergency drill at Yingliangbao Hydropower Station

## Thoroughly implement employee responsibilities

### Protection of basic rights

The company strictly abides by the *Labor Law*, *Labor Contract Law* and other laws and regulations, pays social insurance in strict accordance with relevant regulations, protects the personal privacy of employees, and constantly improves the basic management of labor and employment. By the end of 2019, there were 131,579 employees in the Company, 100% of which having signed labor contracts with the Company. The total labor productivity was RMB 834,000 yuan/person, and the employee turnover rate was 1.37%.

  
Improve Remuneration  
and Benefits

Continuously improved the remuneration management methods, strengthened the classification management of total wages, actively promoted the salary system reform; paid wages in a timely manner, increased income reasonably; improved the enterprise annuity management system; further strengthened and standardized the employee welfare guarantee system; adhered to equal pay for equal work; gave favorable payment to the front-line employees and production teams; social insurance coverage reached 100%.

  
Deepen Democratic  
Management

Improved the democratic management system with the Workers' Congress as the basic form, and continuously increased the transparency in factory affairs. In 2019, 45 subsidiaries of the Company carried out democratic appraisal by the Workers' Congress, with a substantially wider coverage, higher standardization and quality level than the previous years. The ratio of Workers' Congress establishment, transparency in factory affairs and "List of Factory Affair Transparency Items" in the subsidiaries reached 95.8%, 95.8% and 93.8% respectively. One proposal was titled as a National Excellent Worker Representative Proposal.

  
Build the  
"Home for Staff"

Intensified the construction of Home for Staff and improved the quality of grassroots labor union; the electronic bookstore for employees was officially launched to provide online reading services for all the staff members of Huaneng; 95.8% of the secondary subsidiaries and 92.4% of the grassroots enterprises have set up labor union, and 95.8% and 80.1% have set up labor union offices.

  
Care for Physical and  
Mental Health

Organized regular medical examination and special examinations for employees on special type of posts, with all staff members being examined with health files created; successively arranged more than 10 experts from Beijing Hospital and Beijing Cancer Hospital to visit Yimin Coal and Electricity Co., Ltd., and Jalainur Coal Co., Ltd. for "Sending Medicare to Grassroots Units", delivering a healthy life philosophy, scientific diagnosis and treatment services, and high-quality medical resources to the employees in remote areas.

  
Guarantee Vacation  
Rights

Depending on the years of service, employees are entitled to an average of 10 days of paid leave; the provisions for maternity and lactation leave for female workers were strictly implemented.

  
Ensure Employment  
Equality

Adhered to the employment policy of equality between different genders and among different ethnic groups, with a male-female ratio being 3.31; protected the legitimate rights and interests of female workers and dispatched labors; improved the quality of graduate recruitment work, and clarified the conditions and procedures for recruiting retired soldiers.

  
Show Consideration for  
Special Talents

Accelerated the training of internationalized talents, promoted the construction of the remuneration system for an international talent team, further mobilized the work enthusiasm of employees working overseas and provided all-round guarantee for them; clearly defined the standard of subsistence allowances for cadres living in villages for poverty alleviation work and included such amounts into the total wages management.

  
Care for Female  
Employees

Actively implemented the "Special Rules on the Labor Protection of Female Employees", with two "Baby Care Rooms" built in Huaneng Building and Beijing Thermal Power Plant respectively to protect the female employees' rights and interests in childbirth and breastfeeding; organized the national reading event titled "March 8th Literary Family" with the theme of "Females Blossom into Their Full Potential on the Road of Chasing Dreams in the New Era", with 83 works of Huaneng employees awarded. The Company also won the Outstanding Organization Award and the Special Organization Award, the 6th consecutive year being commended in this event.



## Facilitate Career Development

Attaching great importance to the career development of employees, the Company strengthens the training of international and technical professionals, continuously improves career development access, and thoroughly implements the promotion mechanism for professional and technical positions. In 2019, 124 grass-roots enterprises have completed system construction, and 65 have carried out recruitment for technical skill positions.

- Strengthened the construction of a team of international talents, launched a new round of selection of international talents, and established a rich, professional international talent pool with about 1,200 talents
- Promoted the training of technical talents, carried out the employment-term assessment and evaluation of 11 chief experts and 16 chief technicians, and arranged for 140 batches of skill level certification work for 56 professions

The Company continued to carry out labor skill competitions, studied skill competition programs and plans, and held more competition of wind power operation and maintenance skills as well as hydropower operation watcher skills, and further intensified the training and selection of talents.

- Ran competitions among thermal power stations on 300MW-and-above units, appraised and commended the top 10 stations in terms of comprehensive capability, top 10 stations in terms of unit indexes, and the 5 stations that have made the greatest progress
- Actively participated in "ARC Cup International Welding Competition", Young Internal Trainer Skill Competition, Fuel Sampling and Testing Skill Competition, National Nuclear Pump Maintenance Skills Competition, etc. to create conditions for skilled talents to stand out
- Successfully held the "Sunshine Cup" photovoltaic skill competition of Gansu, Qinghai and Ningxia, and the Gas Turbine Skill Competition of Jiangsu, Zhejiang and Shanghai

### Case: Hold the 2019 Skill Competition of Central Control Watchers for Supercritical Coal-fired Generation Units

In October 2019, the Company held a Skill Competition of Central Control Watchers for Supercritical Coal-fired Generation Units of 2019 at Shantou Power Plant, with a total of 66 contestants from 26 regional companies. After 4 days of fierce competition, 9 contestants won the title of "Company Technical Experts". During the competition, the Company also carried out technical exchange symposium, with a total of 45 technical documents solicited, of which 5 excellent papers were exchanged via speeches at the meeting, effectively stimulating the employees' enthusiasm to learn skills.



Skill Competition of Central Control Watchers for Supercritical Coal-fired Generation Units

The Company attaches importance to selecting, promoting and commending models of all kinds, gives play to the demonstration, leading and driving role of model workers and highly skilled talents, and created a strong atmosphere for learning skills throughout the Company.

- The 3rd thermal control team of the Maintenance and Overhaul Department in Yueyang Power Plant and Baiyanghe Wind Farm won the honorary title of "National Pioneer Worker"
- Wang Jianhong, Deputy Director of the continuous maintenance workshop at the open-cut mine of Yimin Coal and Electricity Co., Ltd., won the "May 1st Labor Medal"

- Wang Jian from Shanghai Electric Power Maintenance Company and Cheng Ping from Dezhou Power Plant were selected for the "100 Outstanding Craftsmen Training & Support Program for Central SOEs"
- Five subsidiaries including Huaneng Tianjin IGCC Co., Ltd. won the honorary title of "Advanced Group of Central SOEs"
- 13 employees including Jin Jiancheng from Huating Coal Industry Group Co., Ltd. won the title of "Model Workers of Central SOEs"

## Caring for Employees in Difficulty

Guided by the concept of "serving the people and solving problems for them", the Company serves the employees wholeheartedly. We visited 7 secondary companies including the Huaneng Coal Industry Company and Shandong Branch for survey, and went into the homes of 16 needy employees for face-to-face discussions and exchanges, so as to lay a solid foundation for providing subsequent targeted assistance and daily assistance for the needy employees. In 2019, the Company gave out the funds in time, assisted 8577 employees in difficulties and distributed funds of RMB 31.38 million yuan; among which all subsidiaries helped a total of 7677 employees in need, visited and gave condolence to 3609 employees in difficulties, and distributed relief funds and materials worth RMB 19.68 million yuan.

## Enrich Life in Spare Time

The Company organized various types of leisure activities such as sports, literature and art, and reading to further enhance the patriotic enthusiasm of employees, enrich their cultural life, fully showcase their talents, and increase the corporate cohesiveness. In 2019, 1,140 cultural and sports associations have been set up throughout the Company, with 3,754 cultural and sports events organized, and 113,900 employee-times involved.

- Organized fun sports games and walking activities for employees in units and subsidiaries in Beijing, with nearly 1,000 employees participating in them
- Held employee photography exhibition with the theme of "Sing for the Motherland - Love for Huaneng" to celebrate the 70th National Day
- Carried out "My Motherland and Me" recitation event and reading campaign "Reading in Huaneng"
- Sent teams to participate in the tennis, bridge, and table tennis competitions of the national electric power industry and achieved excellent results
- 22 pieces of employee works won the "Micro-Film and Micro-Video Award" by China Energy, Chemistry and Geology Union, and 6 pieces were selected into the China Electric Power 70 People Photography Exhibition



"My Motherland and Me" series of activities held by Hanfeng Power Plant in Hebei to celebrate the 70th National Day



Number of assisted employees in difficulties

8,577

Amount distributed for assistance: RMB

31.38

million yuan



Cultural and sports associations set up

1,140

Cultural and sports events organized

2,934

Employee-times involved

113,900



# Enhance Ecological Development



## Call of the Party

"We must protect the ecological environment just like we do with our own eyes, we must treat the ecological environment like we do with our own lives; let's build the foundation of ecological protection together, and take the road of green development together."

— Xi Jinping

### International Guidelines



### Huaneng's Action



Installed capacity of low-carbon clean energy:

**61.63**  
GW

accounting for

**33.72**  
%



Carbon emission intensity of power supply:

**640**  
g CO<sub>2</sub>/kWh

a decrease of

**75**

g CO<sub>2</sub>/kWh compared with 2015

## Strengthen Environmental Management

The Company has always been problem-oriented to diligently solve the difficulties and key issues in the current environmental protection work, made every effort to promote ecological development and pollution prevention and control, earnestly carried out risk investigation in environmental protection, and further improved the accuracy of working measures, with environmental protection achievements constantly emerging, and environmental protection indicators continuing to be industry-leading.

The Company improved the environmental protection standard system, and successively issued the "Guiding Opinions on the Water Saving and Comprehensive Treatment of Wastewater in Thermal Power Plants", "Guiding Opinions on the Technical Routes for Ultra-low Emissions from Small- and Medium-sized Units and Heating Boilers of Thermal Power Plants" and other documents, providing clear policy guidelines for the environmental retrofit and environmental protection technology innovation in grassroots enterprises.

The Company continued to reinforce the construction of the environmental protection early warning and emergency response mechanism, and the relevant disposal regulations for environmental protection early warning and emergency response were incorporated into the "Comprehensive Emergency Plan for Major Emergencies"; all subordinate units conducted regular drills to minimize the risks that may be caused by environmental emergencies.

## Adjust Energy Structure

The Company is committed to building a clean, low-carbon, safe and efficient energy system, and promoting the "Two Lines" and "Two Integrations" development strategy. On the north line, Phase 1 of the Ximeng Wind Power Base has been fully launched; on the east line, 1000 MW of offshore wind power capacity has been increased in the Jiangsu area throughout the year, laying a solid foundation for the Company to build a 10GW-level offshore wind power base on the eastern coast.

In 2019, the Company's total installed capacity was 182.78 GW, of which 61.63 GW was low-carbon clean energy installed capacity, accounting for 33.72% with a YoY increase of 0.54%; non-hydro renewable energy installed capacity was 23.96 GW, accounting for 13.1% with a YoY increase of 1.2%.

In 2019 the Company has made major breakthroughs in renewable energy construction. The number of approved projects, newly-added capacity and the scale of projects commencing construction achieved record high.

- Approved renewable energy projects reached 8,280MW, 2.8 times that of the previous year; it exceeded the annual target and ranked top in the domestic power generation industry
- Newly added renewable installed capacity was 5,020MW, 4 times that of the previous year
- Renewable energy projects commencing construction came to 8,040MW, 5.4 times that of the previous year



Total installed capacity

**182.78**  
GW

Non-hydro renewable energy installed capacity was

**23.96**  
GW

Renewable energy projects approved reached

**8,280**  
MW







### Wind power

In 2019, the Company's approved wind power projects reached 4,770 MW, newly-added installed capacity was 3960 MW, and 6,390 MW commenced construction.

- ① 800MW installed capacity was increased at the Jiangsu offshore wind power base, with 1,450MW being approved
- ① The 500MW low-speed wind farm as Phase I of Puyang Project with the largest single plant capacity in China was connected to the grid
- ① The No.4 offshore wind power project in the South of Shandong Peninsula was approved



### PV

In 2019, the Company's approved photovoltaic projects reached 3,500MW, newly-added installed capacity was 1,059MW, and 1,550MW commenced construction.

- ① The Zaoyang Photovoltaic Power Station Project under construction is expected to effectively improve the grid structure and ease the local power supply pressure
- ① The Xintai agricultural-photovoltaic hybrid power project under construction is also expected to optimize the power supply structure and effectively promote the local agricultural development



### Hydropower

In 2019, the Company has put 882.5MW hydropower projects into production, with power generation exceeding 100,000GWh.

- ① Cascade hydropower projects such as Wulonglong and Lidi Hydropower Stations with outbound transmission through UHV were put into operation
- ① Construction of Toba and Yingliangbao hydropower stations started construction
- ① The continued construction of Jiacha Hydropower Station and Yamansu Hydropower Station was further advanced



### Biomass

- ① The investment decision of Jilin Nong'an and Shandong Sishui Biomass Projects were made
- ① The Jiyang Biomass Project went through procedures to commence construction

The Company deployed the key strategy "Accelerating Breakthroughs in Nuclear Power Development", established three major systems including nuclear power safety, quality assurance, and nuclear emergency management, and made every effort to advance the four key tasks of the year including the construction of demonstration projects, and nuclear power project development, with several "firsts" created in the history of Huaneng's nuclear power industry. In 2019, the Company was granted a nuclear material license, with the maintenance program, commissioning program, and commissioning quality assurance program recognized by the National Nuclear Safety Administration.



### Nuclear Power

- ① The Shidao Bay HTGR demonstration project entered the peak period of installation and commissioning
- ① The power supply project of the Xiapu nuclear power project realized power supply 66 days in advance of the targeted date
- ① Phase 2 of Changjiang project was a major breakthrough in the Company's stockholding in large-scale PWRs



### Gas Power

- ① Yangpu gas-fired combined heat and power project in Hainan completed registration and investment decision-making
- ① Three projects in Nantong and Suzhou in Jiangsu Province and Xixiu in Guizhou Province respectively were enlisted in the first batch of national gas turbine innovation development demonstration projects
- ① The continued construction of gas-fired thermal power project in Dongguan and gas-fired thermal power project in Jiangyin were carried forward in an orderly manner



### Clean Coal Power

- ① Successfully listed among the second batch of coal and electricity joint production projects of the National Energy Administration, promoting industrial optimization and upgrading
- ① The equal-capacity replacement project of Shanghai Shidongkou 1st Power Plant was approved and investment decision-making completed
- ① Daba Power Plant and Helin Power Plant were included in the national coal power COD list of 2019



Jinfeng Mountain Wind Farm in Chongqing



Hainan Dongfang Power Plant



Huangdeng Hydropower Station in Yunnan



Sanhui Lake Water-Surface Photovoltaic Power Station in Hunan



## Carry out Clean Production

### Save Resources and Energy

The Company carried out in-depth works of energy saving and consumption reduction, with close attention paid to the implementation of creating excellence in energy consumption indicator targets. Held a new round of "Energy-efficient and Environmentally-friendly Enterprise" review and acceptance, and reinforced the governance of minor indicators to meet all relevant standards. Carried out research and application of new energy-saving technologies, strengthened equipment management, optimized the integrated application system of energy-saving and consumption-reducing technologies with Huaneng's independent intellectual property rights, and concentrated superior resources to build energy efficiency benchmark units.

In 2019, the Company's coal consumption for power supply was 297.55g/kWh, a year-on-year decrease of 1.17g/kWh; the auxiliary power ratio was 3.78%, a year-on-year decrease of 0.19%.

### Energy Efficiency Benchmarking of Central Enterprises in the Power Industry by SASAC

- ⊙ A total of 7 units won the title "Unit of Best Coal Consumption for Power Supply" of the corresponding benchmarking model: Laiwu 7#, Weihai 6#, Rizhao 3#, Weijiamao 1#, Shangdu 2#, Ruijin 1#, and Fuzhou 4#
- ⊙ A total of 7 units won the title "Unit of Best Auxiliary Power Ratio" of the corresponding benchmarking model: Nantong Phase III 1#, Weihai 6#, Weijiamao 1#, Tongchuan 2#, Ruijin 2#, Nantong 2# and Shantou 1#. The number of awards received was leading in the industry

### National Benchmarking Competition of Thermal Power Units' Energy Efficiency Level held by CEC

- ⊙ A total of 80 units were awarded, an increase of 11 units year-on-year, and the number of awards received was leading in the industry
- ⊙ 15 units including Laiwu 7#, Anyuan 2# and Changxing 2# were rated as 5A-class excellent units, accounting for 27.27% of the total awards in this category
- ⊙ 9 units, including Weihai 6# and Rizhao 3#, won the title "Units of Best Coal Consumption for Power Supply", accounting for 42.86% of the total awards in this category
- ⊙ 9 units, including Haimen 4# and Rizhao 4#, won the title "Units of Best Auxiliary Power Ratio", accounting for 40.91% of the total awards in this category

### Benchmarking of Wind Power and Photovoltaic Indicators in 2019

- ⊙ A total of 37 wind farms were awarded, among which 8 were rated as 5A-class, 12 as 4A-class, and 17 as 3A-class, with a total capacity of 2323.5MW
- ⊙ A total of 17 photovoltaic power stations were awarded, among which 6 were rated as 5A-class, 6 as 4A-class, and 5 as 3A-class, with a total capacity of 485.9MW



Coal consumption for power supply was

**297.55**

g/kWh

with a year-on-year decrease of

**1.17**

g/kWh



Auxiliary power ratio:

**3.78**

%

year-on-year decrease:

**0.19**

%

## Reduce Emission of "three wastes (waste gas, waste water, and waste slags)"

The Company further promoted pollution prevention and control, and successfully accomplished tasks of assuring air quality in important time periods including the national "Two Sessions", the 70th National Day celebration, the 2nd "Belt and Road" summit forum, the 2nd Shanghai CIE, etc. with leading quality of environmental protection work and relevant indicators in the industry.

Accelerated the progress of environmental-protection renovation projects, strictly controlled industrial waste gas emissions, and organized the demonstrative renovation projects of integrated ultra-low emission for in-furnace low-nitrogen desulfurization and dust removal of Manzhouli 5# and East Hailar 5# units. In 2019, a total of 289 coal-fired generating units accomplished ultra-low emission, accounting for 96% of the total coal-fired units, a completion rate at 110.5% of the national retrofitting target for the 13th Five-Year Plan period. The emission performance of sulfur dioxide, nitrogen oxides, and smoke and dust from thermal power units were 0.072g/kWh, 0.141g/kWh and 0.011g/kWh respectively, basically keeping unchanged year-on-year, with a compliance rate exceeding 99.8%.

Carried out systemic management, control and treatment of industrial waste water and solid wastes. Completed 90% of the waste water treatment for power plants in key areas such as the Beijing-Tianjin-Hebei region, Yangtze River Delta, Fenhe River-Weihe River Plain, etc.; accomplished the sci-tech demonstration of bypass flue gas evaporation of desulfurization waste water at Huangtai Power Plant; completed the main construction works of enclosed coal yard upgrading for particulate pollution reduction.

### Case: Develop Innovative Technology for Desulfurization Waste Water Treatment

Xi'an Thermal Power Research Institute (TPRI) has been actively carrying out research and development of environmental protection technologies. It made breakthrough in the current bottlenecks of the treatment of high-salt and high-polluting waste water in the power industry, and successfully developed the "bypass flue gas evaporation and drying of desulfurization waste water" technology with completely independent intellectual property rights. The technology has been applied in Huangtai Power Plant in Shandong as a demonstration project, which is the first single-unit two-tower bypass flue gas evaporation system in the world. After being put into operation, the project will realize 100% zero discharge of desulfurization waste water from the unit. Chinese Society for Electrical Engineering appraised the technology as resulting in "overall technical performance indicators up to world leading level", and it was included in the "Guideline on Available Technologies of Pollution Prevention and Control for Thermal Power Plant" by the Ministry of Ecology and Environment of PRC, providing strong technical support for the treatment of desulfurization waste water from coal-fired power plants of the power generation industry.



"Bypass Flue Gas Evaporation and Drying of Desulfurization Waste Water" demonstration project of Huangtai Power Plant

### Case: Terminator of Urban Pollutants - Key Technologies for Urban Waste Drying and Carbonization Pre-treatment

To solve the treatment of urban sludge, biomass, domestic wastes and other wastes, TPRI successfully developed the key technologies for urban waste drying and carbonization pre-treatment with independent intellectual property rights and innovative technological routes. The technology was successfully put into service at Yueyang Power Plant in Hunan Province as a demonstration platform in July 2019. So far, the continuous operation tests for urban sludge, domestic wastes and in-plant FGD waste water, etc., have been completed, with the anticipated treatment capacity achieved by disposing 3-4 tons of urban sludge per hour and 1.5-2 tons of FGD waste water per hour.



The "Key Technologies for Urban Waste Drying and Carbonization Pre-treatment" Demonstration Platform of Yueyang Power Plant



## Circular Economy Construction

The Company actively carries out the construction of circular economy, and improves the utilization rate of industrial "three wastes" and waste heat and energy, so as to create a new model of harmonious environmental-economic development.

- ④ Carried out research on the digital technology for reducing circulating water effluent of Mianchi Power Plant
- ④ Bidding for Phase 2 Project of Nanjing Jiangbei WTE Power Plant and Laizhou WTE Power Generation Project

### Case: Water-saving Engineering Design of Shidao Bay Nuclear Power Co., Ltd.

To alleviate the shortage of urban water resources, Shidao Bay Nuclear Power Co., Ltd. has carried out water-saving engineering design to link the reclaimed water storage tank of the sewage station in the plant area with the reclaimed water supply pump, and laid reclaimed water reuse pipelines after the water supply pump. The post-treatment reclaimed water is directly used for green irrigation, road spraying and pond water replenishment, etc., which significantly improves the utilization rate of reclaimed water, showing substantial circular economic benefits. In 2019, the technology saved about 23,000 m<sup>3</sup> of water, equivalent to about RMB 120,000 yuan of water charges, effectively reducing the burden on urban freshwater resources.



Waste water recycling treatment and comprehensive utilization effects of Shidao Bay Nuclear Power Co., Ltd. in Shandong

## Self-initiated Contributions of Enterprise

The Company earnestly implements the national policies to cope with climate change, participates in the research and discussions of regulations including national carbon market management regulations and construction plans, organizes relevant subsidiaries to make reasonable trial calculations for allowance allocation, conducts online monitoring and research on flue gas' carbon dioxide, carried out 2018 annual accounting and verification of the historical carbon emissions of thermal power companies, and fulfilled carbon trading contracts in pilot areas such as Beijing and Tianjin; all the short-term tasks for carbon market construction have been successfully accomplished. In 2019, the Company's full-coverage carbon emission intensity for power supply was 640g CO<sub>2</sub>/kWh, a decrease of 75g CO<sub>2</sub>/kWh compared with 2015.

## Promote Environmental Awareness

### Create Green Offices

Through a series of green office measures, the Company guides the employees to start from small things to reduce energy consumption in daily life and enhance their awareness of environmental protection.

- ④ Strictly control air conditioning temperature, and promote the use of energy-saving electrical appliances
- ④ Standardize the use of company-owned vehicles, and strictly control the purchase of official vehicles and fuel consumption of vehicles
- ④ Purchase, apply for and use office supplies based on demand; replace toner cartridges when they are used up, and print on both sides of the paper
- ④ Substantially simplify meetings and briefings, comprehensively promote video conferences, and reduce energy consumption caused by business travels
- ④ Promote informatization and paperless office work, reduce paper printing by setting up a LAN for office affairs

## Ecosystem Conservation

In the construction of power stations, the Company comprehensively considers all the relevant requirements for power generation, flood control, water and soil conservation, aquaculture, tourism development, etc., implements environmental protection measures for project construction, strives to protect the surrounding environment and biodiversity, so as to achieve a harmonious unity of project development and the ecological environment. In April 2019, the Company held a special meeting to deploy the key task to accelerate the protection and restoration of the Yangtze River and ash field treatment.

### Case: Actively maintain the ecological balance of the Lancang River

To reduce the impacts of hydropower development on the aquatic organisms and fish resources of the Lancang River and maintain the ecological balance, the Company established a scientific research base for fish breeding jointly with Yunnan Academy of Fishery Sciences. A Fish lifting facility based on self research and development was applied at Wunonglong Hydropower Station to realize automatic dam-crossing of the fish during the migratory season of spring; indigenous fish breeding and releasing were carried out every year, with a total of 360,000 fish having been released till now.

Other than that, the Company also made efforts to construct green landscape for Wunonglong Hydropower Station and Lidi Hydropower Station, intensified the comprehensive treatment of "two waters and one dust", simultaneously carried out construction site afforestation and vegetation restoration; so far the afforestation and vegetation of approximately 570,000 m<sup>2</sup> has been completed,

effectively improving and protecting the surrounding ecological environment and hailed by the Yangtze River Water Conservation Bureau as a "inspection-free product".



Fish Reproduction and Release Activity of Huaneng Lancang River Hydropower Inc.

## Spread Environmental Protection Concepts

Strengthen the publicizing and implementation of environmental protection concepts, cultivate employees' awareness of ecological protection, advocate a low-carbon lifestyle, actively organize employees to participate in environmental protection public welfare actions, and actively build a communication platform for the Company's external stakeholders to better respond to their demands.

### Case: Carry out the environmental protection & public welfare event "Practicing 'Three-color Sail' and Bringing Service to the Station"

On the Day of "Learning from Lei Feng" in 2019, a tree-planting environmental-protection event, which was also an organizational activity for the Party and the Youth League, themed "Practicing 'Three-color Sail' and Bringing Service to the Station" was carried out by Changle Photovoltaic Power Station in Fujian. Volunteers worked together to carry out tree-planting activities, such as, cultivating seedlings, filling soil, cleaning, etc. The event effectively optimized the surrounding environment of the power station, and enhanced employees' awareness of environmental protection.



Tree-planting activity "Practicing 'Three-color Sail' and Bringing Service to the Station" of Changle Photovoltaic Power Station, Fujian.



# Huaneng Craftsman - Love for Mountains and Rivers

## Introduction to Academician Ma Hongqi

Ma Hongqi was elected an academician of the Chinese Academy of Engineering (CAE) in 2001. He is a technical leader in water conservancy and hydropower engineering of China, and the Chief Engineer of Huaneng Lancang River Hydropower Inc.. Ma has been in charge of and participated in the construction of more than 30 large hydropower projects including Lubuge, Guangzhou Pumped Storage, Xiaolangdi, Three Gorges, Xiaowan, Nuozhadu, etc., with outstanding contributions made to the hydropower resource development of China. Ma Hongqi has won 19 ministerial/provincial-and-above scientific and technological progress awards, including 4 second prizes for national scientific and technological progress, 1 second prize for national technological invention, Ho Leung Ho Lee Science and Technology Progress Award, Science and Technology Outstanding Contribution Award of Yunnan province, and International Lifetime Achievement Award of ICOLD. He has published more than 70 papers and 4 books. "Ma Hongqi Hydropower Technology Innovation Team" was titled as one of the first batch of outstanding technology innovation teams of central SOEs.



Academician Ma Hongqi receiving International Lifetime Achievement Award granted by ICOLD

In the late 1980s, Lancang River was listed as one of the top 12 hydropower bases. At that time, China was witnessing constant development of national economy and continuously rising comprehensive strengths, with the hydropower industry entering a period of vigorous growth. In 1999, for the coordinated development of the eastern and western regions in the country and the optimized allocation of resources, China began to implement the "West-to-East Power Transmission" program and "Western Development" strategies. The development of cascaded hydropower was launched at Lancang River, the main power source in the southern channel. In the same year, Ma Hongqi was appointed as Deputy Director of Xiaowan Project Preparatory Office, and then as Chief Engineer of Lancang River Hydropower Inc.

In Xiaowan, Ma Hongqi led the team to challenge many difficulties such as the excavation of a 700m high slope, concrete temperature control and anti-cracking of high arch dam, and seismic safety in high seismic risk zone, etc. The team solved all the problems and achieved a number of innovative results. These experiences and practices have been included in relevant revised standards and norms as reference for subsequent projects. The "World's Most Difficult" Xiaowan Project, signifying the world's breakthrough of arch dam to 300m-level, has become a milestone project which drives forward the development of global hydropower technologies.

During the ten-year construction of the Xiaowan Hydropower Station, the development of hydropower in the Lancang River Basin has been gradually launched. Ma Hongqi has also shown his outstanding talents on the stage of "Dam Expo". During the construction of the Nuozhadu core rockfill dam, which was the 3rd highest in the world among same-type dams, he successfully developed the "digital dam" system for the first time, which is a major innovation in quality control technology for dam construction in the world; during the construction of Huangdeng RCC dam which was the highest in China, he worked out the construction quality intelligent control and management information system, which was considered a new milestone of RCC dam technologies; in the process opening the dam of Jinghong Hydropower Station for navigation, he led the team to invent a hydraulic ship lift that uses hydroenergy as the power and safety guarantee, becoming the first "Made in China" hydraulic ship lift ever.

When Ma Hongqi won the Lifetime Achievement Award of ICOLD Award in 2019, he said, "the championship does not belong to any individual in the field of hydropower construction, but to all the team members. This is a glory of China's hydropower industry." The scientist who grew up in the great rivers passed his original aspirations and missions to the coming generations of hydropower practitioners.

"Mr. Ma has the wisdom needed for hydropower professionals to make good use of situations and local conditions, the brave spirit like drops of water outwearing the stone, the unrelenting courage, firm determination and passion for becoming the first-class. With these qualities he explored and perfected various underground projects and different dam construction techniques, created a variety of project management modes, explored and ameliorated the operation mode of an integrated contractual joint venture, and enriched and expanded the science-based management on construction with the project management method."

— He Huawu, Vice President of CAE and Academician of CAE



Scan the QR code to watch the documentary "Staying True to the Original Aspiration of Developing Hydropower based on Rivers" to know about Academician Ma Hongqi's story in hydropower

## Awards for Innovation Achievements Received by Ma Hongqi's Team

### ● The hydraulic ship lift key technology and its application (Second prize of National Technology Invention Award in 2018)

The technology involves a complete set of technical system integrating hydraulic ship lift theories, design, manufacturing, construction, and operation. It is a historical leap of ship lift techniques and breaks through the technical bottleneck in the principles of traditional ship lifts, providing a new, advanced, practical and safe technological choice for navigation of high dams.

### ● Key technology of ultra-high core rockfill dams and its application ( Second prize of National S&T Progress Award in 2014 )

The technology has a number of applications in innovative achievements of independent intellectual property rights in China. It has brought China's rockfill dam and dam construction technologies to a new level, and greatly promoted the development of technologies for constructing 300m ultra-high core rockfill dams in China.

### ● Key technology for real-time control of major water conservancy and hydropower projects (Second prize National S&T Progress Award in 2011)

Based on the establishment of a mathematical model for real-time control of the construction progress of high earth-rock dams, the technology proposes a method for real-time early warning and dynamic adjustment of the construction progress, providing analysis methods for real-time prediction, timely warning, dynamic adjustment and optimization of high earth-rock dam construction.

### ● Development and application of XHM-7 inclined shaft sliding mode system (Second prize of National S&T Progress Award in 2001)

It is the first XHM sliding form in China, realizing the continuous sliding of inclined shaft concrete lining for the first time, with an average sliding speed at 8m/day, filling the gap in similar technologies in China and has obtained independent intellectual property rights.



# Corporate Social Responsibility Management

## Responsibility Organization

The Company has established a Social Responsibility Management Committee. The Planning & Development Department leads and is responsible for all works related to corporate social responsibility, takes the lead in the deliberation and decision-making of major issues, forming a mechanism for organizing social responsibility management in a top-down manner with clear division of labor. A Social Responsibility Division was set up under the Planning & Development Department. In every other Headquarters department, an employee is appointed to take charge of social responsibility issues, and in each subsidiary, a social responsibility contact person was assigned, thus, a social responsibility work system has taken shape from the upper to lower levels, promoting the fulfillment of social responsibilities in the departments and subsidiaries.

## Responsibility Governance

Organizing Unit	Centralized Planning	Integration & Implementation	Main Responsibility Issues
Group Company's Board of Directors	Planning and Development Department (social responsibility, poverty alleviation, high-quality development)	Finance and Assets Management Department	Quality and Efficiency Improvement
		Enterprise Management and Legal Compliance Department	Risk Control, Corporate Governance According to Law
		Marketing Department	Fair Competition, Fair Trade
		Safety Supervision Department	Safe Production
		Production Management and Environmental Protection Department	Guaranteeing Power and Heat Supply, Energy Saving and Environmental Protection
		Technology Innovation and Digitalization Department	Sci-tech Innovation
		Materials and Procurement Management Department	Responsible Procurement, Supply Chain Management
		Renewable Energy Department (Business Unit)	Energy Structure Adjustment
		International Cooperation Department	Partnership, Belt and Road Initiative
		Organization Department of the Party Leading Group (Human Resources Department)	Employees' Career Development
		Party Building Department (Publicity Department of the Party Leading Group)	Strengthening Party Leadership
		Labor Union	Assistance for Employees in Need, Enriching Cultural Life
News and Brand Management Center	Responsibility Communication, Brand Building		

## Responsibility Concepts

<b>Mission</b>	<p>A "red" company that serves national strategy, safeguards energy security, and serves the need of socialism with Chinese characteristics</p> <p>A "green" company that facilitates energy revolution, protects the environment, and supplies clean energy to ensure a better life for the people</p> <p>A "blue" company that participates in global energy governance, serves the Belt and Road Initiative, and contributes to building a community with a shared future for mankind</p>
<b>Vision</b>	Speed up the building of a world-class energy company featuring "three colors, three strong and three excellents"
<b>Values</b>	<p>Integrity, Cooperation</p> <p>Innovation, Enterprising Spirit</p> <p>Performance-oriented, Serving the Nation</p>

## Responsibility Planning

### Social Responsibility Planning of Huaneng ( 2018-2020 )

	In-house		Outside the Company	
<b>Goals</b>	Strengthen Responsibility Management in the Group	Promote the integration of subsidiary companies' responsibilities	Build a platform for internal and external communication	Enhance the publicity of corporate responsibility image
<b>Path of Implementation</b>	<p>Improve the social responsibility regulation system</p> <p>Continuously carry out training on responsibility knowledge</p> <p>Carry out annual selection &amp; appraisal of excellent cases</p>	<p>Carry out research on the CSR performance of subsidiary companies</p> <p>Establish a social responsibility demonstration base</p> <p>Encourage the publication of social responsibility reports</p>	<p>Continue to publish social responsibility reports</p> <p>Pragmatically complete surveys on responsibility issues</p> <p>Regularly carry out CSR exchange seminars</p>	<p>Participate in external social responsibility activities</p> <p>Lead the completion of CSR communication activities</p> <p>Make the voice of CSR through the media</p>

## Responsibility Regulations

Classification	Main System
Basic Management Regulation	<i>Work Scheme for the Red Action Plan of Targeted Poverty Alleviation, Management Measures for External Donations, Management Measures for Poverty Alleviation and Aid, Management Measures for the 'Three-color Sail' Youth Volunteer Activity, Assessment and Evaluation Measures for the Party Building Work Responsibility System</i>
Regulations of Related Issues	<i>Administrative Measures for Management of Science and Technology Projects, Evaluation Standards for the Implementation of Production Safety Responsibility System, Implementation Plan for Pollution Prevention and Control (2018-2020), Opinions on Accelerating the Selection and Cultivation of Internationalized Talents, Administrative Measures for Support and Assistance for Workers in Difficulty</i>

## Responsibility Integration

### Responsibility-assuming Capability

The Company attaches great importance to the improvement of the capability to assume responsibilities. The relevant managerial personnel of the Group and subsidiary companies have been actively participating in the activities, such as "Responsible Officer Training Program" organized by the China Social Responsibility 100 Forum, to raise the social responsibility awareness of personnel in charge of social responsibility management and CSR report compilation, and increase their understanding and master of relevant theories as well as report preparation standards and methods. Within the Company, stress has been laid on the CSR report as the focal factor. Special training sessions on social responsibility have been carried out at the company headquarters for three consecutive years from 2018 to 2020, with the aim to further motivate the departments and subsidiaries to perform responsibilities and improve the quality of reports.

The Company actively participates in the research on the project of social values of Chinese and South Korean state-owned companies organized by SASAC, actively advises on the advancement of the study, undertakes research tasks of the research group, and shares Huaneng's experience in fulfilling responsibilities, so as to promote the Chinese and South Korean companies to more consciously assume social responsibilities and create more social values through the program.



"Research on Social Values of State-owned Enterprises in China and South Korea" at the Company



Special training on social responsibilities by the Company



## Responsibility Process

The Company attaches great importance to the integration of social responsibilities, encourages the subsidiaries to publish social responsibility reports, focuses on promoting listed companies to disclose social responsibility related information in strict accordance with the requirements of the stock exchanges, and actively carries out social responsibility communications. As of the end of 2019, a number of secondary companies including Huaneng Power International, Huaneng Renewables, and Huaneng Lancang River Hydropower have released CSR reports to the public.

As a major state-owned backbone energy company of China, the Company has joined the activities of a number of domestic and foreign industry organizations including the International Electrotechnical Commission (IEC), Global Energy Interconnection Development and Cooperation Organization (GEIDCO), Chinese Society for Electrical Engineering, China Electricity Council, etc. to effectively interact with the stakeholders, and actively promote the fulfillment of social responsibilities in China's power industry.

## Responsibility Performance

In order to effectively improve the integration of social responsibility into production and operation, the Company listed social responsibility management in the "Assessment and Evaluation Measures for the Party Building Work Responsibility System", and urged secondary companies to strictly carry out social responsibility work.

In 2019, the Company held the 3rd Selection & Appraisal of Excellent Cases and the 1st "Selection Event of Responsibility Performance Pictures", with cases and pictures submitted by 42 subsidiaries. Through online voting and expert scoring, ultimately the "2019 Annual Excellent Responsibility Cases and the Most Beautiful Responsibility Pictures" were selected, with the list of award winners included in the Company's sustainability report for public disclosure, so as to establish a pioneering role model, and promote the subsidiaries to better fulfill their social responsibilities.

Outside the company, Huaneng actively participated in different social responsibility-related selection & appraisal activities, with a lot of awards won for its outstanding performance in responsibility management and practices.

### China Huaneng - Responsibility Performance in 2019

- In May 2019, "Sustainability Report 2018 of China Huaneng Group Co., Ltd." was rated as five-star (the highest level) by China Corporate Social Responsibility Report Rating Expert Committee, and thus the Company became the only domestic power generation company that has obtained five-star rating for 8 consecutive years.
- In September 2019, the Company's "Targeted Poverty Alleviation for a Better Life" case won the Excellent Poverty Alleviation Case Award on the news conference of the *Blue Book of Enterprise Poverty Alleviation (2019)* and Enterprise Targeted Poverty Alleviation Summit Forum sponsored by the Social Poverty Alleviation Department under the State Council's Poverty Alleviation Office and hosted by China Social Responsibility 100 Forum.
- In September 2019, the Company's promotional film "Original Aspiration", spreading Huaneng brand image of responsibility, won the best feature film award at the "Pillar of Great Power - Towards the New Era" press conference for the series network broadcasting event of promotional videos of outstanding central SOEs images under the guidance of the Publicity Bureau of SASAC and sponsored by People's Daily Online.
- In November 2019, the Company won the title of "Top Ten State-owned Enterprises" at the "Press Conference of the 2nd Beijing Responsibility Exhibition and *Blue Book of Corporate Social Responsibilities (2019)*" held by China Social Responsibility 100 Forum. The Blue Book states that the Company's social responsibility development score was 88, ranking the 6th in the top 300 enterprises and the 4th among the top 100 state-owned enterprises, and was rated as a five-star enterprise in terms of assuming responsibility.
- In December 2019, at the "2019 China Corporate Social Responsibility Report Summit" hosted by China Social Responsibility 100 Forum, the Company won the "Responsibility Golden Bull Award — Social Responsibility Report Leader Award".
- In December 2019, the Social Poverty Alleviation Department under the State Council's Poverty Alleviation Office launched a case study of targeted poverty alleviation of enterprises. The Company's case "Do Not Forget the Original Aspiration for Wholehearted Assistance, Keep Firmly in Mind the Mission to Help Tackle the Tough Problems" passed the preliminary review, re-examination and expert review, and eventually listed among the "50 Best Cases of Targeted Poverty Alleviation of Enterprises".
- In January 2020, for the impressive performances in actively fulfilling national missions and fulfilling social responsibilities in the construction of brand internationalization, the Company won the "Voyage Award" in the "Promoting China" brand exhibition event jointly sponsored by Economic Daily, Ce.cn, and Association of China Commercial Enterprise Management.

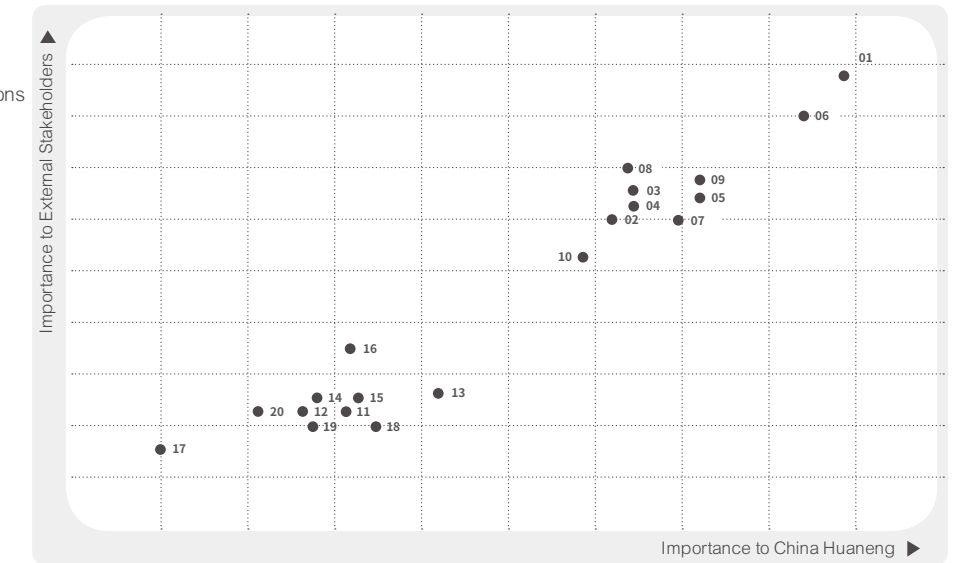
## Core Responsibility Topics

The Company actively responds to the Global Reporting Initiative Sustainability Reporting Standard, CASS4.0 of Chinese Academy of Social Sciences and other standard initiatives, conducts internal and external stakeholder surveys in conjunction with actual conditions of the industry and enterprise, clarifies the core issues of corporate social responsibility, determines the boundaries of the report, and effectively responds to the concerns of stakeholders.



Scan the QR code to learn more about "China Huaneng's Survey on Core Social Responsibility Topics 2019"

- 01 Guarantee Power Supply
- 02 Help Poverty Alleviation
- 03 Value Maintenance and Appreciation of Assets
- 04 Operation in Compliance with Laws and Regulations
- 05 Intensifying Risk Prevention and Control
- 06 Attach Importance to Safe Production
- 07 Adjust Energy Structure
- 08 Carry Out Cleaner Production
- 09 Deepen Technological Innovation
- 10 Execute Employee Responsibilities
- 11 Participate in B&R Initiative
- 12 Drive Industry Development
- 13 Optimize Industrial Layout
- 14 Expand International Market
- 15 Strengthen Procurement Management
- 16 Build a Responsible Brand
- 17 Build Cooperation Platforms
- 18 Strengthen Enterprise's Party Building
- 19 Organize Public Welfare Activities
- 20 Fulfill Responsibility Communication



## Responsibility Communication

### CSR Report

The Company has innovated communication methods, expanded communication channels, deepened communications with stakeholders, built a mechanism for social responsibility communication, and continuously improved the system of "daily, regular, and special" communication to ensure comprehensive, timely and accurate disclosure of the Company's responsibility performance to the public.

Communication Category	Communication Method
Daily Communication	Open a social responsibility column on the Company's official website Open the WeChat public account "Responsible Huaneng"
Regular Communication	Prepare annual sustainability report Participate in the report issuance conference of central SOEs organized by SASAC
Special Communication	Organize internal and external stakeholders' special social responsibility surveys in the Company Prepare special report on poverty alleviation of its enterprises Convene poverty alleviation report issuance conference



### Case: State-owned Enterprise Open Day - Visit Huaneng Jingmen Thermal Power

In July 2019, the Publicity Bureau of SASAC under the State Council and Huaneng jointly launched the "State-owned Enterprise Open Day" observation and promotion activity and the Enterprise Open Day of China Huaneng themed "Practicing 'Three-color' missions and supplying clean energy". Nearly 200 representatives of central SOEs, news media, citizens and students visited Huaneng Jingmen Thermal Power Plant to understand Huaneng's development history, experience the "Three-color" corporate culture, learn about energy and power knowledge, and witness Huaneng's dedication to clean energy.



Launching ceremony of "State-owned Enterprise Open Day"



Showcasing the image as a "responsible central SOE" in the event



Field research on "Blue Book of Social Responsibilities of Central SOEs (2019)" conducted in West Inner Mongolia Branch of Huaneng Renewables Corporation Limited



Scan the QR code to learn more about the research

"It is very fortunate to see Huaneng's wind power project deep in the grassland. I think it's appropriate to describe China Huaneng's social responsibility work with three phrases - advanced concepts, remarkable results, and worth learning. To be specific, first, China Huaneng started its social responsibility work in an early period, with a deployment system shaped, especially, the "Three-color" corporate culture impressed the society very much. Second, in recent years, Huaneng has achieved many remarkable results through continuous in-depth research and continuous strengthening of practice in the field of social responsibility. In particular, a lot of achievements have been made in its poverty alleviation work. Third, the Company's social responsibilities are closely related to its main business, setting an evergreen model for central SOEs in responsibility performance."

— Zhang Xiaosong, Head of the Social Responsibility Division, Science and Technology Innovation Bureau, State-owned Assets Supervision and Administration Commission of the State Council



The Company has consecutively published 14 sustainability reports and 2 special reports on poverty alleviation



China Huaneng's White Paper on Targeted Poverty Alleviation formally issued on the China Social Responsibility 100 Forum



Scan the QR code to view the long-picture version of China Huaneng's White Paper on Targeted Poverty Alleviation



## Stakeholder Participation

Stakeholders	Expectations for the Company	The Company's Response
Government	Respond to National Strategies	Serve National Strategies
	Operation in compliance with Laws and Regulations	Persist in Steady Operation
	Guarantee Power Security	Guarantee Power Supply
Shareholders	Value Maintenance and Appreciation of Assets	Improve Economic Efficiency
	Avoid Business Risks	Strengthen Risk Prevention & Control
	Keep Communication	Regular Communication
Employees	Improve Welfare Benefits	Protection of Basic Rights and Interests
	Guarantee Personnel Safety	Ensure Safe Production
	Employees' Career Development	Carry out Employee Training
	Work-life Balance	Caring for Employees' Lives
Customers	Guarantee Project Quality	Strengthen Quality Management
	Improve Customer Services	Improve Service Systems
	Engineering Technology Innovation	Encourage Whole-staff Innovation
Industry	Carry out Technical Exchanges	Attend Industry Conferences
	Professional Experience Sharing	Strengthen Daily Liaison
Community	Support Community Building	Help Poverty Alleviation
	Carry out Public Welfare Activities	Building Public Welfare Brand Image
Business Partners	Comply with Business Ethics	Implement Transparent Procurement
	Achieve Mutual Benefit and Win-win Result	Carry out Strategic Cooperation
NGO	Participate in Social Groups	Actively Participate in Activities
	Abide by Association Charters	Offer Advice and Suggestions

## Outlook on 2020

"The lightness of a single feather cannot make the movement of a roc; the speed of a wing-footed horse comes not from the strength of one foot." It is an arduous task and also a glorious mission to build a world-class energy enterprise featuring "three colors, three strong and three excellents". The Company shall mainly focus on the "six deepened upgrades", take the structural adjustment and "handling troubled enterprises" and "two greater breakthroughs" as the core and key tasks, and always maintain the enthusiasm and courage to be the first, as well as the spirit of reform and innovation to courageously advance towards the goal.

### As a Role Model among Chinese Companies, Huaneng Carries out Practical Actions to Help China Thrive

**Optimize the industrial layout:** deepen the integration of industry and finance, enhance the three new energy investment funds; promote the innovation of the supply chain platform, and enhance service and support to the main business

**Comprehensively upgrade the development quality:** earnestly carry out special actions to improve quality and efficiency; ensure the continuous increase of value maintenance and appreciation rate of state-owned capital; and continuously enhance the corporate vitality

**Build partnership platforms:** intensify international development, accelerate the industrial development of energy storage, and promote ultra-low emission technologies for coal-fired units to "go global"

**Create a moderately prosperous life:** intensify the implementation of the "Red Action Plan", keep aligned with the national strategies for rural revitalization, consolidate the poverty alleviation achievements in Shaanxi's Hengshan and Xinjiang's Akqi, and assist Qinghai's Jainca county to overcome poverty



### As an Energy Pioneer, Huaneng Serves the Country by Securing Power Supply

**Guarantee stable power supply:** adhere to the essential responsibility of power supply, and complete the annual plan to generate power of 735,000GWh for domestic use

**Deepen scientific and technological innovation:** adhere to the strategy of serving the country, promote innovative development, and make new breakthroughs in major special projects, smart technology and other fields

**Strictly implement the human-oriented safety concept:** take the implementation of the production safety responsibility system for all employees as the foundation, promote the modernization of safety management capabilities to ensure zero-casualty

**Enhance ecological development:** focus on the implementation of the "Two Lines and Two Integrations" strategic layout, promote structural adjustments, and ensure that the proportion of low-carbon clean energy installed capacity increases by 3.6% year-on-year











## Appendix



### Selected outstanding corporate responsibility cases in 2019

In January 2020, the Company launched the 3rd Selection and Appraisal of Excellent Responsibility Cases. A total of 42 secondary companies actively participated in the event, with 84 cases submitted, involving multiple social responsibility issues such as stable development, power supply, environmental protection, safe production, Belt and Road Initiative, and targeted poverty alleviation etc.. After the initial review and two rounds of expert scoring, 15 outstanding cases reached the final. In the final session, the Company made the "Social Responsibility Survey of China Huaneng 2020" open to the public. After a week of fierce competition, the results were finally obtained via voting.



Scan the QR code to view more information about the 3rd Responsibility Case Selection and Appraisal Event of China Huaneng

Ranking	Case	Submitted by	Case pictures	QR code link for the full text of the case
1	Safe production is of heavier weight than Mount Tai	Huaneng Renewables Corporation Limited	 220kV Grid Connection Project of Fuxin 500kV substation	
2	Technology escorts green water and lush mountains	Xi'an Thermal Power Research Institute Co., Ltd.	 The successful test on the first unit applying the heat supply technology with steam to low-pressure cylinder cut off	
3	Upgrading the safety of smart shipping via three independently developed systems	China Huaneng Group Fuel Co., Ltd.	 3D virtual real-image driving simulation system	

Ranking	Case	Submitted by	Case pictures
4	Break through adversity for rebirth	Huaneng Shaanxi Power Generation Co., Ltd.	 A panorama view of Qinling Power Plant
5	A good secretary coming to our village	Huaneng Nuclear Power Development Co., Ltd.	 "Lighting Up Dreams with Reading" Book Donation Activity

Ranking	Case	Submitted by
6	Love — Sending the "Three-color Sail" to voyage	China Huaneng Group Co., Ltd. Northeast Branch
7	Implement the "East Line" strategy and accelerate the environmentally-friendly transition of the energy structure	Huaneng Jiangsu Energy Development Co., Ltd.
8	Fulfilling social responsibilities and building livelihood projects, Huaneng's "three-color" flag of enterprise culture flying high at the border of Tibet	Huaneng Tibet Hydropower Development Investment Co., Ltd.
9	Take multiple measures and resolutely win the fight against poverty	China Huaneng Group Co., Ltd. Central China Branch
10	Giving play to the leading role of grassroots Party building, helping poverty alleviation with characteristic industries	Huaneng Xinjiang Energy Development Co., Ltd.
11	Demonstration and application of pre-drying and carbonization treatment technology for urban wastes	China Huaneng Group Co., Ltd. Hunan Branch
12	Overcoming difficulties to make a breakthrough in achieving an annual electricity generation of 100,000GWh	Huaneng Lancang River Hydropower Inc.
13	Tackling difficulties, and taking responsibility to build first-class projects	China Huaneng Group Co., Ltd. Heilongjiang Branch
14	Assistance for poverty alleviation and head towards well-off life	China Huaneng Group Co., Ltd. Zhejiang Branch
15	Highlights in the energy saving, and quality and efficiency improvement work of Luoyuan Power Plant	China Huaneng Group Co., Ltd. Fujian Branch



## Excellent works selected in the appraisal of the Company's most beautiful responsibility pictures in 2019

In January 2020, the Company launched the first selection and appraisal of the most beautiful responsibility pictures. After the initial review and two rounds of expert scoring, 15 outstanding cases reached the final. In the final session, the Company launched the "Social Responsibility Survey of China Huaneng 2020" open to the public. After a week of fierce competition, the results were finally obtained via voting.



Scan the QR code to view more information about the first Picture Selection and Appraisal Event of China Huaneng

- 1.Huaneng Shaanxi Power Generation Co., Ltd. - a bright pearl at the foot of Huashan Mountain (panoramic view of Qinling Power Plant)
- 2.Huaneng Renewables Corporation Limited - Fuxin Wind Farm
- 3.China Huaneng Group Co., Ltd. Shandong Branch - Laiwu Power Plant
- 4.China Huaneng Group Co., Ltd. Hainan Branch - Dongfang Power Plant
- 5.Huaneng Jiangsu Energy Development Co., Ltd.
- 6.China Huaneng Group Fuel Co., Ltd. - an aerial view of Huaneng Caofeidian Port
- 7.China Huaneng Group Co., Ltd. Hunan Branch - a panorama view of Sanhui Lake
- 8.Xi'an Thermal Power Research Institute Co., Ltd. (TPRI) - Generating Unit Inspection

- 9.China Huaneng Group Co., Ltd. Zhejiang Branch - Yunhe Jinshuitan Photovoltaic Power Station
- 10.China Huaneng Group Co., Ltd. Chongqing Branch - Autumn in Jinfeng Mountain
- 11.China Huaneng Group Co., Ltd. Fujian Branch - A corner of Fuzhou Power Plant
- 12.Huaneng Lancang River Hydropower Inc. - Harmony of the enterprise and local people, building a beautiful new relocation village
- 13.China Huaneng Group Hong Kong Limited - Spalding OCGT project successfully put into production
- 14.China Huaneng Group Co., Ltd. He'nan Branch - Blessing from the depths of mountains
- 15.China Huaneng Group Co., Ltd. Jiangxi Branch - Tangtou Natural Village of Yanxi Village designated as the assisted poverty alleviation village of Anyuan Power Plant





## About China Huaneng

China Huaneng Group Co., Ltd. (referred to as China Huaneng) is a key state-owned enterprise established with the approval of the State Council.

China Huaneng has a registered capital of RMB 34.9 billion yuan, with the main business scope covering: power development, investment, construction, operation and management; electricity (heat) production and sales; development, investment, construction, production, sales of industries and products related to finance, coal, transportation, new energy, environmental protection; and industrial investment, operation and management.

Established in 1985, China Huaneng has provided rich experience in the reform, development and technological advancement of the power industry in the course of more than 30 years of development; played a model role in improving the management level and increasing economic efficiency of power companies; and made significant contributions to meeting the demand for electricity use for economic and social development and realizing the preservation and appreciation of state-owned assets.

China Huaneng is committed to becoming a world-class company with global competitiveness. By the end of 2019, the installed capacity of wholly-owned and controlled power plants at home and abroad had reached 182.78GW, with development in industries such as coal, finance, technology R&D, transportation beginning to take shape to serve the development of the power industry as the main business. The Company has taken the lead among China's power generation companies to join the ranks of Global 500, ranking 286th in 2019.

## Organizational Chart

Work Organs of the Party Organization		
Discipline Inspection and Supervision Team	Organization Department of the Party Leading Group (Human Resources Department) ● Retiree Affairs Office	Office of the Leading Group for Inspection Work
Party Building Department (Publicity Department of the Party Leading Group)		Labor Union
Functional Departments		
General Office (Office of the Party Leading Group, Office of the Board of Directors)	Planning and Development Department	Finance and Assets Management Department
Enterprise Management and Legal Compliance Department	Marketing Department	Fuel Management Department
Safety Supervision Department	Production Management and Environmental Protection Department	Technology Innovation and Digitalization Department
Materials and Procurement Management Department	International Cooperation Department ● International Standardization Office	
Audit Department	Renewable Energy Department (Business Unit)	
Units Directly Affiliated to the Group		
China Huaneng Group Party School (Education and Training Center)	Energy Research Institute	
IT Center	News and Brand Management Center	Audit Center

Industrial Companies		
Huaneng International Power Development Corporation (Equity Management Center)	Huaneng Power International Inc. (Thermal Power Construction Center)	Huaneng Renewables Corporation Limited
Huaneng Nuclear Power Development Co., Ltd. (Nuclear Power Business Unit)	Huaneng Energy & Communications Holding Co., Ltd.	Huaneng Coal Industry Co., Ltd. (Coal Business Unit, Coal Chemical Management Office)
China Huaneng Group Fuel Co., Ltd.	Huaneng Capital Services Co., Ltd.	China Huaneng Finance Co., Ltd.
China Huaneng Group Clean Energy Research Institute Co., Ltd. (New Energy Technology R&D Center)	Huaneng Properties Co., Ltd. (Huaneng Integrated Industry Co., Ltd.)	China Huaneng Group Hong Kong Limited (Huaneng Overseas Enterprises Management Co., Ltd., Overseas Business Unit)
Xi'an Thermal Power Research Institute Co., Ltd. (Technology Innovation Center)	Huaneng Integrated Energy Services Co., Ltd.	China Huaneng Group (Hong Kong) Treasury Management Holding Limited

Regional Branches			
China Huaneng Group Co., Ltd. Xiong'an Branch	China Huaneng Group Co., Ltd. North China Branch (GreenGen Co., Ltd.)	China Huaneng Group Co., Ltd. Northeast Branch	China Huaneng Group Co., Ltd. East China Branch (Maintenance Center)
China Huaneng Group Co., Ltd. Central China Branch	China Huaneng Group Co., Ltd. South China Branch	China Huaneng Group Co., Ltd. Hebei Branch	China Huaneng Group Co., Ltd. Shanxi Branch
China Huaneng Group Co., Ltd. Jilin Branch	China Huaneng Group Co., Ltd. Heilongjiang Branch	China Huaneng Group Co., Ltd. Zhejiang Branch	China Huaneng Group Co., Ltd. Anhui Branch
China Huaneng Group Co., Ltd. Fujian Branch	China Huaneng Group Co., Ltd. Jiangxi Branch	China Huaneng Group Co., Ltd. Shandong Branch	China Huaneng Group Co., Ltd. Henan Branch
China Huaneng Group Co., Ltd. Hunan Branch	China Huaneng Group Co., Ltd. Guangxi Branch	China Huaneng Group Co., Ltd. Hainan Branch	China Huaneng Group Co., Ltd. Chongqing Branch
China Huaneng Group Co., Ltd. Guizhou Branch	China Huaneng Group Co., Ltd. Qinghai Branch	North United Power Co., Ltd.	Huaneng Jiangsu Energy Development Co., Ltd.
Huaneng Lancang River Hydropower Inc. (China Huaneng Group Co., Ltd. Yunnan Branch)		Huaneng Hulunbuir Energy Development Co., Ltd.	
Huaneng Sichuan Hydropower Co., Ltd.		Huaneng Shaanxi Power Generation Co., Ltd. (China Huaneng Group Co., Ltd. Northwest Branch)	
Huaneng Ningxia Energy Co., Ltd.		Huaneng Gansu Energy Development Co., Ltd.	
Huaneng Tibet Hydropower Development Investment Co., Ltd. (China Huaneng Group Co., Ltd. Tibet Branch)		Huaneng Xinjiang Energy Development Co., Ltd.	
Companies Directly Managed by the Group			
Huaneng Tendering Co., Ltd.		Huaneng Information Technology Co., Ltd.	



## KPI Table

Safety Responsibility Performance						
Indicator Name	Unit	2015	2016	2017	2018	2019
Investment in Work Safety (Technological Upgrading)	100 Million Yuan	3	2.11	4.17	5.43	11
Major Equipment Accident	Case	0	0	0	0	0
General Equipment Accident	Case	2	0	0	0	0
Accidents of Injury and Death	Case	3	4	4	2	6
First-class Obstacle	Case	23	21	15	17	14
Number of Unplanned Outages	Case	63	75	151	184	130
Unit Equivalent Availability Factor	%	94.35	94.69	94.19	94.21	94.22
Environmental Responsibility Performance						
Indicator Name	Unit	2015	2016	2017	2018	2019
Total Investment in Environmental Protection	100 Million Yuan	58.59	59.00	42.00	17.27	24.82
Total Investment in Energy-saving Technological Upgrading	100 Million Yuan	8.76	8.9	3.55	4.14	4.5
Low Carbon Clean Energy Installed Capacity	MW	46190	47970	53250	58580	61630
Low Carbon Clean Energy Proportion	%	28.80	29.00	31.00	33.18	33.72
Hydropower Installed Capacity	MW	20890	21040	22260	26070	26970
Wind Power Installed Capacity	MW	15080	16320	17850	18630	19960
Photovoltaic Installed Capacity	MW	1170	1570	2430	3180	4000
Coal Consumption for Power Supply	g/kWh	305.78	302.35	300.11	298.72	297.55
Auxiliary Power Ratio	%	4.24	4.11	4.01	3.97	3.78
Ash Comprehensive Utilization Rate	%	77.62	86.21	81.40	76.45	75.92
Sulfur Dioxide Emission Performance for Thermal Power Generation	g/kWh	0.267	0.189	0.100	0.074	0.072
Nitrogen Oxide Emission Performance for Thermal Power Generation	g/kWh	0.286	0.223	0.164	0.146	0.141
Smoke and Dust Emission Performance for Thermal Power Generation	g/kWh	0.060	0.035	0.018	0.012	0.011
Capacity of Ultra-low Emission Units	MW	24070	69210	105620	112490	115260
Proportion of Ultra-low Emission Units	%	21	59	90	95	96
Fresh Water Consumption for Power Generation	10,000 Tons	53708.61	52855.71	56745.66	58596.54	57396.49
Unit Water Consumption for Power Generation	Kg/kWh	1.04	1.03	1.09	1.04	1.06

Economic Responsibility Performance						
Indicator Name	Unit	2015	2016	2017	2018	2019
Installed Capacity	MW	160630	165540	171820	176570	182780
Thermal Power Installed Capacity	MW	123480	126620	129280	128690	131850
Power Generation	100 GWh	6146	6216	6496	7026	7057
Coal Production Capacity	10,000 Tons/Year	8330	6733	7790	7760	8260
Coal Production	10,000 Tons	6515	6220	7107	7086	7450
Total Assets	100 Million Yuan	9719	10029	10396	10733	11261
Total Operating Income	100 Million Yuan	2682	2461	2607	2786	3062
Total Profit	100 Million Yuan	306	139	119	144	178
Asset-Liability Ratio	%	82.55	82.49	78.88	76.98	73.70
Total Number of Scientific and Technical Personnel	People	1977	2163	2993	1966	2388
National Authorized Patent	Item	306	455	541	648	777
Among Them: Invention Patent	Item	64	122	199	163	121
Provincial and Ministerial Level-and-above Scientific and Technological Achievements Award	Item	21	31	22	21	21
SASAC Performance Appraisal	Class	A	A	A	A	A
Social Responsibility Performance						
Indicator Name	Unit	2015	2016	2017	2018	2019
Paid Taxes	100 Million Yuan	357	293	228	255	267
Number of In-Service Employees	People	140989	143810	138473	135329	131579
Number of New Employment throughout the Year	People	8413	7051	4754	4475	4222
Number of Female Employees	People	33537	35096	33929	32415	30319
Female Manager Ratio	%	32	32	32	38	32
Labor Contract Signing Rate	%	100	100	100	100	100
Collective Contract Coverage	%	100	100	100	100	100
Social Insurance Coverage	%	100	100	100	100	100
Labor Union Membership Rate	%	100	100	100	100	100
Employee Health Check and Health File Coverage	%	100	100	100	100	100
Training Time Per Employee	Hour	58	71	64	85	70
Employee Training Coverage	%	73	70	66	78	79
Total Amount of Donation	Ten Thousand Yuan	6520	57598	55609	60377	73120
Employee Volunteers	Person-times	76500	80500	80750	80843	80710



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	Comprehensively Upgrade the Development Quality	GRI201,203	M1.1,M1.6—M1.8, S1.1,S1.2,S1.4	P22
	Build Partnership Platforms	GRI206	M3.1,M3.3,M3.4, M3.6—M3.8,M3.10—3.14	P26
	Create a Moderately Prosperous Life	GRI411,413	S4.5,S4.6,S4.9,S4.10,S4.12—S4.14	P32
	Contribute Chinese Wisdom on the International Stage	GRI203	M3.6	P42

Contents	GRI Standard	CASS—CSR4.0	Page	
<b>Part II: As an Energy Pioneer, Huaneng Serves the Country by Securing Power Supply</b>	Guarantee Stable Power Supply	GRI103	M2.2, M3.6	P46
	Deepen Scientific and Technological Innovation	GRI201	M2.4—2.7	P48
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# Rating Report

## Rating Report for "2019 Sustainability Report of China Huaneng Group Co., Ltd."

Entrusted by China Huaneng Group Co., Ltd., experts have been selected from "China Corporate Social Responsibility Report Rating Expert Committee" to form a rating group to rate the "2019 Sustainability Report of China Huaneng Group Co., Ltd." (hereinafter referred to as "Report").

### I. Basis of Rating

"Guidelines for Corporate Social Responsibility Reporting (CASS-CSR4.0)" of the Chinese Academy of Social Sciences and "China CSR Report Rating Standards (2020)" of China Expert Committee on CSR Report Rating.

### II. Rating Process

- 1.The rating team reviews and verifies the "Confirmation of Processes of the Corporate Social Responsibility Report" and relevant evidential documents submitted by the team that has compiled the Report;
- 2.The rating team evaluates the process for writing the Report and the contents of the Report, and drafts and finalizes this rating report;
- 3.The Vice President of the Expert Committee, the leader and experts of the rating team jointly review and sign the rating report.

### III. Conclusion

#### Process (★★★★★)

The company set up a social responsibility management committee with a Party Leading Group member and Vice President as the director to take control of key issues. The Social Responsibility Office of the Planning and Development Department took the lead in setting up a report compilation team. The head of the department centrally planned and guided the specific compilation tasks, and the board of directors is responsible for the final review. The Report's functional role and values were explicitly defined as an important instrument to disclose duty performance information in line with relevant requirements, improve the social responsibility management system, and enhance the corporate brand image. The substantive issues were identified according to international and domestic social responsibility standards, industry-wide benchmarking analysis, major company issues, stakeholder investigations, etc. The report will be published on the Company's official website and incorporated in the press conference for social responsibility reports of central SOEs for the second release. It will be presented in different forms including electronic file, printed matter, Chinese-English bilingual version, and a video version. All these prove its outstanding process performance.

#### Materiality (★★★★★)

The Report systematically disclosed key topics for discussion in the power production industry, such as safeguarding power supply, scientific and technological innovation, developing green power, safe production, occupational health management, saving energy resources, circular economy, reducing "three wastes" emissions, etc. with detailed narration and excellent materiality performance.

#### Integrity (★★★★★)

From the perspectives of "As a Role Model among Chinese Companies, Huaneng Carries out Practical Actions to Help China Thrive" and "As an Energy Pioneer, Huaneng Serves the Country by Securing Power Supply", the main body of the Report disclosed 91.53% of the core indicators of the power production industry with remarkable integrity performance.

#### Balance (★★★★★)

The Report disclosed negative data including "number of major equipment accidents", "number of general equipment accidents", "number of accidents involving casualties", "number of unplanned outages", "staff turnover rate", etc. with detailed description of the cause, process and handling result of the safe operation accident of the outsourced worker, with excellent balance performance.

#### Comparability (★★★★★)

The Report disclosed the comparative data for 3 consecutive years of 55 indicators, such as "gross revenue", "total number of scientific and technological staff members", "investment in safe production", "total donations", "installed capacity for low-carbon clean energy" and "ash comprehensive utilization rate"; horizontal comparison was also made based on the ranking "No. 286 in Global 500", "No. 6 in the Top 300 Enterprises in Responsibility Development Index", etc. with splendid comparability performance.

#### Readability (★★★★★)

The Report is themed on "Committed to National Rejuvenation, and Shouldering Responsibility" and divided into two volumes systematically. It covers the Company's philosophy in performing corporate responsibilities, actions and performance under the key topics including power supply, technological innovation, safe production, employee development, win-win cooperation, charity, and environmental protection, and interprets the Company's in-depth understanding about the fulfillment of social responsibilities; big realistic photos of the corresponding performance scenario are used at the beginning of each chapter, with the key statement of President Xi Jinping and outline of the performance results, facilitating readers to quickly comprehend the key points of the chapters and improving the readability; third-parties' testimony was referred to as support of effective performance of corporate responsibilities, making the Report more vivid and trustful; not to mention the QR code printed in the Report for extended reading of in-depth interpretation, which offers an access to deeper communication and achieves better readability.

#### Innovativeness (★★★★★)

The Report starts with focus on four major responsibilities to respond to the hot political issues including Party building, poverty alleviation, ecological development, and B&R Initiative, interpreting the values and responsibilities the Company should pursue and assume as a central SOE to comply with the major national guiding principles and resolutely implement macro national policies; the Company released "China Huaneng's White Paper on Targeted Poverty Alleviation", a special report on social responsibility performance, and facilitated its subsidiaries including Huaneng Power International, Lancang River Hydropower, to publish their respective CSR reports, forming a multi-form, multi-level report dissemination matrix, which not only deepened the vertical integration of social responsibilities, but also improved the communication values of the reports; the Company also carried out the "Selection and Appraisal of the Most Beautiful Responsibility Pictures of China Huaneng in 2019", promoting the quality of information disclosed in the Report and facilitating the further completion of its CSR report management system, showing preeminent innovative performance.

#### Overall Rating (★★★★★+)

According to the rating team, the 2019 Sustainability Report of China Huaneng Group Co., Ltd. was rated five-star in terms of all the indicators including process, materiality, integrity, balance, comparability, readability, and innovativeness. Consequently, the report was rated as "five-star+" as a model corporate social responsibility report.

### IV. Suggestions for Improvement

Add more disclosure information about core industrial indicators to improve the Report's integrity.



China Huaneng's Sustainability Report Received Five-Star Rating for the Ninth Consecutive Year

中国专家委员会  
中国专家委员会  
Chinese Expert Committee on CSR Report Rating  
Vice President of Chinese Expert Committee on CSR Report Rating

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张晓松  
Leader of the Rating Team  
Expert of the Rating Team

Date of Issuance: July 30, 2020



Scan QR Code to View Enterprise Rating Files

# Feedback



Dear readers:

Thank you for reading "2019 Sustainability Report of China Huaneng Group Co., Ltd." We would like to improve the quality of both our social responsibility work and the CSR report. Scan the QR code below and send us any comments or suggestions you may have, which will be of great help for us. Thank you!

