



国家电投  
SPIC  
**社会责任报告**  
SOCIAL RESPONSIBILITY REPORT  
**2023**



先进能源技术开发商  
清洁低碳能源供应商  
能源生态系统集成商

Advanced Energy Technology Provider  
Clean Low-carbon Energy Supplier  
Energy Ecosystem Integrator

The image shows the SPIC headoffice building, a modern glass skyscraper with a blue facade. The SPIC logo, a stylized 'S' composed of red and green curved segments, is positioned to the left of the Chinese characters '国家电投' (State Power Investment Corporation). The building is set against a clear blue sky with scattered white clouds. In the foreground, the green foliage of trees is visible, partially obscuring the lower part of the building.

国家电投

国家电投总部大楼实现 100% 绿色用电  
SPIC headoffice 100% powered by green electricity

# 报告导读

## 时间范围

2023 年 1 月 1 日至 2023 年 12 月 31 日，部分内容超出上述范围。

## 发布周期

国家电力投资集团有限公司社会责任报告为年度报告。

## 组织范围

报告覆盖国家电力投资集团有限公司整体，为便于表达和阅读，在报告中以“国家电力投资集团有限公司”“国家电投”“集团”“公司”或“我们”表示。

## 参考依据

国务院国资委《关于新时代中央企业高标准履行社会责任的指导意见》

中国社科院《中国企业社会责任报告指南（CASS-CSR 4.0）》

国家标准化管理委员会《社会责任报告编写指南》（GB/T 36001-2015）

全球报告倡议组织《可持续发展报告指南》（GRI Standards）

国际标准化组织《ISO 26000：社会责任指南（2010）》

联合国可持续发展目标 2030（SDGs）

## 数据说明

本报告所引用的历年数据为最终统计数据，财务数据如与年报有出入，以年报为准。报告中的财务数据以人民币为单位，特别说明除外。

## 报告版本

公司社会责任报告以纸质版和电子版两种形式提供。

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# Introduction

## Time Frame

From January 1, 2023 to December 31, 2023. Some content exceeds the time frame mentioned above.

## Release Cycle

The Social Responsibility Report of State Power Investment Corporation Limited is issued annually.

## Coverage

The report covers State Power Investment Corporation Limited. For the convenience of expression and reading, “State Power Investment Corporation Limited”, “SPIC”, “Group”, “Company”, and “we” are respectively used in proper positions in the report.

## References

*Guidelines to the State-owned Enterprises Directly under the Central Government on Fulfilling Corporate Social Responsibilities per Higher Standards in the New Era* issued by the State-owned Assets Supervision and Administration Commission of the State Council

*Guidelines on Corporate Social Responsibility Reporting for Chinese Enterprises (CASS-CSR 4.0)* issued by the Chinese Academy of Social Sciences

*Guidance on Social Responsibility Reporting* (GB/T 36001-2015) issued by the Standardization Administration of China

*Sustainability Reporting Guidelines* issued by Global Reporting Initiative (GRI-standards)

*ISO 26000: Guidance on Social Responsibility (2010)* issued by International Organization for Standardization

Sustainable Development Goals 2030 (SDGs)

## Data

The data over the years cited in the report is the final statistical data, and in case there is a difference between the financial data and the annual report, the latter shall prevail. Unless otherwise specified, the unit of the financial data in the report is RMB.

## Version

The Social Responsibility Report is available both in print and online.

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# 董事长致辞

## Message from the Chairman

能源是人类文明进步的基础和动力，攸关国计民生和国家安全。站在“两个一百年”奋斗目标的历史交汇点上，面对全球能源和科技革命风起云涌，国家电投坚持以习近平新时代中国特色社会主义思想为指导，深入贯彻落实党的二十大精神，坚决落实“四个革命、一个合作”能源安全新战略，以加快建设新型能源体系为牵引，积极培育能源新质生产力，助力高质量发展走深走实，努力谱写建设世界一流清洁能源企业、支撑和服务中国式现代化的崭新篇章。

Energy serves as foundation and drive for human civilization progress, and bears on national economy, people's wellbeing and national security. Responding to the historic crossroad of the "Two Centenary Goals", and the unfolding global energy and technological revolutions, SPIC follows the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and implements the guiding principles from the 20<sup>th</sup> National Congress of the Communist Party of China (CPC), and the new energy security strategy of "Four Revolutions, and One Cooperation". Driven by the accelerating establishment of the new energy system, we take active efforts to foster new quality productive forces, further advance the high-quality development, and embark on a new journey to grow into a world-leading clean energy company, underpin and serve Chinese modernization drive.

**坚持绿色发展，铺就生态文明新画卷。我们以绿色为笔，书写能源清洁低碳供给新篇章。**党的二十大报告提出，要加快发展方式绿色转型，实施全面节约战略，发展绿色低碳产业。我们紧紧围绕“创造绿色价值”的企业使命，把清洁能源产业优势融入美丽中国、乡村振兴和生态文明建设等国家战略，积极探索能源绿色转型。截至2023年底，总装机规模达2.37亿千瓦，其中，清洁能源占比69.89%，光伏装机、新能源装机、清洁能源装机规模持续位居全球第一，持续巩固清洁低碳发展优势。我们坚持将绿色发展理念融入水电、火电、新能源、矿山、碳排放等多个领域，探索形成“光伏+种植”沙戈荒治理模式，在内蒙古磴口建设光伏治沙项目、在青海共和塔拉滩建设水光互补新能源基地，在山东海阳、乳山实现“暖核一号”核能双城供暖新模式，让所在地居民感受到“绿色”价值和“别样”温暖。

**We adhere to green and low-carbon energy development for boosting ecological conservation.** Just as outlined in the 20<sup>th</sup> National Congress of the CPC, efforts should be redoubled to accelerate the transition to a model of green development, implement a comprehensive conservation strategy, and support the development of green and low-carbon industries. Focusing on our corporate mission of "Creating Green Value", we align our advantages of clean energy industries with national strategies of Beautiful China, rural revitalization, ecological conservation in pursuit of green energy transition. As of the end of 2023, our installed capacity has totaled 237 GW, with that of green energy accounting for 69.89%. We maintain the first position globally for our installed capacities of PV, new energy and clean energy, and continue to anchor our strength in clean and low-carbon development. Our green development vision has been integrated in multiple fields such as hydropower, thermal power, new energy, mining, and carbon emissions. In particular, we have explored and formed the "PV + planting" desertification control model, such as a PV and desertification control project in Dengkou, Inner Mongolia. Furthermore, we have built a new energy base integrating hydropower and PV power in Tara Beach, Gonghe County, Qinghai Province, and a "Warm-U-Clear No.1"-based heating project serving both Haiyang and Rushan, Shandong Province, brining green value and clean heating to the local residents.

**创新驱动发展，打造新质生产力引擎。我们以创新为帆，开启能源技术迭代升级新航程。**发挥新型举国体制优势，坚决当好科技创新“国家队”，高质量推进核电、重燃两个重大专项型号技术集智攻关，“国和一号”示范工程建设稳步推进，300兆瓦级F级重型燃气轮机首台样机总装下线。坚决贯彻落实习近平总书记“一定要将光伏产业做好”的重要指示精神，在大庆建设光伏储能实证实验平台，验证不同应用场景下光储关键设备以及发电系统的关键技术和性能，为国家制定产业政策、技术标准提供科学依据。我们积极推动传统产业升级与新兴产业布局，核能、水电等多个平台，纯氢燃机等多项成果分别入选国家能源局“十四五”首批国家能源创新平台和首台（套）重大技术装备；深入推进智改数转，建设“领航者”智慧光伏示范项目，建设实时在线测试分析及故障分析系统，相关技术达到国际领先水平。

**We set out to upgrade energy technologies driven by innovation, and foster new quality productive forces.** By leveraging the new system for mobilizing resources nationwide, we strive to make technological breakthroughs in nuclear power and heavy-duty gas turbine. Our "Guohe One" demonstration project has proceeded steadily, and the first prototype of the 300 MW F-class heavy-duty gas turbine rolled off the assembly line. Upholding President Xi Jinping's remark that "SPIC should bolster the PV industry", we

have built a PV power and energy storage demonstration experimental platform in Daqing. This platform works to verify the key technologies and performance of key PV power and energy storage equipment as well as power generation systems under different application scenarios, which provides scientific basis for the country to devise industrial policies and technical standards. We focus our endeavors on upgrading traditional industries and boosting emerging industries. Our platforms in nuclear energy, hydropower, and other fields, and achievements, such as pure hydrogen gas turbines, have been selected into the first batch of national energy innovation platforms, and the first major technical equipment by the National Energy Administration during the "14<sup>th</sup> Five-Year Plan". Moreover, we have deepened the digital and intelligent transformation. To be specific, we launched the "Linghangzhe" intelligent PV demonstration project, and the real-time online testing and fault analysis system. And our digital and intelligent technologies have been well recognized internationally.

**服务幸福生活，守护人民美好生活图景。我们以大爱之心，呵护人民群众对美好生活的向往。**我们坚决打赢能源保供攻坚战，为第六届进博会贡献50%绿电，保障杭州亚运会、成都大运会等能源供应，保定、湖州、兰考等综合智慧零碳电厂项目并网投运，圆满完成迎峰度夏、迎峰度冬等重大保电任务；“震不垮的担当”胡努特鲁电厂在土耳其两次7.8级强震中成为当地唯一没有间断运行的发电厂。我们以绿色电力帮扶、特色产业帮扶、教育帮扶、消费帮扶等形式，扎实开展定点帮扶和援助，连续三年获得中央企业帮扶成效考核评价最高等级“好”。推动用户侧智慧能源稳步发展，推动四川康定等7个县成功申报国家农村能源革命试点县；在四川美姑县，援建彝家新寨，开展黑山羊、红花椒产业帮扶，蹚出彝族群众致富路；打造“映山红”公益品牌，传递国家电投的爱与责任。

**We undertake our social responsibility to meet the people's aspirations for a better life.** With robust energy supply capacity, we met 50% green power need of the 6<sup>th</sup> China International Import Expo, and supplied sufficient power to the 19<sup>th</sup> Asian Games in Hangzhou, and FISU World University Games in Chengdu. SEPs in Baoding, Huzhou and Lankao were connected to the grid, and fulfilled power supply tasks in the peak periods of summer and winter. The thermal power plant project in Hunutlu, Türkiye is the only power plant that still worked in two 7.8-magnitude earthquakes. We have remained the highest rating in the assistance performance appraisals for 3 years in a row due to our satisfactory performance in targeted assistance for rural revitalization through green power, featured agriculture, education and consumption. In addition, we have made steady progress in user-end smart energy by helping 7 counties including Kangding in Sichuan apply for pilot counties of rural energy revolution. In Meigu County, Sichuan Province, we paved new poverty relief ways for the Yi ethnic group, such as constructing the new village, raising black goats, and planting red pepper. Furthermore, we have consolidated the "Yingshanhong" public welfare program, engaging in more public welfare activities.

2024年是新中国成立75周年，是“四个革命、一个合作”能源安全新战略提出10周年，我们将坚持把高质量发展作为硬道理，以做强做优做大国有资本和国有企业为总目标，以积极服务国家能源安全新战略为总要求，积极发挥科技创新、产业控制、安全支撑作用，高标准履行能源央企社会责任，不断增强核心功能，提高核心竞争力，努力建设世界一流清洁能源企业，为全面推进中国式现代化建设、实现中华民族伟大复兴作出新的更大贡献！

2024 marks the 75<sup>th</sup> anniversary of the founding of the People's Republic of China, and the 10<sup>th</sup> anniversary of the new energy security strategy of "Four Revolutions, and One Cooperation". In 2024, we will stay committed to bolstering high-quality development, strengthening, expanding, and increasing the returns on state capital and enhancing the strength, quality, and size of SOEs, as well as serving the new national energy security strategy. To this end, we will give full play to scientific and technological innovation, industrial control, and security support, assume the social responsibility as a SOE, and build up our core function and core competitiveness. We will pool our endeavors to grow into a world-leading clean energy company, and make greater contributions to advancing the Chinese modernization drive across the board, and realizing the Chinese Dream of national rejuvenation!

国家电投董事长、党组书记 刘明胜  
Liu Mingsheng, Chairman of SPIC

国家电投江西峡江水电站  
SPIC Xiajiang Hydropower Station in Jiangxi

# 目录

## CONTENTS

关于我们  
About Us

| 01

**13** | **产品卓越**  
以能源低碳化绘就多彩河山  
**Excellent Products**  
Low-carbon Energy for Green Environment

15 | 打造清洁能源  
Clean Energy

23 | 绿色低碳运营  
Green and Low-carbon Operation

27 | 关注气候变化  
Concern for Climate Change

**31** | **品牌卓著**  
以负责任经营诠释为民初心  
**Remarkable Brand**  
Responsible Operation for People-centered Aspiration

33 | 心系员工福祉  
Commitment to Employee Wellbeing

45 | 助力和谐社区  
Contribution to Community Harmony

50 | 争做全球公民  
Growing into a Global Citizen

**59** | **创新领先**  
以新质生产力开拓能源革命  
**Leading Innovation**  
New Quality Productive Forces for Energy Revolution

61 | 勇攀创新高地  
Striving for New Innovation High

64 | 深耕新兴产业  
Engagement in Emerging Industries

76 | 共赴崭新未来  
Cooperation for Bright Future

**81** | **治理现代**  
以高质量发展勇创世界一流  
**Modern Governance**  
High-quality Development for a World-class Business

83 | 完善公司治理  
Better Corporate Governance

87 | 严格依法合规  
Stricter Compliance with Laws

88 | 深化企业改革  
Extensive SOE Reform

责任专题  
Cases of Responsibility | 91

责任管理  
CSR Management | 93

未来展望  
Looking Forward | 101

附录  
Appendix | 103

## 关于我们 About Us

### 公司概况 SPIC Overview

国家电力投资集团有限公司（简称“国家电投”）是中央直接管理的特大型国有重要骨干企业，肩负保障国家能源安全的重要使命，由中国电力投资集团公司与国家核电技术有限公司于 2015 年 5 月重组成立。

截至 2023 年 12 月底，国家电投控股装机规模达到 2.37 亿千瓦，其中清洁能源占比 69.89%。

State Power Investment Corporation Limited (SPIC) is a state-owned enterprise under the central government of China, shouldering the critical mission of safeguarding national energy security. SPIC was established in May 2015 through the merger of China Power Investment Corporation and State Nuclear Power Technology Corporation.

As of the end of 2023, SPIC has posted the installed capacity up to 237 GW, with that of clean energy accounting for 69.89%.

在 2023 年《财富》世界 500 强排名第 **262** 位，连续 **12** 年进入世界 500 强  
光伏控股装机 **6918.75** 万千瓦，连续 **8** 年保持世界第一

In 2023, we ranked the **262<sup>nd</sup>** place of the Fortune Global 500, the **12<sup>th</sup>** inclusion in the list. We have registered the PV installed capacity of **69.19** GW, and remained the global top spot for **8** consecutive years.

国家电投内蒙古霍林郭勒多能互补集成优化示范工程风电场

SPIC Multi-energy Complement, Integration, and Optimization Demonstration Wind Farm Project in Hologol, Inner Mongolia

“码”上进入国家电投数字博览馆  
一座跨越百年时光，反映企业革命史、奋斗史、实践史的博览馆

Scan the QR code to access SPIC Digital Museum  
A museum presenting SPIC's development history in the past century

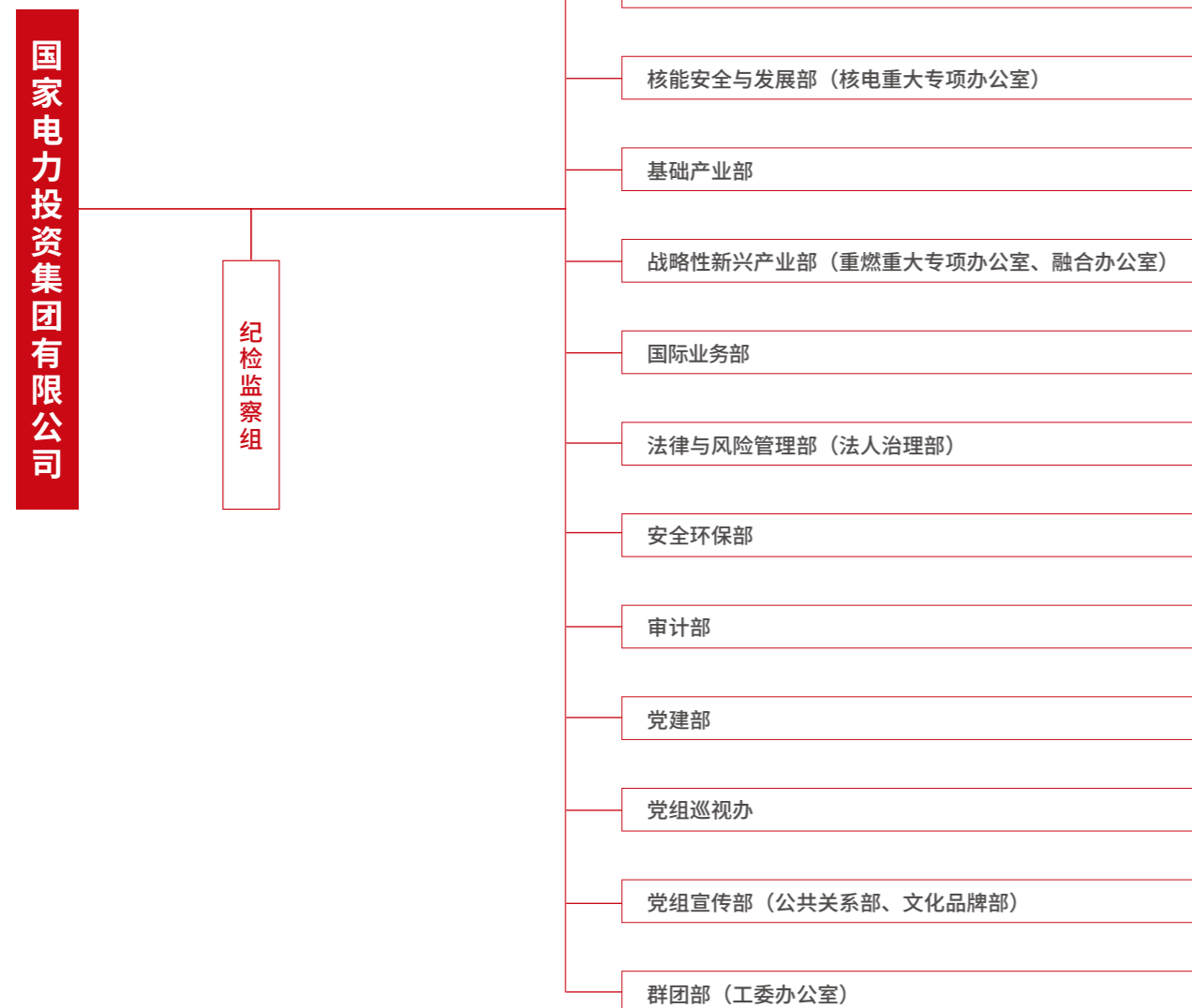


## 产业板块 Business Segments



## 组织架构

## Organizational Structure





## 企业文化 Corporate Culture

国家电投持续深化企业文化建设，2023 年，举办“国家电投好故事”“风光杯”短视频大赛等活动，总结凝练、彰显传播国家电投践行“绿色、创新、融合，真信、真干、真成”企业核心价值观的生动案例和典型实践，为进一步推动国家电投高质量发展汇聚更加强大的思想基础和奋进力量。

SPIC always advances its corporate culture development. In 2023, we organized “SPIC Stories” and “Fengguang Cup” short video contests. Our efforts are made to condense, manifest, and spread the vivid cases and representative practices of the core corporate values “Pursue Green, Innovative and Integrated Development; Deliver Great Performance with Belief”. This aims to pool stronger ideological basis and more striving force for our high-quality development.

### 企业愿景

建设具有全球竞争力的世界一流清洁能源企业

### Corporate Vision

Strive to Be a World Class Clean Energy Company with Global Competitiveness

### 企业使命

创造绿色价值

### Corporate Mission

Create Green Value

### 企业核心价值观

绿色、创新、融合，真信、真干、真成

### Core Values

Pursue Green, Innovative and Integrated Development; Deliver Great Performance with Belief

### 员工行为公约

1. 以客户为中心
2. 热爱自己的工作
3. 按制度流程办事
4. 创造价值
5. 像钉钉子一样落实
6. 协作支持一公里
7. 当绿色品牌代言人
8. 守住底线
9. 做一个让人舒服的人
10. 持续提升自我

### Code of Conduct for Employees

1. Be customer-centered
2. Love what you do
3. Follow company operating procedures
4. Create value
5. Deliver solid outcomes
6. Be committed to collaboration
7. Play your part in representing our green brand
8. Never cross the line
9. Be sociable and easy going
10. Engage in constant self-improvement

### 干部行为公约

1. 信念坚定 对党忠诚
2. 勇于创新 敢于担当
3. 知人善用 善于成事
4. 甘于奉献 率先垂范
5. 顾全大局 精诚团结
6. 平等待人 关爱员工
7. 清正廉洁 修身齐家
8. 自我批判 持续提升

### Code of Conduct for Officials

1. Be loyal to the Party with strong faith
2. Be innovative and responsible
3. Be good at employing and getting things done
4. Be willing to contribute and lead by example
5. Bear in mind the overall interests and be united
6. Treat people equally and care for employees
7. Be upright and incorruptible and cultivate your morality
8. Engage in self-criticism for continuous self-improvement

国家电投广西兴安坵坪风电场  
SPIC Qiuping Wind Farm in Xing'an, Guangxi



“码”上了解“国家电投好故事”  
的精彩内容

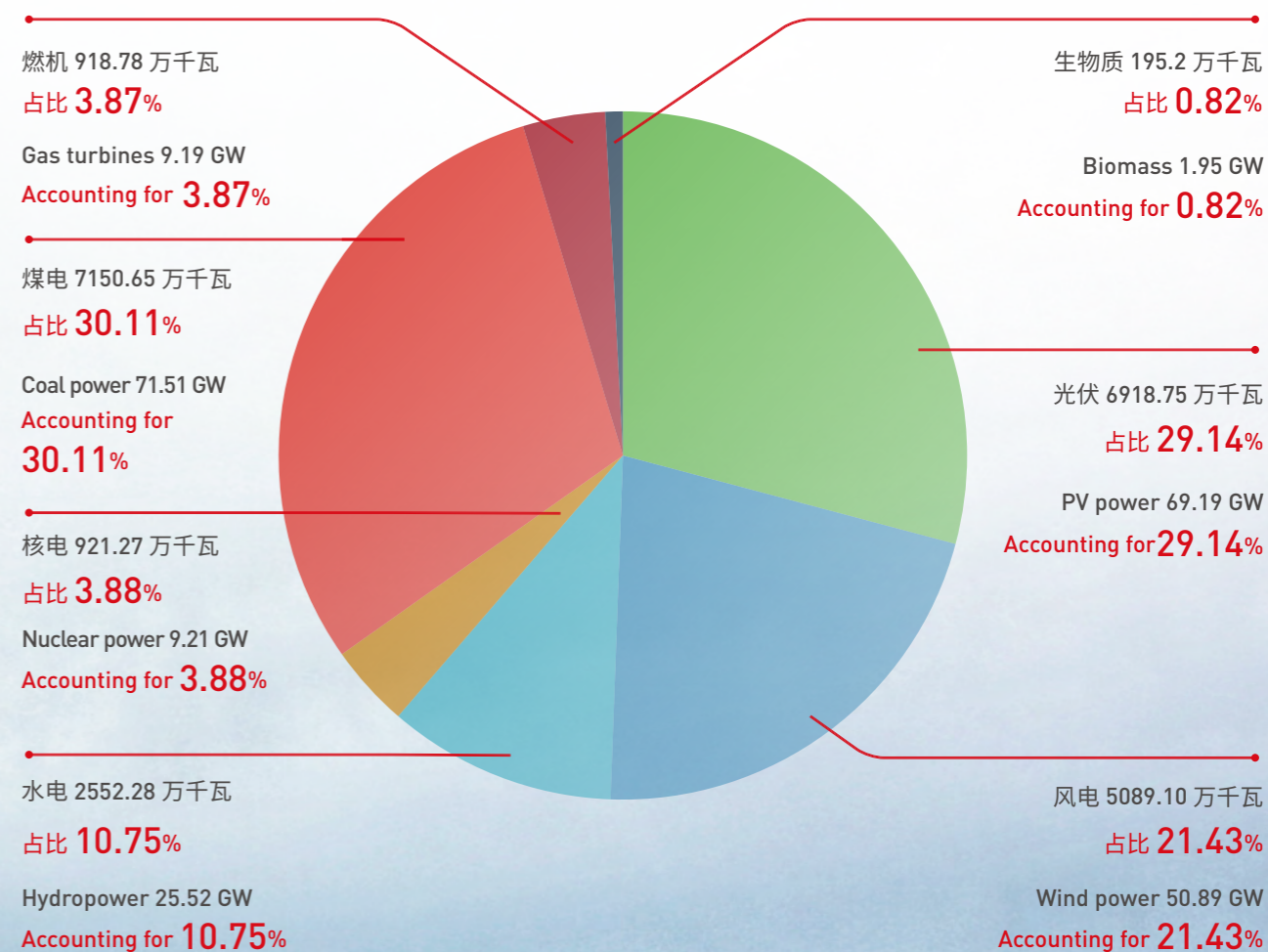
Scan the QR code to access  
“SPIC Stories”

## 经营数据 Operation Data

资产总额 Total assets	营业收入 Operation revenue	利润总额 Total profit	净利润 Net profit
<b>17534.77</b>	<b>3857.1</b>	<b>406.56</b>	<b>330.66</b>
亿元 RMB 1,753.48 billion	亿元 RMB 385.71 billion	亿元 RMB 40.66 billion	亿元 RMB 33.07 billion

电力装机总量 Total installed capacity	新增装机 New installed capacity	原煤生产量 Raw coal production	电解铝产量 Aluminum production
<b>2.37</b>	<b>2763.77</b>	<b>8095.21</b>	<b>268.03</b>
亿千瓦 237 GW	万千瓦 27.64 GW	万吨 80.95 million tons	万吨 (不含青海省投) 2.68 million tons (excluding that of Qinghai Provincial Investment)

清洁能源总装机 Total installed capacity of clean energy	占比 Accounting for
<b>1.66</b> 亿千瓦 <b>166</b> GW	<b>69.89</b> %



国家电投江苏盐城滨海北海上海风电场  
SPIC Binhai Offshore Wind Farm in Yancheng, Jiangsu

# 01

## 产品卓越

## 以能源低碳化 绘就多彩河山

“创造绿色价值”是国家电投的企业使命。国家电投坚决落实“四个革命、一个合作”能源安全新战略，坚持绿色低碳发展方向不动摇，在清洁能源转型上真抓实干，在绿色发展中干出新成绩，为中国式现代化建设提供安全可靠的清洁能源保障。

### Excellent Products

### Low-carbon Energy for Green Environment

“Create Green Value” is the SPIC’s corporate mission. For this purpose, we will practice the new energy security strategy of “Four Revolutions, and One Cooperation” (energy consumption, supply, technology, and institutional revolutions; intensive international cooperation), stand firm in green and low-carbon development, work hard on clean energy transformation, and make fresh progress in green development. All these efforts are aimed to provide secure clean energy guarantee for Chinese modernization drive.



国家电投建设运营的国家光伏、储能实证实验平台（大庆基地）是全球首个光伏、储能户外实证实验平台

The national PV power and energy storage demonstration experimental platform (Daqing Base) invested and operated by SPIC is the world’s first PV power and energy storage outdoor demonstration experimental platform

## 打造清洁能源

### Clean Energy

顺势而为、乘势而上，国家电投加快推动新能源高质量发展、实现能源结构转型，建设世界一流清洁能源企业，引领世界清洁能源产业升级。

Embracing the tendency, SPIC has accelerated its efforts to promote high-quality new energy development, and facilitate energy structure transformation in order to fulfill its aspiration of growing into a world-class clean energy company, and leading the upgrade of the world's clean energy industry.

#### 青海海南州戈壁清洁能源基地 Hainan Prefecture Gobi Clean Energy Base in Qinghai

总体建设规模为 1560 万千瓦，其中风电 840 万千瓦、光伏 720 万千瓦。依托周边电厂（含近区）配套扩能改造升级火电、抽水蓄能项目作为支撑性电源，配套特高压输电线路起点位于海南州，统筹配建新型储能、水电扩容改造、光热发电等灵活性资源。

Overall planned capacity: 15.6 GW, including 8.4 GW of wind power and 7.2 GW of PV power. Building on surrounding power stations (including those in nearby areas), capacity expansion and transformation projects of thermal power, and pumped storage have been implemented as the underpinning power sources of the Base. With the help of UHV transmission lines starting from Hainan Prefecture, some flexible power sources are leveraged as well, such as new energy storage, hydropower expansion and transformation, and solar power generation.

#### 内蒙古乌兰察布基地 Ulanqab Base in Inner Mongolia

2023 年 12 月 31 日，全球陆上单体最大风电项目——国家电投乌兰察布风电基地一期 600 万千瓦示范项目首批机组并网发电。该项目规划区域总面积约 2072 平方千米，首批工程总投资 60 亿元，共安装 216 台风机。项目全容量并网发电后，每年可提供 180 亿千瓦时清洁电能，相当于替代 600 万吨标准煤，减少二氧化碳排放 1530 万吨。

On December 31, 2023, the first batch of units for the 6 GW Demonstration Project were connected to the grid. This demonstration project is the first phase project of the SPIC Ulanqab Wind Power Base, the world's largest single onshore wind farm at present. This project covers the planned area of 2,072 km<sup>2</sup>, and will install 216 wind turbines. Its first investment totaled RMB 6 billion. After connection to grid in full capacity, the project can supply 18 TWh clean electricity annually, which will replace 6 million tons of standard coal, and reduce carbon dioxide emissions by 15.3 million tons.

#### 广东廉江核电基地 SPIC Lianjiang Nuclear Power Base in Guangdong

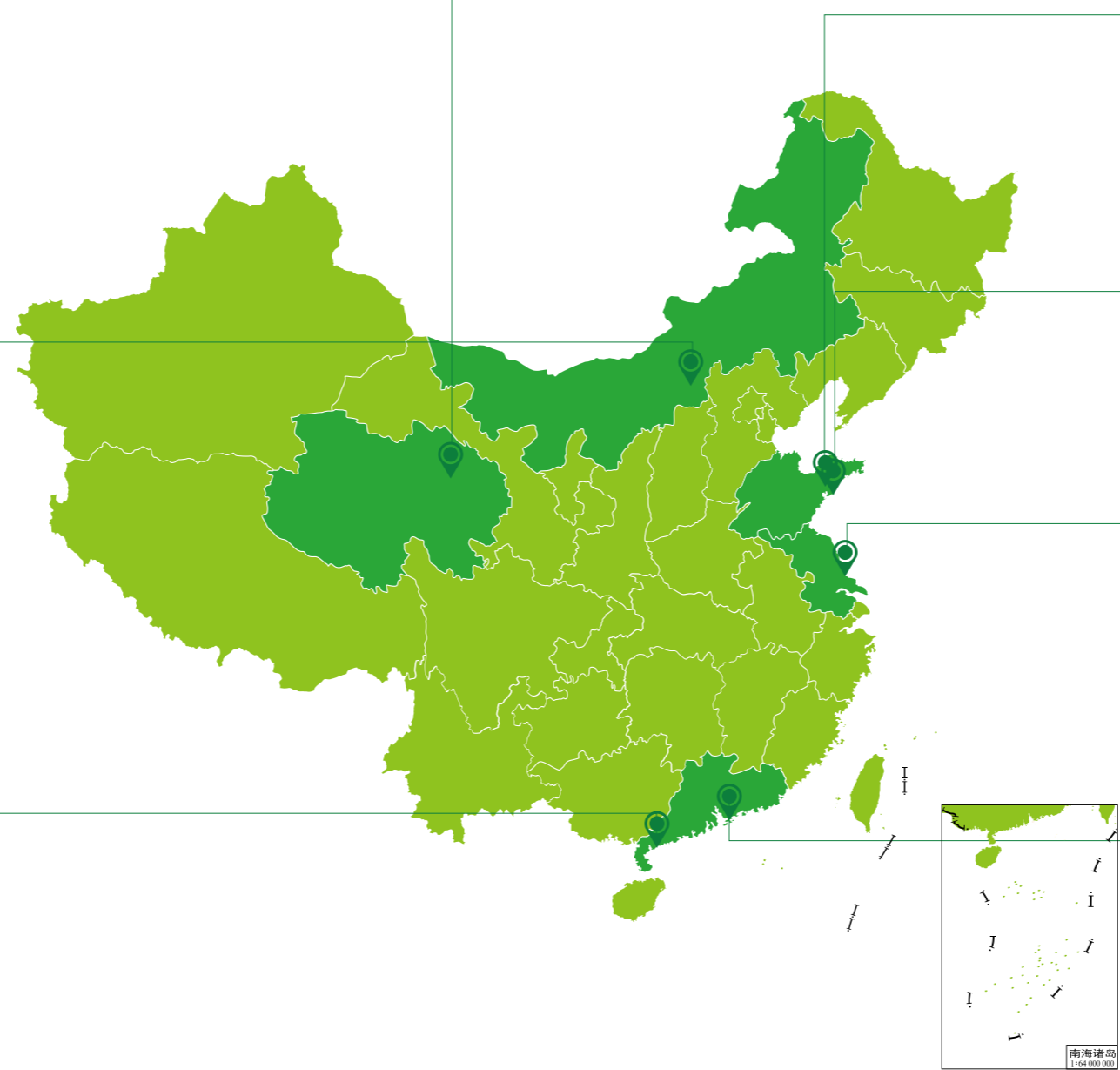
廉江核电项目规划建设 6 台百万千瓦级压水堆核电机组，总装机容量 862 万千瓦。2023 年 9 月，一期工程正式开工，建设两台单机额定容量为 125 万千瓦的 CAP1000 核电机组，计划于 2028 年投运。

It is planned to allocate six GW-level PWR nuclear power units, with installed capacity totaling 8.62 GW in Lianjiang Nuclear Power Project. In September 2023, the first phase was commenced to build two CAP1000 nuclear power units, with the rated capacity of each unit reaching 1.25 GW. These units will be put into operation in 2028 as scheduled.

## 大型清洁能源基地 Large-scale Clean Energy Bases

大型清洁能源基地是构建新型电力系统的重要抓手。国家电投集中式、规模化锻造新能源大基地，为实现“双碳”目标提供重要支撑。2023 年，清洁能源大基地进展顺利。

As large-scale clean energy bases are considered a major move to establish a new power system, SPIC devotes itself to constructing large new energy bases in a centralized manner as an effort to pursue the dual carbon goals of peaking carbon emissions by 2030 and reaching carbon neutrality by 2060. In 2023, the large clean energy bases progressed smoothly.



#### 山东海阳核电基地 Haiyang Nuclear Power Base in Shandong

海阳核电项目规划建设 6 台百万千瓦级核电机组，总装机 750 万千瓦，2023 年 12 月 21 日，山东核电海阳核电 3 号核岛反应堆压力容器筒体吊装就位。

It is planned to equip the Haiyang Nuclear Power Base in Shandong with six sets of GW-level nuclear power units, with installed capacity totaling 7.5 GW. On December 21, 2023, the pressure vessel shell of the reactor for the No. 3 nuclear island was hoisted in position.

#### 山东半岛海上风电基地 Offshore Wind Power Base in Shandong Peninsula

规划装机容量 140 万千瓦，半岛南 3 号项目装机 30 万千瓦已于 2021 年 12 月建成投产。

The planned installed capacity is 1.4 GW. The No. 3 project with installed capacity of 0.3 GW was put into operation in December 2021.

#### 江苏盐城海上风电基地 Yancheng Offshore Wind Power Base in Jiangsu

规划装机容量 80 万千瓦。其中滨海北 H1 项目装机 10 万千瓦，于 2016 年 5 月建成；滨海北 H2 项目装机 40 万千瓦，于 2018 年 6 月建成；滨海南 H3 项目装机规模 30 万千瓦，于 2020 年全容量并网。

Planned installed capacity: 800 MW, including 100 MW for Binhai North H1 project that was completed in May 2016, 400 MW for Binhai North H2 project that was completed in June 2018, and 300 MW for Binhai South H3 project that was fully connected to the grid in 2020.

#### 广东沿海海上风电基地 Offshore Wind Power Base in Guangdong

“十四五”规划投产 320 万千瓦，基地配套建设一座通用码头。2021 年已建成投产 91.5 万千瓦，2022 年投产 50.2 万千瓦，2023 年投产 13.9 万千瓦。

Planned capacity: 3.2 GW, including 0.92 GW, 0.50 GW, and 0.14 GW that were put into operation in 2021, 2022 and 2023 respectively. A multi-purpose wharf is constructed in the Base.

## 推动能源清洁发展 Boosting Clean Energy Development

国家电投坚持以清洁能源为增量主体，2023 年，清洁能源开发力度、投资强度保持高位，持续优化电力装机结构，新能源占全年新增装机的 93%。截至 2023 年底，国家电投控股装机规模达到 2.37 亿千瓦，其中清洁能源装机 1.66 亿千瓦，清洁能源占比达到 69.89%。

SPIC always takes clean energy as its major growth drive. In 2023, sufficient development efforts to and investment in clean energy optimized the structure of our generation portfolio, with installed capacity of new energy accounting for 93% of the newly installed capacity throughout the year. As of the end of 2023, SPIC has posted the installed capacity up to 237 GW, with that of clean energy reaching 166 GW, a share of 69.89%.

### 光伏产业

### PV Industry



国家电投持续深入贯彻落实习近平总书记重要指示精神，全力打造世界一流光伏产业，开启由规模增长向质量优化转变的道路。2023 年 7 月，国家电投发布《建设世界一流光伏产业宣言（2023）》；承办全国光伏产业最高水平的建功平台和首次面向光伏产业领域举办的全国性职工职业技能竞赛——首届全国光伏职业技能竞赛暨全国大型光伏场站劳动竞赛。截至 2023 年 12 月底，国家电投光伏控股装机 6918.75 万千瓦，连续 8 年保持世界第一。

Upholding the important guidelines of President Xi Jinping, SPIC is committed to fostering a world-class PV industry by embarking on a journey of transformation from scale growth to quality optimization. In July 2023, SPIC released the Declaration on *Building a World-Class Photovoltaic Industry (2023)*, and hosted the First National PV Vocational Skill Competition and National Large-scale PV Station Labor Competition. This event served as the top-level competition platform in the PV industry, and was the first of its kind in China. As of the end of 2023, SPIC has registered the PV installed capacity of 69.19 GW, and remained the global top spot for 8 consecutive years.



国家电投四川兴川实证光伏电站平均海拔约 4000 米，填补了我国光伏实证基地在超高海拔、中纬度地区的空白，是全球首个超高海拔光伏实证实验基地项目

SPIC Xingchuan Demonstration PV Power Station in Sichuan at the average altitude of 4,000 m is the world's first ultra-high altitude PV demonstration experimental base, filling the gap of PV demonstration bases in ultra-high altitude and mid-latitude areas in China

### 风电产业

### Wind Power Industry



国家电投坚持集中与分散开发利用并重的原则，稳步推进风电产业进入第一梯队，海上风电保持行业领先。截至 2023 年底，风电总装机 5089.10 万千瓦，位居全球第二位，发电量 985.23 亿千瓦时。

Giving equal importance to centralized and decentralized development and utilization of wind power, SPIC steadily pushes forward with upgrading the wind power industry to the first-echelon industry, and maintains the leading position in the offshore wind power industry. As of the end of 2023, our installed capacity of wind power has amounted to 50.89 GW, ranking SPIC the second place globally, and wind power generation has hit 98.52 TWh.

### 全国装机规模最大的高原风电基地在云南曲靖建成并网

The largest plateau-based wind power base in China was completed and connected to the grid in Qujing, Yunnan



2023 年 5 月 8 日，作为全国装机规模最大高原风电基地的云南国际富源西风电项目在云南曲靖市全容量并网。该项目总装机规模 80 万千瓦，安装 135 台风机，分 3 期建成。该项目是云南省第一个智慧化、智能化、环境友好型风电场，还在全国首创运用各类智能传感器设备全方位采集数据，实现发电设备远程监视控制和预警。截至 12 月底，该项目累计发电超 8.67 亿千瓦时，等效减少标煤消耗约 35 万吨，减排二氧化碳约 86.44 万吨、二氧化硫约 2600 吨，持续提供就业岗位 150 余个，每年为地方新增税收 1 亿元。

On May 8, 2023, the Fuyuan West Wind Power Project of Yunnan International, the largest plateau-based wind power base in China, was fully connected to the grid in Qujing, Yunnan. The project is equipped with 135 wind turbines, with total installed capacity of 800 MW, and was built in three phases. It is the first smart, intelligent, and environmentally-friendly wind farm in Yunnan Province, and the first project in China to collect data comprehensively with smart sensors, allowing remote monitoring, control, and warning of power generation equipment. As of the end of 2023, the project has generated over 867 GWh, which cuts standard coal consumption by 350,000 tons, thus reducing carbon dioxide emissions by 864,400 tons and sulfur dioxide emissions by 2,600 tons. Besides, it has offered more than 150 jobs, and paid RMB 100 million worth of tax annually to the local government.



国家电投广东湛江徐闻海上风电场项目获 2022—2023 年度国家优质工程奖金奖

SPIC Xuwen Offshore Wind Farm Project in Zhanjiang, Guangdong won the Gold Prize of 2022-2023 National Quality Engineering Awards

## 水电产业

## Hydropower Industry



国家电投按照国家“流域、梯级、滚动、综合”的开发方针，以黄河上游流域、湖南沅水流域为重点，有序推进流域梯级水电站的开发建设。截至 2023 年底，水电总装机 2552.28 万千瓦，发电量 707.32 亿千瓦时。

In accordance with the state's principle of cascade, progressive and comprehensive development by one owner in the same basin, SPIC boosts the development and construction of cascade hydropower stations mainly on the upper basin of the Yellow River and the basin of Yuanshui River in Hunan. As of the end of 2023, the installed capacity of hydropower has totaled 25.52 GW, and power generation has measured 70.73 TWh.

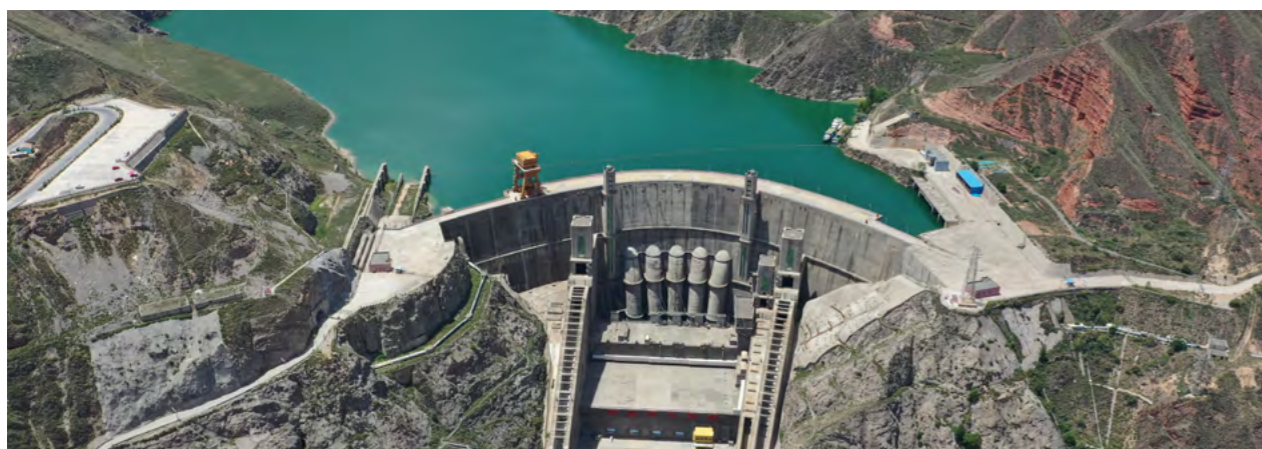
### 世界最大双排机布置水电站在青海尖扎全容量并网

The world's largest hydropower station with double-row units was fully connected to the grid in Jianzha, Qinghai



2023 年 10 月 10 日，黄河公司李家峡水电站 5 号机组投产发电，标志着我国首座采用双排机布置的、也是世界最大双排机布置的大型水力发电站——李家峡水电站实现 200 万千瓦全容量投产。李家峡水电站大坝坝高 165 米，坝基最宽处达 45 米，坝顶宽仅 8 米。由于坝址所在地峡谷过于狭窄，规划的 5 台 40 万千瓦的机组选择了双排机组厂房布置。李家峡水电站 5 号机组扩机工程是青海省、国家电投重点建设项目和海南州特高压外送基地电源配置的重要组成部分，将为保障“青豫直流”特高压外送通道的安全性、稳定性、经济性和助力构建新型能源体系作出重要贡献。

On October 10, 2023, Unit 5 in the Lijiaxia Hydropower Station of SPIC Huanghe Hydropower Development was put into operation completely, with full capacity of 2 GW. This station is the first large-scale hydropower station with a double-row arrangement in China, and also the world's largest hydropower station featuring double-row units. The dam of the station is 165 m high, 45 m wide in the widest part of its foundation, and only 8 m wide on the top. Considering that the canyon where the station is located is excessively narrow, the five 400 MW units are arranged in two rows. The expansion project of Unit 5 in the station is a major construction project of SPIC in Qinghai Province, and also an important part of the UHV transmission base in Hainan Prefecture. It will make important contributions to ensuring the safe, stable and cost-effective UHV DC transmission from Qinghai to Henan, and facilitating the establishment of a new energy system.



国家电投青海李家峡水电站  
SPIC Lijiaxia Hydropower Station in Qinghai

## 火电产业

## Thermal Power Industry



国家电投致力于火电清洁发展，持续推进超低排放，降低火电机组供电煤耗，2023 年，煤电超低排放改造机组 6 台，容量 82.4 万千瓦，累计完成改造 171 台，占火电机组总容量的 95.90%；供电煤耗 293.34 克 / 千瓦时，火电机组脱硫装备率 100%，火电机组脱硝装备率 100%。

SPIC is committed to the clean development of thermal power. To this end, initiatives are taken to promote ultra-low emissions, and minimize coal consumption of thermal power units. In 2023, we completed the ultra-low emission transformation of 6 coal power units, with capacity of 824 MW, which increased the total number of transformed units to 171, accounting for 95.90% of the total capacity of thermal power units. The coal consumption for power supply was 293.34 g/kWh. The desulfuration and denitration rates of thermal power units were both 100%.



国家电投上海漕泾电厂  
SPIC Caojing Power Plant in Shanghai



国家电投安徽平圩电厂  
SPIC Pingwei Power Plant in Anhui

## 核电产业

## Nuclear Power Industry



国家电投以第三代非能动核电产业链及研发、设计、工程建设、关键设备制造、运营和寿期服务能力，安全、高效推进核电项目建设，是中国三代核电投资运营商之一。截至 2023 年底，核电总装机 921.27 万千瓦，发电量 693.85 亿千瓦时。

As a third-generation nuclear power investor and operator in China, SPIC has the third-generation passive nuclear power industry chain, and boasts R&D, design, project construction, key equipment manufacturing, operation and life-cycle service capabilities. Thus, it is able to advance the construction of nuclear power projects safely and efficiently. As of the end of 2023, the total installed capacity of nuclear power has reached 9.21 GW, and power generation has registered 69.39 TWh.

### 我国实现三代核电 AP1000 主泵供电可靠性重大突破

China has achieved a major breakthrough in power supply reliability of AP1000 reactor coolant pumps for third-generation nuclear power



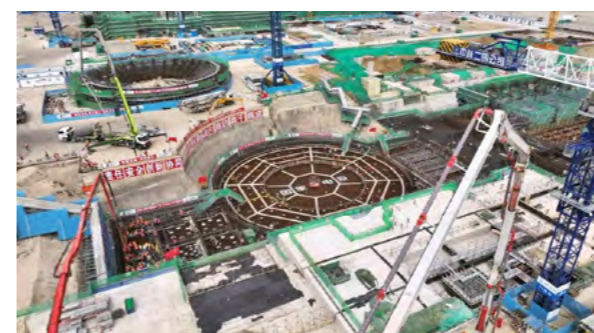
2023 年 10 月 7 日，海阳核电 2 号机组在完成主泵变频器“四用一备”可靠性提升工程试验后达到满功率运行状态，标志着海阳核电 2 号机组成为我国 AP1000 首台具备主泵变频器备用切换能力的机组，三代核电主泵供电可靠性取得重大突破。该变频器由山东核电、上海核工院联合国内制造厂家设计研发，具有中国自主知识产权，有效解决了主泵变频器可靠性不足的难题，实现了控制器在线维护及回切功能，各项指标完全满足现场安全运行需求。10 月 28 日 12 时 30 分，海阳核电一期工程 1、2 号机组累计发电量突破 1000 亿度，等效节约原煤消耗 4275 万吨，减排二氧化碳 8000 万吨，有效改善了区域能源结构和生态环境。

On October 7, 2023, Unit 2 in Haiyang Nuclear Power Plant reached full-power operating state after passing the reliability improvement test for the frequency converters of the reactor coolant pumps including four for use, and one for standby. This unit has become the first AP1000 unit enabling switching between the frequency converter of the reactor coolant pump in use and that for standby in China, marking a major breakthrough in power supply reliability of reactor coolant pumps for third-generation nuclear power. The frequency converter mentioned was designed and developed by Shandong Nuclear Power, and Shanghai Nuclear Engineering Research and Design Institute in conjunction with domestic manufacturers, with independent intellectual property right. It effectively addresses insufficient reliability of frequency converters for reactor coolant pumps, and enables online maintenance and fallback of controllers. All its indicators fully meet the requirements of safe operation on site. At 12:30 on October 28, the cumulative power generation of Units 1 and 2 in the Phase I Project of Haiyang Nuclear Power Plant exceeded 100 TWh. It reduced 42.75 million tons of raw coal consumption, and cut carbon dioxide emissions by 80 million tons, thus effectively improving the regional energy structure and ecological environment.



国家电投山东海阳核电一期工程 1、2 号机组  
Units 1 and 2 in the Phase I Project of SPIC Haiyang Nuclear Power Plant in Shandong

### 国家电投山东海阳核电 4 号机组和广东廉江核电 1 号机组开工 Unit 4 for SPIC Haiyang Nuclear Power Plant in Shandong, and Unit 1 for Lianjiang Nuclear Power Plant in Guangdong started construction



国家电投山东海阳核电 4 号机组浇筑核岛第一罐混凝土 (FCD)  
FCD for Unit 4 of SPIC Haiyang Nuclear Power Plant in Shandong



国家电投广东廉江核电 1 号机组核岛反应堆第一罐混凝土浇筑 (FCD)  
FCD for Unit 1 of Lianjiang Nuclear Power Plant in Guangdong

## 绿色低碳运营

天更蓝、山更绿、水更清、环境更优美，美丽中国的画卷正徐徐铺展。国家电投贯彻落实习近平生态文明思想，大力推进绿色低碳运营，守护碧水蓝天，融入美丽中国建设之中，为做好碳达峰碳中和工作贡献力量。

## Green and Low-carbon Operation

China is seeing bluer sky, greener mountains, clearer water, and more beautiful environment. Adhering to the ecological civilization thought of President Xi Jinping, SPIC has redoubled efforts to green and low-carbon operation, and engage in the Beautiful China Initiative in order to protect clear water and blue sky, and make contributions to dual carbon goals.

## 完善环境管理 Improving Environmental Management

国家电投全面落实生态环境保护主体责任，按照国家生态环境保护法律法规，制定印发《国家电力投资集团有限公司总部全员生态环境保护责任制》，明确生态环保“保证、监督、支持”三大体系定位，及各岗位生态环境保护职责和到位标准，实现公司总部岗位生态环境保护责任全覆盖；完善生态环保管理制度体系，修编《生态环境保护管理工作规定》等各项管理制度，建立运转有效的工作机制，按要求制定生态环保规划和工作计划，并按计划开展生态环保专项督查和日常检查，推进生态环保管理水平持续提升；扎实开展生态环保培训，并首次举办生态环境保护处级领导干部培训班，重点对国家生态环保法律法规、政策规定，公司生态环保规章制度和管理要求进行系统培训，讲解生态环保重点问题和典型案例，交流分享生态环保管理实践。2023年，国家电投全年未发生生态环保严重违法违规及突发环境事件。

SPIC stays committed to fulfilling its responsibility for ecological environment protection. To this end, the Company has formulated and released the *Responsibility System for Ecological Environment Protection of All Employees in SPIC Headoffice* in accordance with national ecological environment protection laws and regulations. This document outlines the three major systems of guarantee, supervision, and support for ecological environment protection, and the ecological environment protection duties and fulfillment criteria for all posts in the headoffice. Besides, the Company has refined the institutional system of ecological environment protection by formulating and revising management regulations such as the *Work Rules on Ecological Environment Protection Management*, established the effective work mechanism, worked out ecological environment protection plans and work plans as required, and carried out dedicated supervisions and routine inspections of ecological environment protection as planned in order to improve ecological environment protection management constantly. In addition, the Company has made solid efforts to ecological environment protection training, especially that for department-level leading cadres. The training sessions mainly cover national laws, regulations, and policies of ecological environment protection, as well as in-house rules, regulations and management requirements in this field. In these training sessions, trainees may learn major issues of ecological environment protection and typical cases, and share management practices in this field. In 2023, SPIC did not have serious violations of laws and regulations, and emergent environmental incidents in ecological environment protection.

国家电投新疆阿勒泰地区吉木乃风电场  
SPIC Jimunai Wind Farm in Altay, Xinjiang

## 推进节能降耗 Boosting Energy Conservation and Consumption Reduction

国家电投全面落实发电企业节能环保主体责任，依据《中华人民共和国节约能源法》《中央企业节约能源与生态环境保护监督管理办法》，建立健全节能环保管理体系，完善节能环保管理制度，修编公司《节能管理办法》《生态环境保护管理工作规定》等各项节能环保管理制度，明确相关部门管理职责，以节能精细化管理和新技术应用为抓手，多措并举推进节能降耗，推进公司各产业节能环保精细化管理水平持续提升。2023年，能源消耗强度为293.34克/千瓦时，水资源消耗强度为1.513千克/千瓦时，循环用水总量占总耗水量比例为97.99%。

SPIC devotes itself to fulfilling its responsibility for energy conservation and environmental protection as a power generation enterprise. To achieve this goal, we have established and improved the management system of energy conservation and environmental protection, and refined management regulations in this field in accordance with the *Energy Conservation Law of the People's Republic of China*, and the *Measures for the Supervision and Administration of Energy Conservation and Ecological and Environmental Protection by SOEs*. In particular, we have formulated and revised multiple management regulations concerning energy conservation and environmental protection, such as the *Management Measures for Energy Conservation*, and the *Management Regulations on Ecological Environmental Protection*. As specified in these documents, competent departments should fulfill their respective duties, fine management and new technology in energy conservation should be applied, combined energy conservation and consumption reduction measures should be taken in order to step up fine management in this field continuously. In 2023, energy consumption intensity was 293.34 g/kWh, and water resource consumption intensity 1.51 kg/kWh, recycled water consumption accounted for 97.99% of total water consumption.

### 扎实做好能源资源管理，全面提升节能降耗水平

**水资源使用管理：**制定并实施水资源使用管理措施，推进企业用水系统集成优化，鼓励串联用水、分质用水，实现一水多用和梯级利用；完善节水管理制度，建立智慧用水管理平台，开展工业废水循环利用试点示范，加强工业废水处理回用；开展水平衡测试、用水绩效评价和水效对标行动，引导企业实施节水改造。

**物料使用管理：**制定并实施物料使用管理措施，调整生产设备运行参数至最佳值，确保物料高效利用，配备能够满足生产统计量需要的计量器具，并定期开展校验与维护工作，建立健全物料管理台账，按期归档留存。

**能源使用管理：**制定并实施能源使用管理措施，组织开展节能管理指标体系建立、重点用能单位节能管理人员配置、高耗能设备替代等节能规范化管理工作，完善节能管理职责分工，明确新建项目、存量项目节能技改合规性要求，打造节能示范标杆。

**其他自然资源管理：**积极响应国家自然资源保护政策，促进建设用地集约利用，提升海洋资源集约利用水平，推动矿产资源高效利用，推动林业资源可持续利用，推进矿山修复与丘陵山地生态系统保育，加强河湖湿地生态保护与修复，强化海岸滩涂湿地生态保护修复。



Managing energy resources effectively, and enhancing energy conservation and consumption reduction comprehensively

**Water use management:** Formulate and implement measures to manage the use of water resources, integrate and optimize water-consuming systems, and encourage water use in series manner and by water quality in order to enable multiple uses of water and cascade utilization; refine water conservation management regulations, establish the smart water use management platform, and carry out pilot industrial wastewater recycling projects in order to facilitate the extensive reuse of industrial wastewater after treatment; conduct water balance testing, water use performance evaluation, and water efficiency benchmarking to guide enterprises to engage in water-saving transformation.

**Material use management:** Formulate and implement measures to manage material use, set the operating parameters of production equipment to optimal values to ensure the effective use of materials, allocate measuring instruments that meet production statistics and measurement needs, conduct calibration and maintenance regularly, as well as establish, improve and archive material management records.

**Energy use management:** Formulate and implement measures to manage energy use; establish the energy conservation management indicator system, assign energy conservation management personnel for key energy-consuming entities, and phase out energy-extensive equipment for standardized energy conservation management; improve the division of duties in energy conservation management; clarify the compliance requirements for energy-saving technical transformation of new projects and existing projects to build energy conservation benchmarks.

**Natural resource management:** Align with the national policies of natural resource conservation actively, facilitate the intensive use of construction land, step up the intensive use of marine resources, promote the efficient use of mineral resources, boost the sustainable use of forestry resources, propel mine reclamation and ecosystem conservation of hills and mountains, and reinforce wetland ecological protection and restoration of rivers, lakes, and intertidal zones along the coast.

## 加强污染防治 Strengthening Pollution Prevention and Control

严格遵守《中华人民共和国大气污染防治法》《中华人民共和国水污染防治法》《中华人民共和国固体废物污染环境防治法》等环保法律法规，制定公司《煤电机组超低排放改造 2023—2025 年行动方案》，有序推进火电超低排放改造；积极做好生物质和垃圾发电机组烟气治理达标升级改造，推进绿色花园式垃圾示范电站建设；加强物料运输、装卸、储存、转移过程及备料环节无组织排放治理，重点落实大气无组织排放治理相关措施；按照“雨污分流、清污分流”要求，推动废水、雨水系统改造，强化废水分级处理、深度回用；加大固体废物贮存场治理力度，规范危险废物管理，建立危险废物识别、申报、登记、储存、转移全过程管理机制，将危险废物纳入应急管理体系，严格按照最新要求监督危险废物全过程管理。

国家电投铝业公司整装待运的铝锭产品  
SPIC Aluminum and Power Investment's Aluminum Ingot Products Are Ready for Shipment

We have taken great efforts to strengthen pollution prevention and control: Observe applicable laws and regulations, such as the *Atmospheric Pollution Prevention and Control Law of the People's Republic of China*, the *Water Pollution Prevention and Control Law of the People's Republic of China*, and the *Law of the People's Republic of China on the Prevention and Control of Environment Pollution Caused by Solid Wastes*, and introduce the internal 2023-2025 *Action Plan for Ultra-low Emission Transformation of Coal Power Units* to advance ultra-low emission transformation of thermal power; work hard on the treatment upgrading and transformation of flue gas arising from biomass energy and waste to energy plants to meet treatment standards, and facilitate the construction of green garden-style demonstration power stations for waste disposal; strengthen the control of unorganized emissions from material transportation, loading/unloading, storage, transfer and preparation, especially the control of unorganized emissions to the atmosphere; drive the transformation of wastewater and rainwater systems, strengthen graded wastewater treatment and intensive reuse in accordance with the requirements of “separation of rainwater and sewage, and separation of clean water and sewage”; step up the management of solid waste storage yards, standardize the management of hazardous waste, establish the full-process management mechanism for hazardous waste identification, declaration, registration, storage, and transfer, include hazardous waste in the emergency management system, and supervise the full-process management of hazardous waste pursuant to the latest requirements.

### 绿电的新“铝”途 Green Power for New Aluminum Production



内蒙古公司霍煤鸿骏铝业公司 2017 年建设首例电解铝烟气污染物超低排放示范项目，实现氟化物排放浓度约 0.046 毫克 / 立方米、较国家排放标准降低 65 倍，二氧化硫排放浓度约 6.73 毫克 / 立方米、较国家排放标准降低 30 倍。铝电解烟气污染物的超低排放成就了多项全国之最，代表了全国乃至全球铝业清洁生产最高水平。2023 年，在全国首批“绿电铝”产品认证中，霍煤鸿骏铝业公司完成了 8.6 万吨重熔用铝锭、9.9 万吨电解原铝液认证，大比例的绿电转化为“绿电铝”，让铝业变为“绿业”。与此同时，霍煤鸿骏铝业公司还与 3 家下游企业达成销售协议，2023 年累计完成“绿电铝”交易 3.65 万吨，实现绿色发电到“绿电铝”消费的产业链价值传递。

In 2017, SPIC Huomei Hongjun Aluminum Power Company in Inner Mongolia Company built the first flue gas pollutants ultra-low emission demonstration project for aluminum smelters. This project reduces fluoride emission concentration to 0.046 mg/m<sup>3</sup>, 65 times lower than the national emission standard, and sulfur dioxide emission concentration to 6.73 mg/m<sup>3</sup>, 30 times lower than the national emission standard. It has set multiple national records, and is recognized as the highest level of clean production and environmental protection in the aluminum industry in China and even the world. In the certification of the first batch of “green power aluminum” products in China, this company obtained certificates for its 86,000 tons of aluminum ingots for remelting and 99,000 tons of aluminum liquid in 2023. A great share of green power has been applied to produce green aluminum, turning the aluminum industry into a green industry. In addition, the company reached sales agreements with 3 downstream enterprises, and sold 36,500 tons of green power aluminum in 2023, realizing the value transfer of the industry chain from green power generation to green power aluminum consumption.

## 关注气候变化

作为首个提出碳达峰目标愿景的能源央企，国家电投高度重视全球气候变化，2023 年度，温室气体减排投资 11964 万元；与中国国际经济交流中心共同举办“《中国碳达峰碳中和进展报告（2023）》发布暨‘碳达峰碳中和’研讨会”，以共商服务“双碳”之计；主办 2023 国际能源变革论坛分论坛“2023 年亚洲绿色低碳发展圆桌论坛”，联合主办 COP28 “清洁能源促进绿色转型”中国角边会，为全球气候治理贡献力量，国家电投苏州综合智慧零碳电厂、庄上村光储直柔直流微网项目荣获第 28 届联合国气候变化大会（COP28）“能源转型变革者”奖项；入选“企业绿色低碳领先指数”30 强。

## Concern for Climate Change

As the first energy SOE proposing the vision of peaking its carbon emissions, SPIC attaches great importance to global climate change. In 2023, we earmarked RMB 119.64 million for greenhouse gas emission reduction. SPIC and China Center for International Economic Exchanges co-organized the Release of the *Report on the Peak Carbon Emission and Carbon Neutrality (2023)* and the “Carbon Peak and Carbon Neutrality” Seminar to pool wisdom for dual carbon goals. Besides, we hosted the 2023 Asia Green and Low-carbon Development Roundtable during the International Forum on Energy Transition, and co-hosted the COP28 China Pavilion themed at “Clean Energy Promotes Green Transformation” to contribute to global climate governance. SPIC Suzhou Smart Energy Prosumer (SEP) and Zhuangshang Village PV Power Storage and DC Flexible Transmission Micro-grid Project won the COP28 “Energy Transition Changemaker” awards. In addition, we were selected among Top 30 of the “Enterprise Green and Low-Carbon Leading Index”.

## 打造清洁总部 Building A Clean Headoffice

把国家电投总部大楼作为试验田，打造“清洁、低碳、智慧”楼宇项目，每年自发自用绿色电能 30 万千瓦时，年节电 60 万千瓦时，减少二氧化碳排放约 729 吨，通过“自发自用绿电+认购非补贴光伏项目绿证”的方式，实现了全年用电 100% 绿色化。

We have upgraded our buildings in the headoffice in clean, low-carbon and smart manner. This pilot project will generate and consume 0.3 GWh green power every year, saving 0.6 GWh power consumption annually, and reducing carbon dioxide emissions by 729 tons. 100% green power consumption has been achieved through “green power self-generation and consumption + RECs purchase from non-subsidized PV power projects”.

## 提升管碳能力 Enhancing Carbon Management Capabilities

以全面系统思维做好降碳，积极开展全口径碳足迹管理，是首个完成全口径组织碳足迹核算的国资央企；主动培育“能算、能认、能减”的一体化“双碳”服务能力，建设服务地方政府和企业能源和碳排放动态监测、分析平台，解决碳排放管理痛点。2023 年，国家电投智慧能投实现对农产品碳排放信息的量化与认证，核算并落地全国红枣产业和河北省农产品的首个产品碳标签认证证书——天农产品“木兰红”枣仁派产品“碳标签”，为全力支持乡村振兴打造新模式。

SPIC is committed to carbon emission reduction in holistic and systematic manner, and unified carbon footprint management, as the first central SOE completing unified carbon footprint accounting. We develop the “dual carbon” service capabilities of carbon accounting, identification and reduction, and build the dynamic monitoring and analysis platform of energy and carbon emissions dedicated to local governments and enterprises to address the challenges of carbon emission management. In 2023, SPIC Smart Energy Investment realized the quantification and certification of carbon emission information for agricultural products. The company conducted carbon accounting, and issued the first carbon label certificate in the national red date industry and among agricultural products in Hebei Province, namely, “Carbon Label” certificate for the “Mu Lan Hong” red date pie products of Tiannong Fruit Collective. This is new model to support rural revitalization vigorously.

## 开发减碳技术 Developing Carbon Reduction Technologies

加快低碳零碳负碳能源技术研发，布局 CCUS（碳捕集、利用与封存技术）全产业链，协同产业链上下游打造绿色价值链。

We are dedicated to accelerating the research and development of low-carbon, zero-carbon and negative-carbon energy technologies, engaging in the whole CCUS (carbon capture, utilization and storage technology) industry chain, and coordinating the upstream and downstream of the industry chain to build a green value chain.

### 我国首套 10 万吨级燃煤燃机全流程 CCUS 装备在上海崇明投入商运

The first 100,000-ton full-process CCUS equipment for the coal-fired power plant (to be converted to gas turbine) in China was put into commercial operation in Chongming, Shanghai



2023 年 2 月 16 日，由远达环保承建的上海电力长兴岛热电 10 万吨级燃煤燃机全周期二氧化碳捕集与利用（CCUS）项目一期工程投入试运行。该项目是我国首套 10 万吨级兼容燃煤燃气烟气的碳捕集装置，也是我国最大的二氧化碳捕集用于焊接保护气体的 CCUS 全流程项目。项目一期于 2023 年 6 月底正式投入商业运行，截至 12 月底，累计供应二氧化碳近 5 万吨，经济社会效益显著。

On February 16, 2023, the first phase of the 100,000-ton Full-process CCUS Project for the Coal-fired Power Plant (to Be Converted to Gas Turbine) owned by Shanghai Electric Power in Changxing Island, undertaken by SPIC Yuanda Environmental Protection, was put into trial operation. This involves the first 100,000-ton CCUS equipment applicable to the flue gas from both coal-fired and gas-fired units in China and the largest CCUS full-process project in which carbon dioxide is captured and then used as shielding gas. The first phase of the project was put into commercial operation at the end of June 2023. As of the end of December, it has supplied nearly 50,000 tons of carbon dioxide in total, and brought significant economic and social benefits.

### 国家电投上海长兴岛电厂 CCUS 创新示范项目

The first 100,000-ton full-process CCUS equipment for the coal-fired power plant (to be converted to gas turbine) in China was put into commercial operation in Chongming, Shanghai

## 发力绿色金融 Driving Green Finance Development

充分发挥绿色金融作用，创新提升清洁能源的绿色、低碳价值，为清洁能源产业高质量发展提供绿色动能。

We give full play to green finance, innovate and enhance the green and low-carbon value of clean energy, and provide green momentum for the high-quality development of the clean energy industry.



国家电投完成全国首单央企新能源公募 REITs 的发行和上市（证券代码：508028），在类 REITs 领域创全市场规模最大发行纪录  
SPIC was the first to complete the issuance and listing of REITs in the new energy sector (stock code: 508028) in China, setting a record for the largest issuance in the quasi-REITs field

## 参与新兴市场 Participating in the Development of Emerging Markets

积极参与新兴市场建设，2023 年，国家电投完成全国温室气体自愿减排交易市场第一批交易；国家电投碳资产管理公司荣获全国首届全国碳排放权模拟交易竞赛“优秀交易表现奖”。

We actively engage in the development of emerging markets. In 2023, SPIC completed the first batch of transactions in the national voluntary greenhouse gas emission reduction trading market. SPIC Carbon Asset Management Company won the “Excellent Trading Performance Award” in the First National Emissions Simulation Trading Competition.

### 国家电投完成全国首例生物质发电参与电力现货市场交易和全国首笔生物质发电绿证交易

SPIC completed the first transaction concerning biomass power generation in the electricity spot market, and the first green certificate transaction of biomass power generation in China



2023 年 9 月 1 日，国能生物山东临沂、宁阳、惠民三台生物质发电机组，在国补新政出台后创新盈利模式，在山东电力交易中心顺利完成现货交易出清，当日出清溢价收益近 10 万元，开创了我国生物质发电参与电力现货市场交易的先河。

11 月 29 日，我国第一个国家级生物质发电示范项目——国能生物山东单县生物质发电机组通过生物质发电项目绿证核发审核，获得首批绿证核发，完成全国首笔生物质发电绿证交易。此次绿证交易，安徽省郎溪县鸿泰钢铁有限公司以单价 30 元 / 个购买了 100 个绿证用于企业生产绿电转型，获得了首个生物质发电绿色电力证书。

On September 1, 2023, SPIC National Bio Energy introduced a new business model for its three biomass power generation units in Linyi, Ningyang and Huimin, Shandong Province, after the release of the new national subsidy policy. This company successfully completed the spot transaction clearance at the Shandong Electric Power Trading Center, with the premium income on the same day of nearly RMB 100,000, which was a ground-break in the trading of biomass power generation in the electricity spot market. On November 29, the Biomass Power Generation Unit of SPIC National Bio Energy in Shanxian County, Shandong Province, the first national biomass power generation demonstration project in China, passed the review of green certificate issuance for biomass power generation projects, and was authorized to issue the first batch of green certificates. Then, it realized the first green certificate transaction of biomass power generation at home. In this green certificate transaction, Hongtai Iron Co., Ltd. in Langxi County, Anhui Province purchased 100 green certificates at a unit price of RMB 30 for its green power transformation, and obtained the first green power certificate of biomass power generation.

## 营造绿色风尚 Fostering Green Development Climate

上线全国首家央企碳普惠平台“低碳 e 点”，汇聚广泛降碳力量，截至 2023 年 7 月，已累计助力减少二氧化碳排放超过 8600 吨；在全国节能宣传周之际组织开展“低碳 e 点都不难”主题活动，设置低碳骑行、徒步活动、科普宣传等缤纷多彩的低碳参与，让低碳生活方式悄然入心；积极推广绿色办公，通过规范办公用品使用、倡导“双面用纸”“人走灯灭”“光盘行动”等绿色行动，避免“长流水”和“跑冒滴漏”等浪费资源的情况发生，增强员工绿色办公意识，鼓励员工从生产生活细节着手努力将绿色转变为生存发展底色。

SPIC is the first SOE to launch the national carbon inclusive platform “Lower Carbon” to pool carbon reduction forces. As of July 2023, this platform helped reduce carbon dioxide emissions by more than 8,600 tons. During the National Energy Conservation Week, we organize activities to encourage the public to engage in carbon emission reduction, such as cycling, hiking, and low-carbon knowledge popularization, and form a low-carbon life style. Furthermore, we actively advocate green office. To be specific, we have standardized the use of office supplies, taken green actions such as using paper in double-sided manner, lighting off when leaving the office, and engaging in the “empty plate” campaign, and prevented waste of resources, such as leaving the water tap open, or ignoring leaks. Our employees are encouraged to enhance green office awareness in both work and life.

# 02

## 品牌卓著

## 以负责任经营 诠释为民初心

以人为本，以国为怀。国家电投坚持把民生福祉和企业发展有机结合，在责任担当中展现新作为，悉心培育一流人才，扎实推动共同富裕，助力全球繁荣发展，铸强负责任的企业公民品牌形象。

### Remarkable Brand Responsible Operation for People-centered Aspiration

Putting people and country foremost, SPIC highlights people's wellbeing in corporate development, takes due responsibility while making new progress, cultivates first-class talent, plays its part in pursuing common prosperity and global prosperity, and builds its responsible corporate citizen image.



国家电投江西乐平鹧鸪高家光伏电站  
SPIC Gaojia PV Power Station in  
Leping, Jiangxi



国家电投山东海阳核电站  
SPIC Haiyang Nuclear Power Plant in Shandong

## 心系员工福祉

党的二十大报告指出：培养造就大批德才兼备的高素质人才，是国家和民族长远发展大计。国家电投充分尊重员工基本权益，精心构筑员工学习与晋升平台，努力营造平等、健康、轻松的工作氛围，与员工共创社会价值、共享发展成果。

## Commitment to Employee Wellbeing

As remarked in the Report to the 20<sup>th</sup> National Congress of the CPC, cultivating a large workforce of high-quality talent who have both integrity and professional competence is of critical importance to the long-term development of China and the Chinese nation. SPIC fully respects the basic rights and interests of employees, builds a learning and promotion platform for employees, fosters an equal, healthy and relaxing workplace, and creates social value and shares development results with employees.

## 保障员工权益

## Protecting the Rights and Interests of Employees

国家电投坚守合法用工的底线，坚持平等规范雇佣，不断完善薪酬福利体系和民主管理机制，与员工建立长期稳定的雇佣关系，维护好、保障好、发展好职工切身利益。

SPIC insists on legal, equal and standardized employment, continuously improves the remuneration and welfare system and the democratic management mechanism, builds long-term and stable relations with employees, and maintains, protects and develops the vital interests of employees.

2023 年

公司员工总数 **127514** 人

Total number of employees: **127,514**

劳动合同签订率达 **100%**

Labor contracts coverage: **100%**

## 合法平等雇佣 Legal and Equal Employment

严格遵守《中华人民共和国劳动法》《中华人民共和国劳动合同法》《中华人民共和国妇女权益保障法》《禁止使用童工规定》等法律法规。坚持以公开、公平、公正的原则招聘员工，严格审核应聘者的信息，杜绝非法用工；平等对待不同民族、性别和文化背景的员工，避免用工歧视；致力于吸纳不同背景及专业领域的优秀人才，实现公司发展的多元化和可持续性。

We observe the *Labor Law of the People's Republic of China*, the *Labor Contract Law of the People's Republic of China*, the *Law of the People's Republic of China on the Protection of Women's Rights and Interests*, and the *Provisions on the Prohibition of Using Child Labor*. Our employment is subject to the principles of openness, fairness and justice, and to the strict review of job-seekers' information in order to eliminate illegal employment. We equally treat employees of different nationalities, genders and cultural backgrounds, and free all employees from discrimination. Our efforts are focused on attracting outstanding talent from different backgrounds and areas of expertise to enable diversified and sustainable corporate development.

## 完善薪酬福利 Improving Remuneration and Welfare

深度践行人文关怀，按照国家关于薪酬管理的政策要求，规范开展薪酬福利管理，形成与劳动力市场基本适应、与企业经济效益和劳动生产率挂钩的工资决定和正常增长机制；健全人力资源数字化平台，实现薪酬福利信息自助查询，全面保障、维护员工权益。

Emphasizing employee caring, we practice remuneration and welfare management in accordance with the national policies on remuneration management, and form the proper pay package and pay-raise mechanisms that are basically adaptable to the labor market and linked to the profitability and labor productivity of the employer. Moreover, we refine the digital platform of human resources, allowing self-service inquiry of remuneration and welfare information in order to safeguard the rights and interests of employees.

## 推进民主管理 Advancing Democratic Management

坚持将党的领导、依靠职工办企业和依法治企有机统一，完善以职工代表大会为基本形式的民主管理制度，日益完善民主管理体系建设，不断提高企业民主管理工作水平，职代会覆盖率 100%；调动广大职工参与企业管理积极性，收集常态合理化建议 1803 条，办理落实 1105 条，有效激发职工参与热情。

We adhere to dependence on employees, and law-based governance. To be specific, we improve the democratic management system with the Employees' Congress as the fundamental form, and upgrade the democratic management framework to enhance democratic management. The coverage of the Employees' Congress has reached 100%. We arouse the enthusiasm of employees to participate in corporate management. During the reporting period, we collected 1,803 rationalization suggestions, and addressed 1,105 items.

## 建设“SPIC—家园” “SPIC - Employee Community” to Serve Employees Better

2020 年 4 月，为打通服务群众的“最后一公里”，建立“SPIC—家园”，架起企业与职工之间的“连心桥”。截至 2023 年 12 月，“SPIC—家园”累计传递各类信息 1200 余条、办理落实职工诉求建议 1300 余件。“SPIC—家园”登上工人日报、人民日报，广大干部职工对企业认同度满意度连年攀升。

In April 2020, SPIC proposed the “SPIC - Employee Community” initiative to solve the last mile problem of reaching out to our employees at the grass-root level and bridge the communication gaps. As of December 2023, “SPIC-Employee Community” transmitted more than 1,200 pieces of information, and responded to 1,300 suggestions and requests of employees. “SPIC - Employee Community” has been reported by Workers' Daily and People's Daily, and we have received increasing recognition and satisfaction from our employees year by year.

## 关心关爱员工 Caring for Employees

奋斗者是精神最为富足的人，亦是最能感知幸福的人。国家电投将员工视为企业最宝贵的财富，积极通过关注员工职业健康、提供畅通的沟通反馈渠道、开展丰富多彩的关爱活动等，让员工可以时刻感受到企业温度，增强员工获得感、幸福感、安全感。

Hard workers boast the most spiritual richness, and are most likely to feel happy. Taking employees as its most valuable wealth, SPIC safeguards the occupational health of employees, provides smooth communication and feedback channels, and organizes a variety of caring activities to bring warmth to employees, and enhance their sense of gain, happiness and safety.

## 职业健康管理 Occupational Health Management

国家电投严格遵守《中华人民共和国职业病防治法》等法律法规，制定公司《职业健康和劳动保护管理办法》，各单位按照相关要求健全职业健康管理体系，建立职业健康风险数据库并在生产现场公示，严格落实职业病防护措施，开展职业危害因素监测、评价，为员工开展职业健康教育培训、职业健康体检并配备合格的劳动防护用品，定期向地方政府部门汇报本单位职业健康工作开展情况。2023 年，员工年度体检覆盖率与员工职业健康档案覆盖率均达 100%。

SPIC strictly abides by applicable laws and regulations, such as the *Law of the People's Republic of China on Prevention and Control of Occupational Diseases*, and has formulated the *Management Measures for Occupational Health and Labor Protection*. All its subsidiaries and affiliates refine their occupational health management systems in accordance with requirements, establish and release occupational health risk databases on production sites, implement occupational disease prevention measures, carry out monitoring and evaluation of occupational hazards, arrange occupational health training sessions and occupational health examinations for employees, and equip them with qualified labor protection supplies, and regularly report occupational health work progress to local government departments. In 2023, all employees received physical examinations, and had occupational health archives.

## 工作生活平衡 Balance the Work and Life

国家电投广泛开展各类形式多样、内容丰富的文体活动，每年举办“建功创一流”乒乓球、羽毛球、篮球等体育竞赛，助力员工实现“快乐工作、健康生活”。

SPIC organizes various recreational and sports activities, such as table tennis, badminton, and basketball competitions, to help employees work and live happily and healthily.

## 加强人文关怀 Strengthening Employee Caring

发布公司《特困职工帮扶工作管理办法》《“3+2+2”员工关心关爱工作法》，完善员工关心关爱工作机制；发挥“心能源”平台作用，通过现场讲座、咨询电话、心理测评、私信沟通等多种形式，加强职工心理健康关爱，2023 年达到 72893 使用人次。持续开展“我为群众办实事”，多措并举用心践行新时代群众路线，全心全意为员工办实事，2023 年，各二级单位“实事”办理落实 715 件，用心尽力解决职工“急难愁盼”；2023 年春节期间，公司领导开展新春慰问，通过现场或视频的方式，看望慰问了劳动模范、优秀党员、海外员工（以视频方式向奋战在境外一线的 24 家境外机构和项目共 250 多名员工送去了温暖）、生活困难员工等，把公司的关怀与问候送到员工身边。

The Company has released the *Management Measures for Helping Employees in Exceptional Difficulties* and the *“3+2+2” Employee Caring Approaches* to improve the employee caring mechanism. We care for the mental health of employees through various forms such as on-site lectures, consulting hotline, psychological assessments, and private communication. In 2023, we received 72,893 online and offline visits. We continue to take combined measures to bring tangible benefits to employees. In 2023, our subsidiaries and affiliates tackled 715 urgent and difficult issues and concerns of employees. During the Chinese New Year in 2023, SPIC's leaders visited and remotely expressed greetings to model workers, overseas employees (giving New Year's greetings to 250 front-line employees working for 24 overseas companies and projects via the video), and employees with difficulties in life.

## 助力员工成长 Helping with Employees' Growth

人才为兴邦之本，人才乃成事之基。国家电投坚持把人才工作摆在重要位置，坚持人才强企战略，打通各类人才发展通道，为员工提供加速发展、稳步前行的平台，为做强做优做大国有企业提供坚实的人才保障。2023 年，国家电投 6 个青年集体获评全国青年文明号。

Recognizing that talent is the cornerstone of prosperity and success, SPIC always implements the strategy of strengthening the enterprise through talent. Prioritizing talent development, the Company establishes multiple talent development channels, and offers a platform to help employees grow rapidly and progress steadily to lay solid talent foundation for SPIC to get stronger, do better, and grow bigger. In 2023, 6 youth groups of SPIC won the National Youth Civilization Award.

国家电投某党员攻坚先锋队在“国和一号”示范工程举行班前会  
SPIC Pre-shift Meeting at the "Guohe One" Demonstration Project



## 培育优秀人才 Cultivating Excellent Talent

国家电投持续优化一流队伍建设规划，完善“3+1+N”人才工作体系，不断加强重点领域、专业人才培养，2023年，员工培训总投入30745万元，员工培训参与人次778942人次，员工人均培训时长92.02小时。

SPIC keeps optimizing the development of first-class workforce. In particular, the Company improves the “3+1+N” talent system, and cultivates talent in key fields, and areas of expertise. In 2023, we invested RMB 307.45 million in employee training; the number of trainees totaled 778,942; the average length of training session per employee was 92.02 hours.

## 畅通职业通道 Establishing Smooth Career Development Channels

制定发布公司《员工职业发展管理办法》《领导人员选拔任用管理规定》等制度，形成了经营管理、专业技术、操作技能通道岗位阶梯设置，明确了通道转换机制和职级调整原则和条件等。

We have introduced and issued the *Management Measures for Employee Career Development and the Management Regulations for Selection and Appointment of Leaders*, formed tiered career development paths consisting of business administration, professionals, and skilled workers, and outlined the mechanism of switching between different paths and principles and conditions of job level adjustment.

## 提升技能素质 Improving Skills and Capabilities

发布产业工人队伍建设改革十大举措，明确了“122+211”工程目标；制定《高技能人才队伍建设方案》，搭建“新8级工”职业技能等级序列；建设国家电投工匠学院，加快培训基地建设。

We released ten major measures for the reform of industrial workers, and outlined “122+211” program goals; worked out the *High-skilled Talent Team Development Plan*, clarifying the new 8 levels of skilled workers; set up the Craftsman College, and accelerated the establishment of more training bases.

国家电投新疆能源化工四棵树煤炭公司八号井综掘队掘进一班获得2023年“全国工人先锋号”称号

The No. 1 Excavation Crew of the Well 8 Excavation Team for Sikesu Coal Company of SPIC Xinjiang Energy Chemical Industry was recognized the “National Worker Pioneer” in 2023

## 打造专业人才，塑造大国工匠 Cultivating professional talent, and consummate craftsmen



持续推进重点人才工程，实施新兴产业、核能、安全生产等专项人才计划，推进专业骨干人才库建设，2023年，建成人才库18个，在库人员3588名；构建综合智慧零碳电厂“零碳三角”人才配置模型，以湖北公司为试点单位打造人才样板间。

We continue to advance key talent programs, especially talent in emerging industries, nuclear energy, and work safety, and establish major professional talent pools. In 2023, 18 talent pools were built, with 3,588 members in total. We built a “triangle-type” talent allocation model for SEPs, and took SPIC Hubei Electric Power as a pilot company for SEP talent cultivation.



豆存印 国核设备生产技术部核级焊工  
Dou Cunyin  
Nuclear-grade Welder in the Production Technology Department of Shandong Nuclear Power Equipment Manufacturing

豆存印是长期工作在核电建设一线的焊接高级技师，他累计完成8万米焊缝、5.4万个部件的焊接工作，是国核设备自主培养的全国技术能手，27岁便被授予“全国技术能手”称号。2024年被授予“全国五一劳动奖章”。

Dou Cunyin is a senior welding technician working in the front line of nuclear power construction. He has welded 80,000 m joints and 54,000 components. Dou is a national technical expert independently trained by Shandong Nuclear Power Equipment Manufacturing. He was titled the “National Technical Expert” at the age of 27. In 2024, he was awarded the “National May 1 Labor Medal”.



李章金 内蒙古公司白音华蒙东煤业公司车间主管  
Li Zhangjin  
Workshop Supervisor of Baiyinhu Mengdong Coal Company of SPIC Inner Mongolia Electric Power

“把平凡的工作做到极致就是最大的不平凡”是李章金的口头禅。自2010年大学毕业在白音华蒙东煤业公司工作以来，李章金十几年如一日，把工作做到极致。沉下心来干工作，心无旁骛钻业务，在平凡的工作岗位上孕育了不凡的工作业绩。获得2023年“大国工匠”称号。

“Doing ordinary job to perfection is the greatest extraordinary”. That is Li’s motto. Since graduation in 2010, Li has devoted himself to work in the company, making great achievements. In 2023, he was honored the “Master Craftsman”.

## 落实安全生产 Strengthening Work Safety

国家电投深入学习贯彻习近平总书记关于安全生产重要论述精神，认真落实党中央、国务院决策部署，坚持人民至上、生命至上，以恒久核安全助力全球核安全命运共同体，切实筑牢安全生产基础，完善全员安全责任制，推进双重预防机制建设，加强安全生产队伍建设，持续提升安全管理效能，推进本质安全型企业建设，持续增强能源安全保障能力，助力能源安全与可持续发展。

SPIC upholds the important work safety guidelines of President Xi Jinping, and implements the decisions and policies of the State Council. Adhering to the people-first and life-first principles, we play our part in global community of shared future on nuclear safety. Efforts have been made to build a solid foundation for work safety, improve the safety responsibility system for all employees, promote the development of a dual prevention mechanism, strengthen the cultivation of work safety teams, enhance safety management efficiency, boost the development of an intrinsically safe enterprise, and step up energy security guarantee capabilities to contribute to energy security and sustainable development.

## 绝无一失 严守核电安全 Ensuring Nuclear Power Absolutely Safe

核安全是国家安全的重要组成部分，是核事业发展的生命线。国家电投严格贯彻落实《中华人民共和国核安全法》，坚持“理性、协调、并进”的核安全观，切实筑牢核安全屏障，将核电安全置于最高优先级。持续完善核安全管理体系，发布《核电厂安全质量总监派驻方案》，启动核电厂全面提升核安全管理专项行动，完善“两个零容忍”制度程序体系，做好核电项目风险管控；做强核应急支援基地、做好支援队伍能力建设，邀请行业专家对公司核应急支援体系和能力建设进行评估，并通过专题会议研究支援能力提升措施，制定公司核应急支援基地与支援队伍建设优化方案，积极推进核安全文化建设，开展核安全震撼教育，组织核安全重要事件“回头看”活动。2023年，WANO指标保持卓越值，核能产业实现全年“零死亡”目标。

Nuclear safety is an important part of national security and the lifeline of nuclear industry development. SPIC observes the Nuclear Safety Law of the People's Republic of China, takes firm stand in the rational, coordinated and balanced nuclear safety strategy, and forges a nuclear safety shield, considering nuclear power security as the top priority. We continue to refine the nuclear safety management system, issue the *Assignment Plan of Security and Quality Directors to Nuclear Power Plants*, launch the special action to build up nuclear safety management in nuclear power plants, improve the system of “two zero tolerance” regulations and procedures, and do a good job in risk control of nuclear power projects. We strengthen the development of nuclear emergency support bases and capabilities of support teams, invite industry experts to evaluate our nuclear emergency support system and capability development, discuss support capability improvement measures through special meetings, and formulate the optimization plans for nuclear emergency support bases and support teams. We actively promote the development of nuclear safety culture, organize nuclear safety education, and conduct activities to look back important nuclear safety events. In 2023, SPIC's WANO indicators maintained at excellent levels, and the nuclear energy segment achieved the “zero death” goal.

## 计熟事定 夯实安全管理 Consolidating Safety Management with Deliberate Plans and Proven Actions

国家电投始终坚持贯彻落实《中华人民共和国安全生产法》《中央企业安全生产监督管理办法》，不断完善安全生产管理体系，压实全链条安全生产责任，落实安全督导检查，推进治本攻坚行动，持续筑牢企业高质量发展根基。

SPIC always abides by the *Work Safety Law of the People's Republic of China*, and the *Supervision and Administration Measures for Work Safety of SOEs*. Besides, we continuously improve the work safety management system, strengthen the work safety responsibility of the entire value chain, implement safety supervision and inspection, and take actions to tackle root causes to lay a solid foundation for high-quality development.

### ◎ 完善安全制度体系

遵照“贯穿全过程、覆盖全领域”思路，修订发布《安全生产工作规定》；按照“1+N”制度体系结构，修订完善《安全生产责任制管理办法》等11份制度。修订《电力安全工作规程》，推动建立覆盖全电力类型、全寿命周期的安全管理标准规范。

### ◎ Improve the safety management system

Revise and issue the *Regulations on Work Safety* following the principles of “highlighting work safety throughout the process and in all fields”; revise 11 documents of regulations, including the *Management Measures for Work Safety Responsibility*, in accordance with the “1+N” institutional structure. Revise the *Regulations on Electricity Work Safety* to facilitate the establishment of safety management standards and specifications covering all types of electricity generation facilities and throughout the project life cycle.

### ◎ 压实安全生产责任

完善全员安全责任制，推动各级人员履职尽责，建立公司领导班子安全生产齐抓共管任务清单。发布《新能源基层场站长责任人清单》《工程建设项目责任人清单》，着力打通安全生产责任落实“最后一公里”。

### ◎ Strengthen the work safety responsibility

Refine the safety responsibility system for all employees, urge employees at all levels to perform their duties, and establish a task list for the leading team to manage work safety. Issue the *List of Responsible Persons for Grass-roots New Energy Stations*, and the *List of Responsible Persons for Engineering Construction Projects* to fulfill work safety responsibility at the grass-roots level.

### ◎ 强化安全管理监督

聚焦较大问题及风险隐患，促进安全管理改进提升。推行二级单位自查自纠及反差率比对机制，促进全系统各层级管理体系发挥作用。主动适应业务创新，积极拓展监督范畴，逐步实现全产业类型、全业务流程安全监督全覆盖。

### ◎ Implement safety supervision and inspection

Boost the improvement of safety management targeting major problems, risks and hidden hazards. Implement the self-inspection and self-correction mechanisms of our subsidiaries and affiliates to give full play to management systems at all levels. Embrace business innovation, and expand supervision coverage to achieve full coverage of safety supervision in all industry types and all business processes.

国家电投广东廉江核电项目  
SPIC Lianjiang Nuclear Power Project in Guangdong

### ◎ 加强下游安全管理

发布实施《承包商安全管理过程事项及工作要求清单（1.0版）》，组织开展为期两个月的承包商专项排查整治，进一步规范“准入、选择、使用、评价”阶段关键管控措施；开发承包商安全管理功能模块，以“互联网+”带动安全管理。

### ◎ Step up downstream safety management

Release and implement the *List of Safety Management Matters and Job Requirements for Contractors (Version 1.0)*, organize a two-month targeted inspection and rectification activity among contractors, and further standardize the key control measures at the access, selection, use, and evaluation stages; develop contractor safety management function modules, and drive safety management based on “Internet+”.

## 绷紧紧弓 筑牢安全防线 Building Safety Capacity

国家电投牢固树立底线思维，统筹好发展和安全，加大关键环节管控力度，建立双重预防机制，强化隐患排查、风险整治和应急管理，持续推进科技兴安。2023年，公司聚焦重点环节开展11次专项设备隐患排查，共排查重点问题2333项。

SPIC firmly upholds the bottom line mindset, strikes a balance between development and safety, builds up the control of key links, establishes a dual prevention mechanism, strengthens identification of hidden hazards, risk rectification and emergency management, and applies more scientific and technological achievements for work safety. In 2023, the Company carried out 11 identification actions of equipment hidden hazards focusing on key links, figuring out 2,333 key issues.

## 沃土养根 增强安全素养 Enhancing Safety Competence

国家电投高度重视安全文化建设，按照“合规、分类、分级”的原则，系统制定公司全员安全生产培训方案，制作发布《施工反措三十条》宣教视频，制定实施《技术监督管理统筹资源实施方案》，开展5期技术监督专业培训，19期智享云课堂线上授课、9期“二十五”项反措线上解读，提升基层人员生产技术保障能力；举办首届新能源安全生产与应急技能竞赛及多项技术监督专业技能竞赛，以赛促学、以赛促练，在安全生产实践中推动安全文化落地生根。

Recognizing the importance of developing safety culture, SPIC formulates work safety training plans systematically for all employees in accordance with the principles of “compliance, classification, and grading”. Besides, we produce and release the *30 Construction Countermeasures* video, formulate and implement the *Resource Coordination Implementation Plan of Technical Supervision Management*, and organize 5 technical supervision training sessions, 19 online lectures at the online learning platform, and 9 online interpretation sessions of “Twenty-Five” countermeasures, to enhance the production technology guarantee abilities of grass-roots personnel. We host the First New Energy Work Safety and Emergency Skills Competition, and a number of technical supervision skills competitions to facilitate learning and practice. All these efforts are aimed to spread work safety culture in production practices.

## 责任在肩 助力能源安全 Ensuring Energy Security by Undertaking Due Responsibility

国家电投全力提升能源安全保障水平，以安全规范、能源科技、安全科技等助力能源安全与可持续发展，《电网运行准则》于2015年作为国家标准实施以来，有力地保障了电网安全稳定运行，维护了电网正常运行秩序，2023年，国家电投作为主要完成单位之一编制的GB/T 31464—2015《电网运行准则》荣获国家标准化领域最高奖项“中国标准创新贡献奖”一等奖；“能源安全科技创新”论坛暨能源安全科技创新成果发布会上，中国电力发布6项能源安全科技创新成果；喜获安全生产领域唯一的全国性安全科技奖项——中国安全生产协会安全科技进步一等奖4项，创国家电投历史最好成绩。

SPIC is committed to enhancing energy security guarantee competence. To this end, the Company leverages security standards, and science and technology in energy and security to contribute to energy security and sustainable development. Since the implementation of the *Grid Operation Code* as a national standard in 2015, it has effectively guaranteed the safe and stable operation of grids, and maintained the orderly operation of grids. In 2023, the *Grid Operation Code* (GB/T 31464-2015), for which SPIC was one of major drafters, won the first prize of the “China Standard Innovation Contribution Awards”, the highest award in the field of national standardization. At the Forum on Scientific and Technological Innovation of Energy Security and Release Conference of Scientific and Technological Innovation Achievements for Energy Security, SPIC China Power International Development released 6 scientific and technological innovation achievements for energy security, and SPIC was granted four first prizes of scientific and technological advancement in security by China Association of Work Safety, the only national safety science and technology award in work safety field, hitting a new record.



国家电投中国电力发布6项能源安全科技创新成果  
SPIC unveiled 6 scientific and technological innovation achievements for energy security

国家电投贵州普安电厂风光火储一体化示范项目是贵州省目前装机容量最大的一体化能源保供项目  
The demonstration project integrating wind power, PV power, thermal power, and energy storage for SPIC Pu'an Power Plant is the integrated energy supply project with the largest installed capacity in Guizhou Province

## 助力和谐社区

国家电投争做服务“国之大者”的表率，牢记企业社会责任，用实干精神践行人类命运共同体理念，扎实推动共同富裕，实实在在造福人民。

## Contribution to Community Harmony

SPIC bears in mind the country's most fundamental interests and its corporate social responsibility, plays its part in building a community with a shared future for mankind, and strives for common prosperity and people's wellbeing.

## 聚力乡村振兴

## Contributing to Rural Revitalization

2023 年，国家电投深入贯彻习近平总书记关于“三农”工作的重要论述和指示批示精神，坚决落实中央农村工作会议部署和中央一号文件全面推进乡村振兴重点工作的意见。严格落实“四个不摘”，积极推动农村能源转型变革，扎实推进“绿电+乡村振兴+生态”融合发展；以增加农民收入为责任使命，开展“雪炭 N 行动”；组织编制《关于能源革命推动我国农业农村现代化建设的建议实施方案》的国家方案；组织各单位共 68 个县申报农村能源革命试点县，助力定点帮扶县经济社会高质量发展，全年超额完成各项帮扶任务，让乡村更加繁荣。

In 2023, SPIC implemented President Xi Jinping's important remarks on work related to agriculture, rural areas and farmers, the work deployment stated at the central rural work conference, and the key tasks to comprehensively push forward rural vitalization outlined in the No. 1 Central Government Decree for 2023. We made sure that though poverty had been eliminated, all of the related responsibilities, policies, support, and oversight remained in place, facilitated rural energy transformation and reform, and made steady headway in the integrated development of "green power + rural revitalization + ecology". Taking increasing farmers' income as our mission, we carried out the "Snowy-day Charcoal Initiative N". Moreover, we prepared a national plan, the *Suggested Implementation Plan on Promoting the Modernization Drive of Agriculture and Rural Areas in China through Energy Revolution*. We helped 68 counties apply for rural energy revolution pilot projects to boost the high-quality economic and social development of our targeted counties, and overperform on fulfilling assistance tasks, making rural areas more prosperous.



国家电投修建四川省凉山州美姑县侯古莫镇卫生院，基本满足当地近 2 万名群众的就医需求

SPIC built the Hougumo Town Health Center in Meigu County, Liangshan Prefecture, Sichuan Province, basically meeting the medical needs of nearly 20,000 local residents



国家电投河南省信阳市商城县丝瓜络产业帮扶项目助力农民增收

SPIC loofah sponge project in Shangcheng County, Xinyang City, Henan Province, helps farmers increase their income

### 产业振兴

### Industrial revitalization

- 连续 3 年投入帮扶资金 1500 万元，全力打造商城县磨盘山村精品民宿文旅融合示范项目
- Invest RMB 15 million for three years in a row in building a demonstration project of boutique homestays for cultural tourism in Mopanshan Village, Shangcheng County
- 持续打造美姑县瓦候乡“瓦候蜂蜜”品牌，全乡养蜂年产值达 100 余万元，酿出“甜蜜致富路”
- Make sustained efforts to foster the "Wahou Honey" brand in Wahou Township, Meigu County, with annual honey output reaching over RMB 1 million in Wahou

### 人才振兴

### Talent revitalization

- 组织科研院所、专业机构专家对乡村基层干部、乡村振兴带头人和技术人员共 1386 人次开展种养殖技能、农产品电商发展案例分析、现代农业发展等培训
- Invite experts from scientific research institutes and professional institutions to provide 1,386 rural grassroots cadres, rural revitalization leaders and technical personnel with training sessions over planting and breeding skills, e-commerce case analysis of agricultural products, and modern agricultural development

### 文化振兴

### Cultural revitalization

- 通过“映山红”公益行动助力乡村教育提升、健康提升、文化打造
- 加强基层医疗服务保障
- 开展美丽乡村基础设施改造
- Boost educational, healthcare, and cultural development in rural areas through the "Yingshanhong" public welfare program
- Pool efforts to grassroots medical services
- Implement infrastructure renovation for beautiful rural areas



国家电投在陕西省延安市延川县贾家坪镇曲溪交村建设屋顶分布式光伏电站

SPIC constructed a rooftop distributed PV power station in Quxijiao Village, Jiapijaping Township, Yanchuan County, Yan'an City, Shaanxi Province

### 走进“减贫担当”——贵州威宁能源“农光互补”项目

Responsibility for poverty reduction - integrated development project of agriculture and PV power in Weining, Guizhou



贵州省毕节市威宁县，地处黔西北，光照资源丰富，是贵州省面积最大、海拔最高、人口最多的多民族区域大县，目前也是国家乡村振兴重点帮扶县。遵照威宁县“十四五”农业规划，贵州金元威宁能源公司致力于在威宁大力发展山地“农光互补”项目，近年来，以建设百万千瓦级新能源基地为契机，投入大量人力物力以“公司+合作社+农户”模式探究乡村振兴战略突破关键点，以“小规模村集体种养殖合作社+当地农民工”的合作思路开展农业种植，为当地百姓增收致富探索出一条新的路径。2023年，威宁能源公司农业种植工作再次全面铺开，在所属光伏场站排查适宜耕种的土地达33000余亩，已规模化集中开展各类粮化作物种植，万余亩荒山荒地焕发了生机。截至2023年8月，威宁能源公司在威宁区域建成“农光互补”电站共计27座，总计支付土地流转费用超5.6亿元，已基本完成全域粮化作物种植，提供约5万余人次务工机会，惠及农户约500户、带动增收约500万元，有效提高了荒山荒地或低产旱地的利用价值，成为助力农民稳定增收、地方与企业互惠共赢和扎实推进乡村振兴战略的重要助力。

Located in northwest Guizhou, Weining County, Bijie City, Guizhou Province, is endowed with rich sunlight resources. It is the largest, highest-altitude, and most populous county where multiple ethnic groups inhabit, and receives rural revitalization assistance from the country. Aligning with the “14<sup>th</sup> Five-Year Agricultural Plan” of Weining County, Guizhou Jinyuan Weining Energy Company is committed to advancing the integrated development project of agriculture and PV power in the mountainous area. Embracing the opportunity of constructing a GW-level new energy base in this region, the company has pooled manpower and material resources to explore the “company + collective + farmer” model for rural revitalization. To be specific, it cooperates with small-scale breeding cooperatives and local farmers in agricultural planting, pursuing a new pathway for income increase and local prosperity. In 2023, the company continued its agricultural planting. At its PV stations, it identified arable land of over 33,000 mu, and planted grain crops on a large scale there, revitalizing numerous barren mountains and wastelands. As of August 2023, the company has built 27 PV stations where planting of grain crops is available, and paid land transfer fees of RMB 560 million. The project has offered 50,000 jobs, benefited 500 farmers, and increased the farmers’ income by RMB 5 million. In addition, it has effectively improved the utilization value of barren hills, wastelands or low-yield dry lands, boosted the steady income increase of farmers, benefited both the enterprise and the local government, and solidly promoted rural revitalization.



国家电投贵州威宁么站农业光伏电站种植的万寿菊  
Marigolds Planted at SPIC's Mozhan PV Station in Weining, Guizhou

## 投身志愿公益 Engaging in Volunteer Service Activities

当平凡之力汇聚成炬，点亮的是整片天地，温暖的是每一个角落。国家电投积极围绕文化教育、民生保障、生态环保等公益领域开展公益善举。2023年，公益捐赠总额6291.57万元，员工志愿者活动参与人数24478人次，员工志愿者活动时长36112小时。

The ordinary efforts pooled will make a big difference. SPIC devotes itself to public welfare fields such as education, people's wellbeing, and ecological environment protection. In 2023, our donations valued RMB 62.92 million, and 24,478 employee volunteers participated in volunteer services for 36,112 hours in total.

### 国家电投公益品牌“映山红”

SPIC's "Yingshanhong" public welfare program



国家电投自2003年开展“映山红”志愿服务活动，在多年的探索中不断扩大覆盖面，发展形成17个子品牌，形成了一套行之有效的工作机制，成为央企中具有鲜明特色和影响力的志愿服务品牌。截至2023年底，已累计建立爱心助学工作站34个、服务点319个，建设“映山红”希望小学36所、爱心书屋46个，资助学子8782人。2023年，开展“映山红·听风沐光”公益活动，为6名重度听障儿童植入人工耳蜗。2023年11月10日，国家电投举办“映山红”志愿服务20周年纪念大会，同步启动专项医疗救助、能源科普、直播助农、爱心助学、社区助老助民等多方面联合公益行动。

Since 2003, SPIC has launched the “Yingshanhong” volunteer service program, and its 17 sub-programs that cover more fields with years of efforts. This program has worked with an effective operation mechanism, and been recognized as a featured and influential volunteer service program. As of the end of 2023, the program has set up 34 student aid workstations, 319 service points, 36 “Yingshanhong” Hope Primary Schools and 46 libraries. 8,782 students have been funded by the program. In 2023, the “Yingshanhong-Hearing Aid” public welfare activity helped 6 severely hearing-impaired children receive cochlear implants. On November 10, 2023, the SPIC held the 20<sup>th</sup> Anniversary Conference of the “Yingshanhong” Volunteer Service Program, and launched a series of public welfare activities including special medical assistance, energy science popularization, live streaming to sell agricultural products, student aid, and assistance to the elderly and those with difficulties in communities.



国家电投在孟加拉国帕亚拉开展“映山红·向日葵”爱心助学活动  
SPIC launched the “Yingshanhong Sunflower” student aid initiative in Payara, Bangladesh

## 驰援抢险救灾 Rushing to Rescue and Disaster Relief

面对灾情险情，国家电投第一时间捐款、捐赠救灾物资，组织救援力量驰援抢险救灾一线，全力守护人民群众生命财产安全和社会稳定。

In case of disasters, SPIC always donates money and disaster relief supplies timely, assigns rescue teams to disaster-hit areas to protect the safety of people's lives and property, and ensure social stability.

### 驰援积石山 6.2 级地震抗震救灾第一线

Disaster relief in the Jishishan 6.2-magnitude earthquake



12月18日23时59分，甘肃临夏积石山县发生6.2级地震，震源深度10公里，部分水、电、交通、通信等基础设施受损。地震发生后，国家电投立即组织部署抗震救灾和能源保供工作，成立地震灾害专项应对小组，实时跟踪指导甘肃、青海地区相关单位开展应急处置和余震防范工作，要求在确保人员及设备设施安全的前提下，全力保障抗震救灾电力供应。国家电投驻甘驻青单位党组织迅速响应，成立多支党员先锋队、突击队，党员干部冲锋在前，带领职工群众全面投入到抗震救灾抢险保供工作中。全国总工会授予黄河公司积石峡发电分公司“全国工人先锋号”荣誉称号。

At 23:59, December 18, a 6.2-magnitude earthquake hit Jishishan County, Linxia, Gansu Province, with a focal depth of 10 km. Consequently, some water, electricity, transportation, and communication facilities were damaged. After the earthquake, SPIC immediately deployed earthquake relief and energy supply tasks, and set up a response team to track and guide relevant entities in Gansu and Qinghai in real time to conduct emergency response and aftershock prevention. All efforts were made to ensure the power supply for earthquake relief while protecting the safety of personnel, equipment and facilities. The SPIC subsidiaries and affiliates in Gansu and Qinghai responded quickly. They establish multiple front-line groups to lead employees to engage in earthquake relief and rescue. Jishixia Power Generation Branch of SPIC Huanghe Hydropower Development was honored with the "National Worker Pioneer" by All-China Federation of Trade Unions.



国家电投黄河公司积石峡发电分公司抗震救灾党员突击队队员正在准备抢修物资

The members of front-line groups from Jishixia Power Generation Branch of SPIC Huanghe Hydropower Development are preparing materials for rush repairs

## 争做全球公民

## Growing into a Global Citizen

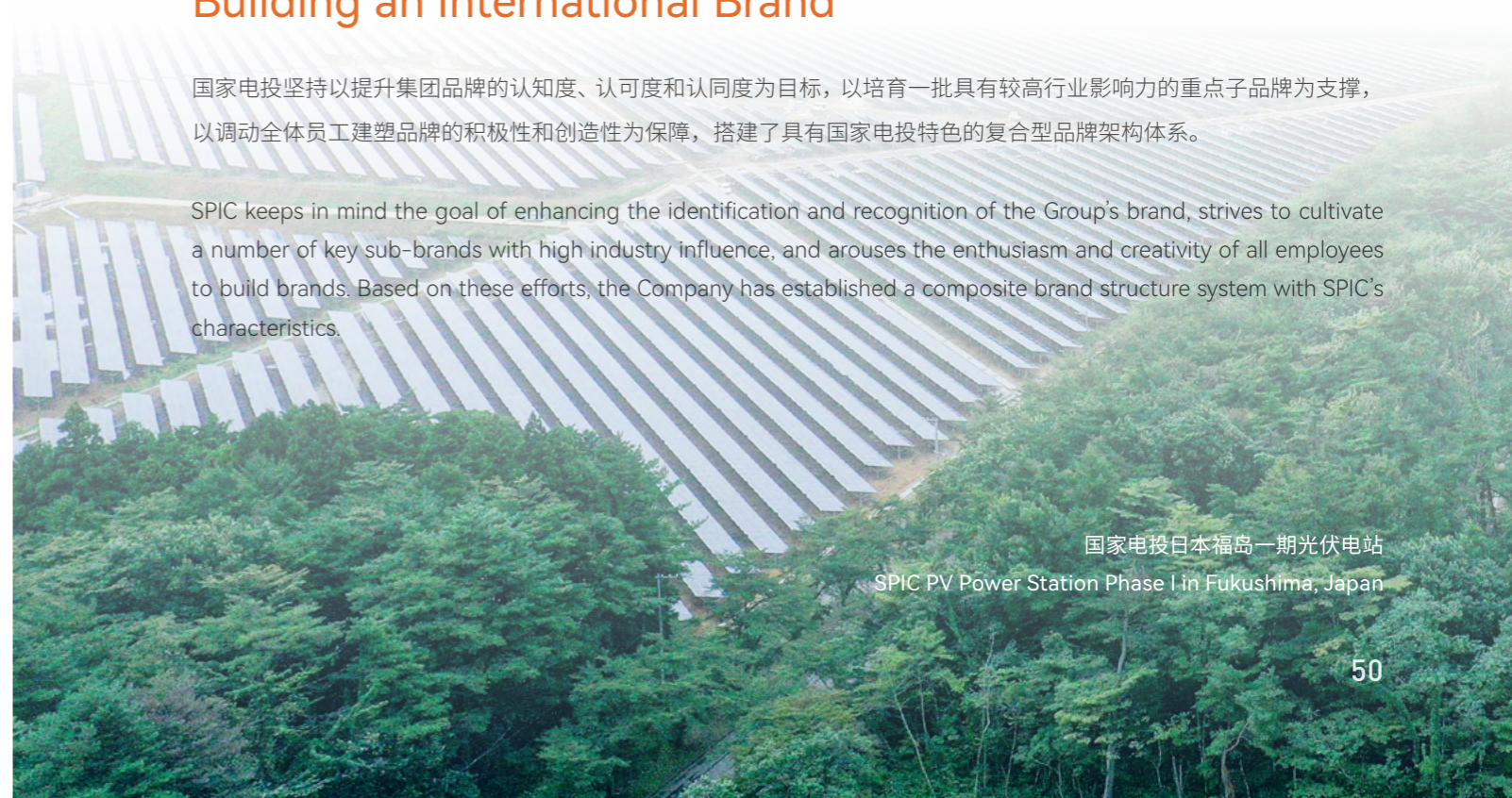
民心相通是打造全方位能源国际合作的强劲引擎，是共建“一带一路”的社会根基。国家电投坚持在海外发展中承担大国责任，尊重东道国法律法规，立足高质量发展打造精品项目、提供优质服务，用心用情打造民生项目、解决当地民生难题、带动当地就业等，积极推进文明互鉴，贯彻在哪里做工程建设就在哪里播种文明友好种子的原则，推动东道国可持续发展进程，拉紧通民心、达民意、惠民生的共同纽带。

People-to-people connectivity is a strong momentum for fostering all-round international energy cooperation and the social foundation for jointly building the "Belt and Road". SPIC is committed to assuming the responsibility as a central SOE of a major country in overseas development. The Company makes sustained efforts to respect the laws and regulations of the host country, provide excellent projects and services for high-quality development, engage in projects for public wellbeing to address the concerns of local people and offer job opportunities, promote mutual learning between civilizations and friendship development, and boost sustainable development course of the host country.

## 打造国际品牌 Building an International Brand

国家电投坚持以提升集团品牌的认知度、认可度和认同度为目标，以培育一批具有较高行业影响力的重点子品牌为支撑，以调动全体员工建塑品牌的积极性和创造性为保障，搭建了具有国家电投特色的复合型品牌架构体系。

SPIC keeps in mind the goal of enhancing the identification and recognition of the Group's brand, strives to cultivate a number of key sub-brands with high industry influence, and arouses the enthusiasm and creativity of all employees to build brands. Based on these efforts, the Company has established a composite brand structure system with SPIC's characteristics.



国家电投日本福岛一期光伏电站  
SPIC PV Power Station Phase I in Fukushima, Japan

位列“2023 世界品牌 500 强”榜单第 **241** 位 位列“2023 中国品牌 500 强”榜单第 **60** 位

Ranking the **241<sup>st</sup>** place among the “Top 500 World Brands in 2023” and the **60<sup>th</sup>** place among the “Top 500 Chinese Brands in 2023”

近年来，国家电投培育了“国和一号”等重大专项技术品牌、“综合智慧零碳电厂”等新赛道业务品牌、“国氢科技”等一批独角兽企业品牌，以及“映山红”社会公益品牌等，全体员工的品牌意识不断提升，建塑品牌的积极性、创造性不断加强。

In recent years, SPIC has cultivated multiple major technology brands such as “Guohe One”, business brands in the new field such as “SEP”, unicorn companies such as SPIC Hydrogen Energy, and public welfare programs such as “Yingshanhong”. All employees have increasing brand awareness, and more enthusiasm and creativity of building brands.

### 核心子品牌 Core sub-brands

国和一号、暖核一号、国冉一号、天枢云、天枢一号、天玑壹、御风、电能 e 购、SOMPAS、穹仪系统、电投壹、和睿系统、氢腾、容和一号、黄河水电多晶硅、氢涌、青鑫、秸能一号、新源智储、国核锆业、启源芯动力  
Guohe One, Warm-U-Clear No.1, Guoran One, Dubhe Cloud, Dubhe One, Phegda One, Aeolus, Mall.ESPIC.COM.CN, SOMPAS, Dome System, Dian Tou Yi, Herui System, Hydrogen Forerunner, IC-Star, Polycrystalline Silicon lab of Huanghe Hydropower Development, Hydrofore, Qing Xin, Jieneng One, XYZ Storage, State Nuclear Zirconium Industry, and Qiyuan Core Power



“码”上进入国家电投品牌商店  
Scan the QR code to visit the SPIC brand store

国家电投“国和一号”IP 形象  
SPIC “Guohe One” IP Image

## 聚焦海外发展 Highlighting Overseas Development

时间的刻度，标注历史坐标，昭示前进方向。2023 年是共建“一带一路”倡议提出十周年，多年来，公司积极贯彻落实习近平总书记“四个革命、一个合作”能源战略思想，推动共建“一带一路”走深走实，聚焦重点领域、重点地区、重点项目，持续推进民生工程、民心工程，无数员工接续奋斗，建设了一大批代表世界、代表时代高水平的重大标志性工程和“小而美”项目，稳步提高跨国经营发展能力、国际竞争能力和品牌影响力。

As time goes on, history demonstrates the correct direction of progress. 2023 witnessed the tenth anniversary of the proposal of the “Belt and Road” Initiative. Over the years, SPIC has actively practiced President Xi Jinping’s new energy security strategy of “Four Revolutions, and One Cooperation”, and played its part in advancing the “Belt and Road” Initiative by constructing major projects for people’s wellbeing and interests in key fields within key regions. With the constant efforts of our employees, we have built a large number of major landmark projects, and small-scale quality projects that are recognized as high-level projects globally in the current era, steadily stepping up cross-border business development capabilities, international competitiveness and brand influence.

截至 2023 年底，公司境外业务已遍及哈萨克斯坦、巴基斯坦、土耳其、巴西、缅甸、墨西哥等 47 个国家和地区，其中共建“一带一路”国家 38 个。境外装机容量 1034 万千瓦，其中清洁能源装机 720 万千瓦，清洁能源占比 69.7%。境外资产总额 1314 亿元，同比增长 5.86%；境外全年营收 221 亿元，同比增长 4.14%；实现境外利润总额 45.86 亿元，同比增长 9.19%。

As of the end of 2023, our overseas business has been expanded in 47 countries and regions such as Kazakhstan, Pakistan, Türkiye, Brazil, Myanmar, and Mexico, including 38 countries along the “Belt and Road”. SPIC has posted the overseas installed capacity up to 10.34 GW, with that of clean energy reaching 7.2 GW, a share of 69.7%. The overseas assets have amounted to RMB 131.4 billion, up 5.86% on year-on-year basis. The annual revenue has totaled RMB 22.1 billion, up 4.14% on a year-on-year basis. The overseas profits have registered RMB 4.59 billion, up 9.19% on a year-on-year basis.



国家电投土耳其胡努特鲁电厂一期光伏发电项目  
SPIC Phase I PV Power Project of Hunutlu Thermal Power Plant in Türkiye

### 孟加拉国·五凌电力科巴风电场

2023年10月12日，五凌电力科巴风电项目投产，该项目是中孟两国在“一带一路”倡议下建设的孟加拉国首个集中式风电项目，对提高孟加拉国可再生能源比重、促进新能源消费和节能减排发挥重要作用，被当地主流媒体誉为“中孟能源合作的典范”。项目建设过程中，为当地提供超过1500个工作岗位，投产后的运营也将以本地员工为主。项目每年可为当地提供超过1.45亿千瓦时绿色电力，满足10万户家庭用电需求。

### Wind Farm of SPIC Wuling Power in Cox's Bazar, Bangladesh

On October 12, 2023, the Wind Farm of SPIC Wuling Power in Cox's Bazar, Bangladesh was put into operation. It is the first centralized wind power project in Bangladesh invested by China under the framework of the "Belt and Road" Initiative. This project plays an important role in increasing the proportion of renewable energy in Bangladesh, promoting new energy consumption, and boosting energy conservation and emission reduction. It is praised by local mainstream media as a "China-Bangladesh energy cooperation model". During construction, the project offered more than 1,500 jobs in the local. And after its operation, local workers still account for a big share. The project supplies more than 145 GWh of green power to the local each year, meeting the power needs of 100,000 households.



### 巴基斯坦·中电胡布 2×660兆瓦燃煤发电项目

中电胡布2×660兆瓦燃煤发电项目位于巴基斯坦俾路支省胡布镇，是中巴经济走廊最大的燃煤发电项目之一，也是国家电投首个海外绿地项目，于2019年8月17日投入商运，每年可为巴基斯坦提供90亿千瓦时安全、稳定的电能，满足400万户巴基斯坦家庭的用电需求，截至2023年底，已累计发电超过235.7亿千瓦时，极大缓解了巴能源短缺现状，对于持续促进巴基斯坦当地经济社会发展具有重要意义。2023年，获“中巴经济走廊”杰出贡献奖。

### CPIH 2x660MW Coal-fired Power Generation Project in Hub, Pakistan

Located in Hub Township, Balochistan, Pakistan, CPIH 2x660 MW Coal-fired Power Generation Project is one of the largest coal-fired power generation projects in the China-Pakistan Economic Corridor, and the first overseas greenfield project of SPIC. This project was put into commercial operation on August 17, 2019. It can supply 9 TWh of safe and stable electricity every year, meeting the power demand of 4 million local households. As of the end of 2023, the project has generated over 23.57 TWh of electricity, alleviating the current energy shortage in Pakistan significantly and thus contributing to the local economic and social development in Pakistan constantly. In 2023, the project was honored with the Outstanding Contribution Award for the "China-Pakistan Economic Corridor".



### 哈萨克斯坦·阿克莫拉州风电场

2023年9月17日，中国电力哈萨克斯坦能投阿克莫拉州二期56兆瓦风电项目全容量并网，保持中亚最大纪录。每年为当地提供约2.15亿千瓦时的清洁电能，为哈萨克斯坦能源结构“去碳化”，早日实现“双碳”目标贡献力量。

### Akmola Wind Farm in Kazakhstan

On September 17, 2023, the second phase of the 56 MW Wind Farm Project of SPIC in Akmola, Kazakhstan was fully connected to the grid, making the Akmola wind power cluster remain the largest in Central Asia. This project can supply 215 GWh of clean energy to the locals every year, contributing to the "decarbonization" of Kazakhstan's energy structure and the early realization of the "dual carbon" goals.



### Kinich In-service PV Project in Mexico

SPIC has an in-service installed capacity of 1.33 GW in Mexico, making it the second-largest independent renewable energy power generation company in Mexico. On December 8, 2023 (local time), China Power International Holding Limited (CPIH) completed the delivery of the Kinich 216 MW in-service PV project in Mexico. Located in Chihuahua State in northern Mexico, this project consists of two 36 MW power stations and one 144 MW power station. The annual power generation of the project can meet the power demand of 100,000 households in Mexico, and reduce carbon dioxide emissions by over 320,000 tons, contributing to Mexico's green energy transition.

### 墨西哥·Kinich 在运光伏项目

国家电投在墨西哥拥有在运控股装机容量达133万千瓦，是墨西哥第二大可再生能源独立发电公司。当地时间2023年12月8日，中电国际完成墨西哥Kinich 216兆瓦在运光伏项目交割，Kinich项目位于墨西哥北部奇瓦瓦州，包括两座36兆瓦电站及一座144兆瓦电站。项目年发电量相当于墨西哥10万个家庭总用电量，等效减排二氧化碳超过32万吨，为墨西哥绿色能源转型持续作出贡献。



### Red Sea Integrated Smart Energy Project in Saudi Arabia

The Red Sea Integrated Smart Energy Project in Saudi Arabia, of which SPIC Huanghe Hydropower Development is a shareholder, is the world's largest off-grid SEP project under construction, and the world's largest chemical energy storage project in progress. The project is expected to be put into commercial operation in 2024. Adopting 100% renewable energy, it will reduce carbon dioxide emissions by about 567,000 tons annually. Its solid waste treatment station can dispose of 11,175 tons of solid waste annually, and its sewage treatment station can treat 18,515 cubic meters of sewage daily.

### 沙特·红海综合智慧能源项目

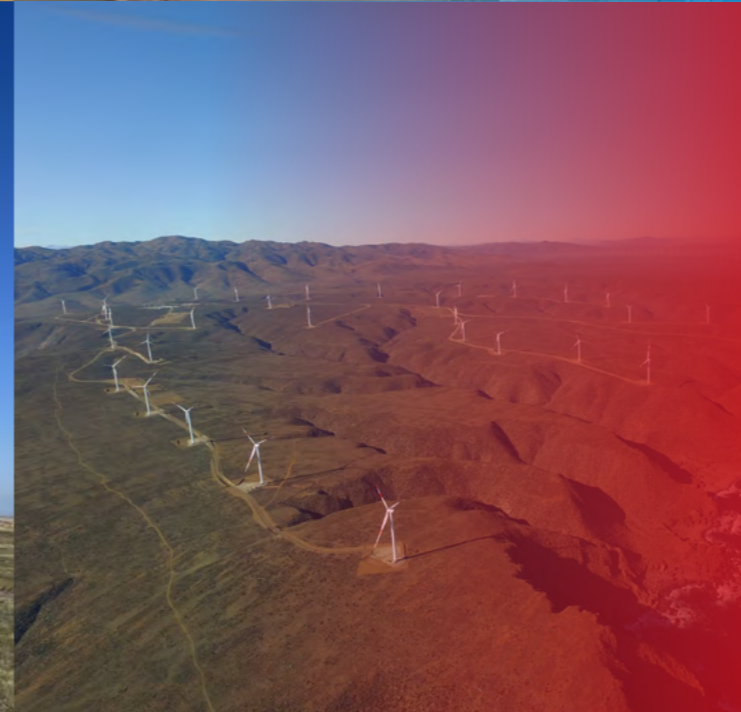
由国家电投黄河公司参股的沙特红海综合智慧能源项目，是全球在建规模最大的离网型零碳综合智慧能源项目、全球在建最大化学储能项目。该项目预计2024年投入商运，可100%用上可再生能源，每年可减排二氧化碳约56.7万吨，固废处理站每年可处理固废垃圾11175吨，污水处理站每天可处理污水18515立方米。

### Punta Sierra Wind Farm in Chile

The Punta Sierra Wind Farm in Chile, invested and developed by SPIC, is located in the coastal area of Coquimbo Region (Region IV) in central Chile. It is the largest clean energy project directly invested by a Chinese company in Chile. The annual power generation of the project can meet the power demand of 130,000 local households, and reduce carbon dioxide emissions by 165,000 tons. After operation, the project will directly offer 420 jobs, and boost the social and economic development of Chile.

### 智利·蓬塔风电场

国家电投投资开发的智利蓬塔风电场位于智利中部的科金博大区（第IV大区）的沿海地区，是我国在智利直接投资的最大的清洁能源项目。该项目年均发电量可满足13万户当地家庭的用电需求，相当于减排二氧化碳16.5万吨。项目投产后直接创造420个就业岗位，有力支持智利社会经济发展。



## 服务当地民生 Contributing to Local People's Wellbeing

国家电投以海外项目建设为平台，浇筑海外履责的坚实基座。主动投身到项目所在地的经济、社会、民生建设，积极响应“一带一路”倡议，落实员工属地化，并为海外项目当地提供物资捐赠、公共设施建设和、社会技能培训等帮扶善举，以实际行动造福当地社区民众。

While constructing overseas projects, SPIC is committed to undertaking its social responsibility by contributing to the economic, social and wellbeing development of the locals. Embracing the “Belt and Road” Initiative, we employ more local employees, donate supplies, engage in the construction of public utilities, and organize skill training to benefit the public in local.

### 造福当地民生，构建友谊桥梁

Benefiting local people's wellbeing, and building friendship



基里巴斯共和国由 33 个岛屿组成，由于环礁岛屿的多孔特点，海水盐析现象严重影响了地下水的水质，导致当地淡水资源较为稀缺，如何获取干净的饮用水是当地民众需要每日面对的难题。国家电投深度挖掘当地民生需求，以“新能源+”为抓手，创新性开发“光伏发电+空气集水”的工作模式，利用当地丰富的光照资源，在基里巴斯首都塔拉瓦 Tungaru 中心医院架设屋顶光伏，同时以电带水，以集装箱取水房的方式提供直饮水，供院内医护人员及病患饮用。该项目获得基里巴斯各部委、我国驻基里巴斯大使馆、医院及附近社区等的高度认可。2023 年 12 月 29 日，中电国际基里巴斯“光伏+直饮水”综合智慧能源项目移交仪式举行，基里巴斯健康与医疗服务部助理秘书长 Tiina Raj 及中心医院重大项目主管等基方人员，中方投资与施工团队人员共同出席仪式。

The Republic of Kiribati consists of 33 islands. Due to the porous characteristics of atoll islands, the salt precipitation of seawater has seriously impaired groundwater quality, resulting in a freshwater shortage. A top concern of the public lies in the access to clean drinking water. Learning about the drinking water demand, SPIC has introduced a new model of “PV power generation + water collection from air”. To be specific, leveraging abundant light resources, SPIC has paved PV panels on the roofs of the Central Hospital in Tungaru, capital of Kiribati to generate green power while collecting water. Then direct drinking water is supplied to medical staff and patients at container-type water supply sites. The project has been highly recognized by the ministries and commissions of Kiribati, the Chinese Embassy in Kiribati, hospitals and nearby communities. On December 29, 2023, the delivery ceremony of the CPIH “PV Power + Direct Drinking Water” Integrated Smart Energy Project was held. Tiina Raj, Assistant Secretary-General of the Ministry of Health and Medical Services of Kiribati, the head of major projects of the Central Hospital, as well as the members of Chinese investment and construction teams attended the ceremony.



仪式上，Tiina Raj 与中电国际和山东院代表一道共同饮用第一批“零碳”直饮水

At the ceremony, Tiina Raj drank the first batch of “zero-carbon” direct drinking water together with the representatives of CPIH and Shandong Electric Power Engineering Consulting Institute

非常欣喜可以亲自见证“光伏+直饮水”项目模式成功在基里巴斯落地，对国家电投表示由衷的感谢。对于基里巴斯来说，这是一种令人激动的解决方案。本项目将有效解决 Tungaru 中心医院内干净饮用水问题，减少因饮用地下水导致的并发症，极大程度改善医院内病患尤其是母婴患者的医疗环境。除了提供急需的饮用水外，项目配套的光储系统也会为医院内的供电保障提供帮助，维持医院的正常运行。

——基里巴斯健康与医疗服务部助理秘书长 Tiina Raj

I am very pleased to personally witness the successful implementation of the “PV Power + Direct Drinking Water” project model in Kiribati, and I would like to express my sincere gratitude to SPIC. For Kiribati, this is an exciting solution. This project will effectively address the clean drinking water shortage in Tungaru Central Hospital, reduce complications caused by drinking groundwater, and greatly improve the medical environment of patients, especially maternal and infant patients. In addition to supplying drinking water in urgent need, the project provides a PV power and energy storage system. This system will ensure power supply and maintain the normal operation of the hospital.

—— Tiina Raj, Assistant Secretary-General of the Ministry of Health and Medical Services of Kiribati

## 共促文化交流 Enhancing Cultural Exchange

“在各国前途命运紧密相连的今天，不同文明包容共存、交流互鉴，在推动人类社会现代化进程、繁荣世界文明百花园中具有不可替代的作用。”国家电投在国际化发展中积极推动文化交流、促进文明互鉴，2023年，国家电投一如既往地向世界讲好中国企业和各国人民为共建“一带一路”发展绿色能源的动人故事，展示负责任形象，参加2023“一带一路”媒体合作论坛，国家电投哈萨克斯坦札纳塔斯风电项目入选人民日报社2023“一带一路”建设案例。

“As the future of all countries is closely connected, tolerance, coexistence, exchanges and mutual learning among different civilizations play an irreplaceable role in advancing humanity’s modernization process and making the garden of world civilizations flourish”, as remarked by President Xi Jinping. SPIC actively boosts cultural exchange and mutual learning between civilizations in its international development. As a responsible enterprise, SPIC continued to play its part in developing green energy, and pushing forward the “Belt and Road” Initiative together with people throughout the world in 2023. The Company attended the 2023 Media Cooperation Forum on Belt and Road. And its Zhanatas Wind Power Project in Kazakhstan was selected as a 2023 “Belt and Road” construction case by People’s Daily



在“来吧！‘碳’想家”中土青年对话环节，来自清华大学、北京外国语大学、伊兹密尔巴克尔恰伊大学等高校学生及上海电力土耳其EMBA公司、上海能科土耳其分公司等青年代表，围绕“清洁能源的创新与更加绿色的未来”“打开环保青年低碳生活的想象力”进行交流，一致倡议要凝聚绿色发展共识，共担绿色发展责任，切实落实绿色发展行动

At the “Low-carbon Development” China-Türkiye Youth Dialogue, students from Tsinghua University, Beijing Foreign Studies University, Izmir Bakırçay University and other universities, as well as youth representatives from Türkiye EMBA Company of Shanghai Electric Power, and Türkiye Branch of SPIC Shanghai Energy Technology Development, exchanged insights on “innovation of clean energy and a greener future” and “unleashing the imagination of environmentally-friendly youth for low-carbon life”. They unanimously advocated the initiatives to build consensus on green development, share green development responsibilities, and effectively implement green development actions

## 国家电投举办“电亮中土，‘碳’梦未来”中土能源对话论坛 SPIC held the China-Türkiye Energy Dialogue Forum themed “Go Green for Future”

2023年11月3日，由国家电投主办，上海核工院、上海电力承办，中国驻土耳其大使馆、土耳其驻中国大使馆、中土友好基金会支持，环球网提供媒体支持的“电亮中土，‘碳’梦未来”中土能源对话论坛在土耳其伊兹密尔成功举办。这是国家电投连续四年举办的中土跨文化系列活动。本次论坛分为主题展览、双报告成果发布、“中土能源合作与人文交流”分享、“来吧！‘碳’想家”中土青年对话等环节，旨在探讨可持续能源发展路径，助力中土在能源、文化、经贸等领域交流互通。

On November 3, 2023, the China-Türkiye Energy Dialogue Forum themed “Go Green for Future” was held successfully in Izmir, Türkiye. This event was hosted by SPIC, undertaken by Shanghai Nuclear Engineering Research and Design Institute, and Shanghai Electric Power Co., Ltd., supported by the Chinese Embassy in Türkiye, the Turkish Embassy in China, the Türkiye-China Friendship Foundation, and Global Network. This Forum is one of the China-Türkiye cross-cultural series events held by SPIC for four years in a row. The event consists of theme exhibitions, the release of findings of two reports, “China-Türkiye Energy Cooperation and Cultural Exchange”, and the “Low-carbon Development” China-Türkiye Youth Dialogue, with an aim to explore the pathways of sustainable energy development and facilitate communication and exchange in energy, culture, economy and trade between China and Türkiye.



国家电投中土能源对话论坛报告发布环节  
Release of Reports at the China-Türkiye Energy Dialogue Forum



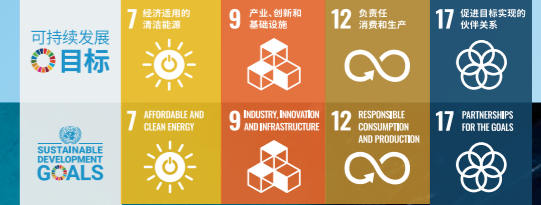
# 03

## 创新领先 以新质生产力 开拓能源革命

国家电投坚持创新驱动发展，着力推进能源领域重大科技攻关，持续加强绿色低碳技术创新，在核电重大专项、能源数字化、综合智慧能源、氢能与储能等核心技术领域取得了一系列创新成果，以科技创新持续增强产业发展核心竞争力和服务国家战略的核心功能。

### Leading Innovation New Quality Productive Forces for Energy Revolution

Highlighting innovation-driven development, SPIC has redoubled efforts to major scientific and technological breakthroughs in the energy field, and green and low-carbon technological innovation. As a result, the Company has proudly achieved a string of innovation fruits in core technology fields such as major nuclear power projects, energy digitalization, integrated smart energy, hydrogen energy, and energy storage. It will continuously build up the core competitiveness of industrial development and the core function of serving national strategies through scientific and technological innovation.



国家电投“国和一号”国产化设备安装  
SPIC “Guohe One” Domestic Equipment Installation

## 勇攀创新高地

国家电投持续强化科技创新主体作用，积极践行“提升核心竞争力和增强核心功能”使命担当，不断夯实创新基础、提升创新能力，以创新成果成效服务于行业发展和能源革命、培育发展新质生产力。

## Striving for New Innovation High

SPIC is dedicated to propelling scientific and technological innovation, and bearing the mission of “strengthening core competitiveness and core function” by consolidating the innovation foundation, and enhancing innovation capabilities. With innovation achievements, the Company spurs the industry development and energy revolution, and cultivates new quality productive forces.

发挥中央企业资源统筹作用，聚焦核能等领域，积极推动产学研深度融合和协同创新，建设“国和一号”产业链联盟等行业联盟和共性技术创新平台，强化产业链上下游组织和资源配置能力，推动取得系列标志性协同创新成果。

Give full play to resource coordination as a SOE, especially in the nuclear energy field, actively promote the deep integration and collaborative innovation of the industry, universities and research institutes, establish industry alliances, such as the “Guohe One” Industry Chain Alliance, and common technology innovation platforms, reinforce the organizational and resource allocation capabilities of the upstream and downstream in the industry chain, and facilitate the achievement of numerous landmark collaborative innovation results.

优化企业创新体系，打造创新链、产业链、资金链、人才链深度融合的创新体系，完善科技创新考核激励和成果转化机制，强化研发投入保障机制，为实现高水平创新提供坚实保障。

Optimize the innovation system that enables sufficient integration of innovation, industry, capital, and talent chains, refine the assessment, incentive and achievement transformation mechanisms of scientific and technological innovation, and strengthen the R&D investment guarantee mechanism to lay a solid foundation for high-performing innovation.

打造高水平创新平台，累计建成 40 余个国家和行业创新平台，建设的首个国家级光储实证实验平台取得系列成果，为行业技术进步和国家制定产业政策、技术标准提供支撑，建设的核能、氢能、储能等领域 6 个创新平台入选“十四五”首批国家能源创新平台。

Build high-level innovation platforms. Over 40 national and industry innovation platforms have been established. The first national-level PV power and energy storage demonstration experimental platform has made a series of achievements, providing support for industry technological progress and formulation of national industry policies and technical standards. The 6 innovation platforms in the fields of nuclear energy, hydrogen energy, and energy storage were included in the first batch of national energy innovation platforms in the “14<sup>th</sup> Five-Year Plan”.

创制高水平专利和引领性标准，截至 2023 年底，累计主持制订各类标准 1321 项，累计获得专利授权 13227 件，覆盖当前行业发展的重点领域。

Apply for top-tier patents and prepare leading standards. As of the end of 2023, 1,321 standards of various types have been drafted, and 13,227 patents have been authorized, covering key areas in current industry development.

研发投入 **157.28** 亿元

R&D investment:  
RMB **15.73** billion

荣获中国专利金奖 **1** 项

China Patent Gold Prize: **1**

2023 年 7 月 19 日，由中国重燃申报的“抗蠕变、长寿命镍基变形高温合金及其制备方法和应用”获得第二十四届中国专利金奖。

On July 19, 2023, the patent titled “Creep-resistant Long-service-life Nickel-based Wrought Superalloy as well as Preparation Method and Application thereof” of SPIC UGTC won the Gold Prize of the 24<sup>th</sup> China Patent Awards.



国家电投青海龙羊峡水电站  
SPIC Longyangxia Hydropower Station in Qinghai

## 牵头主导 2 项国际标准

## Lead the preparation of 2 international standards

5月，国际电工委员会（IEC）正式发布了由上海核工院主导制定的 IEC TR 63468《核设施—仪表、控制与电气系统—人工智能应用》；

In May, the International Electrotechnical Commission (IEC) officially unveiled the *Nuclear Facilities - Instrumentation and Control, and Electrical Power Systems - Artificial Intelligence Applications* (IEC TR 63468) the preparation of which was led by Shanghai Nuclear Engineering Research and Design Institute;

12月，国际标准委员会（ISO）批准发布上海成套院主导制定的 ISO 24173《微束分析 电子背散射衍射取向测量指南》。

In December, the International Organization for Standardization (ISO) approved the release of the *Microbeam Analysis - Guidelines for Orientation Measurement Using Electron Backscatter Diffraction* (ISO 24173) the preparation of which was led by Shanghai Power Equipment Research Institute.



国家电投上海核工院牵头的国家能源非能动核能共性技术研发中心揭牌仪式

Opening Ceremony of the National Energy Research and Development Center for Common Technologies of Passive Nuclear Energy led by SPIC Shanghai Nuclear Engineering Research and Design Institute

## 国家电投主编的《分布式供能工程标识系统编码规范》发布实施，是首个在综合智慧能源领域的基础性国家标准

Release of the *Specification for Coding of Identification System for Distributed Energy Supply Engineering* drafted by SPIC, the first national basic standard in the field of integrated smart energy



由国家电投广东公司珠海横琴能源发展有限公司牵头主编的《分布式供能工程标识系统编码规范》（GB/T 43033-2023），制定了冷、热、电多联供能源系统和相关附属设施的标识系统编码体系，实现了综合智慧能源行业的编码统一、全产业链全生命周期的闭环管理，为行业同类型能源站的设计、建设和管理水平的规范和提升提供重要的支撑，填补了该项领域技术空白。

The *Specification for Coding of Identification System for Distributed Energy Supply Engineering* (GB/T 43033-2023) drafted by Hengqin Energy under SPIC Guangdong Electric Power specifies the coding of identification systems for combined cooling, heating, and power (CCHP) systems and related ancillary facilities, which allows the unified coding of the integrated smart energy industry and the closed-loop management of the entire industry chain and the full life cycle. This standard provides important support for the standardization and improvement of the design, construction and management of energy stations in the same type, and fills the technical gap in this field.

## 深耕新兴产业

围绕服务于国家战略和行业发展，高质量推进国家重大科技任务攻坚，着力推动一流产业建设、传统产业转型升级、新兴产业培育和能源数智化发展，助推新时代能源高质量创新发展。

## Engagement in Emerging Industries

Aligning with the national strategy and industry development, SPIC strives for breakthroughs of major national scientific and technological tasks, and intensifies efforts to the development of first-class industries, the transformation and upgrading of traditional industries, the cultivation of emerging industries, the advancement of energy digitalization, and drive the high-quality and innovative development of the energy industry in the new era.

## 匠心锻造国之重器

## Advanced Equipment by Craftsmanship for the Country

汇聚合力，共筑重器。国家电投以国家科技重大专项为牵引，高端能源装备领域的创新高地正在加速形成，核心竞争力、核心功能持续提升增强。

SPIC pools efforts to develop advanced equipment. Focusing on major national science and technology projects, we accelerate the formation of an innovation highland in the field of high-end energy equipment, and build up our core competitiveness and core function.

◎ 打造全球最大非能动压水堆 “国和一号”  
◎ Build the world's largest passive Pressurized Water Reactor (PWR) “Guohe One”

“国和一号”是我国十六个重大科技专项之一，是国家电投落实我国三代核电自主化发展战略，依托工程项目平台实践和国家大型先进压水堆核电站重大专项开发的、具有完全自主知识产权的大型先进非能动压水堆核电型号，是自主设计

的中国核电技术品牌，其代表着当今世界三代核电技术的先进水平，是我国核电技术研发和产业创新的最新成果。国家电投构建了以企业牵头，国内高校院所、制造企业等深度参与的“国和一号”协同创新体系，攻克系列关键技术和整机设备，基本具备整机 100% 国产化能力。

“Guohe One” is one of China's 16 major scientific and technological projects. It is a large-scale advanced passive PWR nuclear power model with completely independent intellectual property right developed by SPIC to implement the national independent development strategy of third-generation nuclear power, relying on the practice of engineering project platforms and the major national initiative of large-scale advanced PWR nuclear power plants. It is an independently-designed nuclear power technology brand of China, representing the advanced level of the world's third-generation nuclear power technology today, and is the latest achievement of nuclear power technology research and development and industry innovation in China.

SPIC has built the “Guohe One” collaborative innovation system that is led by the Company, and domestic universities, research institutes, manufacturing enterprises deeply engage in. With this system, we have navigated a number of key technology and equipment, allowing the near-100% application of domestic equipment.

基本具备整机  
**100** %  
国产化能力  
SPIC basically  
has the ability of  
**100** %  
domestic finished  
equipment



◎ 突破重型燃气轮机关键技术  
◎ Make breakthrough in key technology of heavy-duty gas turbines

重型燃气轮机是实现化石能源清洁、高效利用的重大核心动力装备，被誉为装备制造业“皇冠上的明珠”，具备极高的战略地位和巨大的市场前景。

2023 年，重型燃气轮机研制取得系列突破，完成重点型号重型燃气轮机设计，突破百余项关键技术，实现关键零部件国产化并交付总装。

Heavy-duty gas turbines are core power equipment for clean and efficient use of fossil energy. They are known as the “crown jewel” in the equipment manufacturing industry, and boast a quite important strategic position and huge market prospect.

In 2023, SPIC made a series of breakthroughs in the development of heavy-duty gas turbines. Specifically, we designed the key models of heavy-duty gas turbines, addressed over 100 key technology issues, manufactured key components domestically, and delivered them for final assembly.



由国家电投研制的 300 兆瓦级 F 级重型燃气轮机首台样机总装下线

The first prototype of the 300 MW F-class heavy-duty gas turbine developed by SPIC rolled off the assembly line

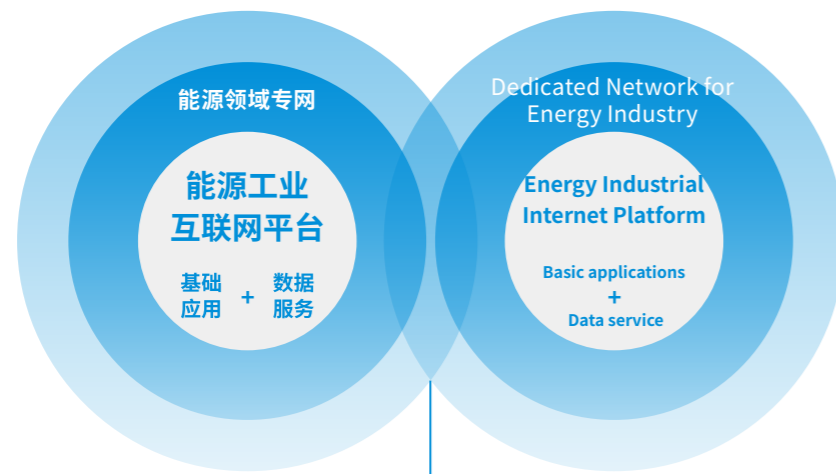
◎ 建设“能源大脑”能源工业互联网平台  
◎ Establish the energy industrial internet platform

为落实“四个革命、一个合作”能源安全新战略，加快构建清洁低碳、安全高效的能源体系，推动建设能源工业互联网平台。平台整合电力、煤炭等能源领域数据，重点开展能源工控安全态势感知、能源大数据应用、智慧能源项目开发等业务，为能源行业管理和决策提供有力支撑，为能源行业绿色安全智慧转型发展赋能。

2023 年，已建成覆盖电力、煤炭、石油等领域的能源工控安全态势感知和大数据平台，实现主力发电品种全覆盖，为国家能源系统安全、监管和决策提供支撑。

In order to implement the new energy security strategy of “Four Revolutions, and One Cooperation”, efforts are accelerated to develop a clean, low-carbon, safe and efficient energy system, and the energy industrial Internet platform. Integrating data from energy fields such as electricity and coal, the platform focuses on situational awareness of energy ICS security, energy big data application, and smart energy project development. This will provide strong support for energy industry management and decision-making, and empower the green, safe and smart transformation and development of the energy industry.

In 2023, the situational awareness of energy ICS security and big data platform was established. The platform involves electricity, coal, oil, etc., and covers all main types of power generation, ensuring the safety, supervision and decision-making of the national energy system.



解决方案提供商  
Solution provider

提供能源场站智慧化改造综合解决方案，成为解决方案提供商。

Provide comprehensive solutions to smart transformation of energy stations.

智慧能源 APP 服务社区  
Smart energy APP service community

推动产业链企业在平台开发和推广智慧应用 APP，降低碳排放，助力提质增效，建设智慧能源 APP 服务社区。

Foster a smart energy APP service community which facilitates enterprises in the industry chain to develop and promote smart APPs at the platform to reduce carbon emissions, and improve quality and efficiency.

## 着力推动产业创新 Boosting Industry Innovation

围绕能源高质量发展，大力推进一流产业建设、传统产业转型升级和新兴产业培育，打造产业创新高地，服务能源战略和行业发展。

Vigorous efforts are made to the development of first-class industries, transformation and upgrading of traditional industries, and cultivation of emerging industries in pursuit of implementing the energy strategy and advancing high-quality industry development.

◎ 光伏 PV power



建成从多晶硅生产、先进高效光伏电池研发、制造到组件回收的绿色全产业链，瞄准一流目标和提升产业核心创新能力，构筑技术、产品、平台等产业链关键环节核心竞争力。

We have established a full green industry chain covering polycrystalline silicon production, advanced and efficient PV cell R&D and manufacturing, and component recycling. We strive to strengthen the core innovation capabilities of the industry, and foster the core competitiveness of key links in the industry chain such as technology, products, and platforms.

布局攻关光伏发电关键技术

Tackling key technologies for PV power generation

攻克高效电池组件等多项自主化关键技术，晶体硅电池转换效率达 25.62%，钙钛矿 / 晶硅叠层电池效率达 30.4%，光伏组件产品连续两年荣登 PVEL “最佳表现” 榜，建成国内首条光伏组件回收中试线，综合回收效率达到 92%，光伏生态环境效应研究成果达到国际领先水平。

We overcame multiple independent key technologies such as efficient solar cells, with the conversion efficiency of crystalline silicon cells reaching 25.62%, and the efficiency of perovskite/crystalline silicon tandem cells being 30.4%. PV module products have been recognized for their best performance by PVEL for two consecutive years. The first domestic pilot line for PV module recycling has been built, with a comprehensive recycling efficiency of 92%. The research findings of PV's impact on the ecological environment have attained international excellence.

建设高水平国家级光伏创新平台

Building the high-level national PV innovation platform

建成投产首个国家级光伏、储能实证实验平台（大庆基地），连续两年面向行业发布《国家电投光伏、储能实证蓝皮书》及实证数据，规划开展约 640 种实证实验方案，形成的权威数据为国家制定产业政策和行业标准、行业技术升级迭代等提供科学依据和坚实支撑。

The first national PV power and energy storage demonstration experimental platform (Daqing Base) was completed and put into operation. The SPIC Blue Book of PV and Energy Storage Empirical Research, and empirical data have been released to the industry for two consecutive years. It has been planned to implement 640 empirical experimental schemes. The authoritative data generated provides a scientific basis and solid support for China to formulate industry policies and technical standards, and upgrade industry technology.

打造光伏电站效能标杆

Fostering the performance benchmark for PV power stations

年度组织完成重点场站现场提质增效技术落地实施，电站平均发电能力提升 6.93%，总发电量提升 1907.65 万千瓦时，完成一批光伏电站远程诊断与提质增效支持服务，取得良好综合效益。光伏电站系统效率提升 85.4%，保持行业领先水平。

Major stations implemented the measures of quality and performance improvement. These measures enabled the average power generation capacity to rise by 6.93%, and the total power generation to rise by 19,076.5 GWh. A number of remote diagnosis and quality and efficiency improvement support services for photovoltaic stations were completed, delivering real comprehensive benefits. The system efficiency of PV power stations has increased to 85.4%, maintaining the industry's leading level.

## ◎ 风电 Wind power



自主研发“御风”系统，将新能源技术和电力气象技术有效结合，为北京冬奥会、冬残奥会提供高质量气象保障服务；自主研发国内首台深远海漂浮式连续波激光测风雷达，在测量精度、分辨率、范围及数据利用率等方面实现诸多创新突破。联合中车集团研制国内首款海上定制化大风机“国车一号”，在央企创新合作及风机从标准化转向定制化等方面具有行业示范意义。

The independently-developed “Aeolus” system effectively combines new energy, electricity and meteorological technologies. It has provided high-quality meteorological support services for the Beijing Winter Olympics and Winter Paralympics. The first independently-developed deep-sea floating continuous wave laser wind radar in China has seen multiple innovation breakthroughs in measurement accuracy, resolution, range and data utilization rate. Cooperating with CRRC Corporation, the Company developed “Guoche One”, the first customized large offshore wind turbine in China. It has industry demonstration significance in terms of innovation cooperation among SOEs, and upgrade from standard wind turbines to custom ones.

## ◎ 水电 Hydropower



推动水电智能化发展，自主研发水电智能远程运维系统、动水清污、油光谱在线监测等先进技术成果并推广运用，水电智能远程运维系统达到行业领先水平，并持续迭代优化。推进融合水、机、电多元数据能效评价与提升技术研究，初步建成“数字孪生水系统”，为流域防洪减灾提供决策技术支撑。

SPIC promotes the intelligent development of hydropower. We have independently developed advanced technologies such as intelligent remote operation and maintenance systems, cleaning with flowing water, and oil spectrum online monitoring, and facilitated their application. Among them, the intelligent remote operation and maintenance system has reached the industry's leading level and witnessed continuous optimization. In addition, we have advanced the research on energy efficiency evaluation and improvement technology integrating water, machinery and electricity data, and initially built the “Digital Twin Yuanshui System” to technically help decision-making for flood control and disaster reduction in the basin.

## ◎ 火电 Thermal power



积极推进火电集约化管理，践行火电节能减排和转型升级政策要求，着力探索清洁火电发展路径，自主研发具备国内多种 DCS 控制平台应用能力的三冗错控制系统，攻克大比例掺烧准东煤、“储能调频+黑启动”、空冷式高参数汽轮机设计、减振阻尼叶片设计、“火电+储能”等关键技术。

We carry forward the intensive management of thermal power projects, implement the policies of energy conservation and emission reduction, and transformation and upgrading of thermal power stations, and explore the development path of clean thermal power. We independently developed the triplex redundancy control system applicable to various domestic DCS control platforms, and tackled key technologies such as large-proportion blending of Zhundong coal (causing more dust and slug in the boiler), “energy storage frequency modulation + black start”, air-cooled high-parameter steam turbine design, damping blade design, and “thermal power + energy storage”.

## 国家电投自主可控 DCS 研发与应用

Development and application of independent and controllable DCS by SPIC



2023年9月28日，国核自仪研制的火电机组自主可控DCS全范围设备获得国家工业和信息化部100%一类国产化认证。该设备首次采用全以太网架构，实现了超高精度对时、控制器冗余、高精度温度采集、全范围系统自检诊断等一系列技术突破，将人因工程设计理念及高可靠性、维修性、保障性、可测试性、安全性、环境适应性产品设计特征导入火电自主可控DCS产品中，实现关键核心零部件和整机自主可控的一个又一个创新突破。自主可控DCS的部署应用可显著降低进口备品备件费用，节约高昂的设备维修费，有效提升系统的本质安全性。12月2日，内蒙古公司霍林河坑口发电公司1号600兆瓦机组完成“DCS+DEH”100%国产一体化改造，成功并网。这是继9月29日完成贵州金元纳雍电厂300兆瓦机组首次应用、11月19日完成江西公司景德镇电厂660兆瓦机组首次成功应用后，国家电投自主可控DCS迎来的又一里程碑节点。至此，自主可控DCS已基本具备覆盖国家电投全部类型火电燃煤机组的能力，为我国发电领域工业控制系统完全实现自主可控提供了重要选项。

On September 28, 2023, the independent and controllable DCS full-range equipment for thermal power units developed by State Nuclear Power Automation System Engineering was granted the 100% Class I domestic equipment certificate by the Ministry of Industry and Information Technology. The equipment is provided with the full Ethernet architecture for the first time, and achieves a series of technological breakthroughs such as ultra-high precision time synchronization, controller redundancy, high-precision temperature data acquisition, and full-range system self-diagnosis. The human factor engineering design concept and product design features, such as high reliability, maintainability, supportability, testability, safety, and environmental adaptability, have been incorporated into the independently-controllable DCS product of thermal power, bringing numerous innovation breakthroughs in independently-controllable core components and finished machines. The deployment and application of the independently-controllable DCS product can slash the costs of imported spare parts, cut high expenses of equipment maintenance, and effectively improve the inherent safety of the system. On December 2, the No. 1 600 MW unit of the Huolinhe Pit-mouth Power Generation Company of SPIC Inner Mongolia Electric Power completed the 100% domestic “DCS + DEH” integrated transformation, and was successfully connected to the grid. This is another milestone for our independently-controllable DCS equipment, following the first application in the 300 MW unit of Guizhou Jinyuan Nayong Power Plant on September 29, and the first successful application in the 660 MW unit of Jingdezhen Power Plant of SPIC Jiangxi Electric Power on November 19. So far, the independently-controllable DCS equipment has been eligible to be used in all types of our coal-fired power units. This is an important option for the independently-controllable function of industrial control systems in China's power generation field.



国家电投内蒙古霍林河坑口发电公司  
SPIC Huolinhe Pit-mouth Power Plant in Inner Mongolia

## 焕新启航绿色能源 Refining Green Energy Mix

聚焦清洁能源规模化高质量发展，积极布局培育综合智慧能源、氢能、储能、生物质能等新赛道，因地制宜发展新质生产力。

SPIC is committed to the large-scale and high-quality development of clean energy. The Company actively sets foot in and promotes integrated smart energy, hydrogen energy, energy storage, and biomass energy, and enhances new quality productive forces according to local conditions.

### 综合智慧零碳电厂

SEP

全面推进能源革命，已不再是简单地增加供给、提高效率，而是需要对能源生产和消费方式进行重构。国家电投创新能源保供解决方案，发布“综合智慧零碳电厂开发技术手册（2.0）版”，通过聚合新能源、储能、生物质、可调负荷等资源，将各技术条线资源以属地化的形式构筑为源网荷储一体的自平衡体，解决区域能源在时间和空间上出现的不均衡，以及多个能源设施协同过程中能效、柔性、保供性能有待提升等问题，有效支撑区域能源按需运营，解开地方经济发展的能耗束缚，支撑地方经济的新旧动能转换。2023 年，建成集团首个园区级综合智慧零碳电厂样板间，构建技术、产品等一体化示范平台，组织编制并发布《综合智慧零碳电厂通则》（T/CIET 233-2023）、《虚拟电厂电锅炉系统可调节负荷监控与接口规范》（T/JSREA 27-2023）等 5 项国内综合智慧领域首个系列标准，为综合智慧能源创新发展提供有力支撑。

The energy revolution has been upgraded to the reconstruction of energy production and consumption modes instead of supply increase and efficiency improvement. Therefore, SPIC has introduced an energy supply solution. The Company has released the Technical Manual for SEP Development (2.0). Various resources such as new energy, energy storage, biomass, and adjustable load are aggregated by region to form a self-balancing pool integrating source, grid, load, and storage. This solution addresses energy imbalance from time and space perspectives, and meets the need to improve energy efficiency, flexibility, and supply performance when multiple energy facilities work cooperatively. It effectively allows the on-demand operation of regional energy, lifts the energy consumption constraints of local economic development, and facilitates energy transition to underpin the local economy. In 2023, we built the first park-level SEP prototype, established the integrated demonstration platform for technologies and products, prepared and issued the first five integrated smart energy standards such as the *General Rules for Smart Energy Prosumers (T/CIET 233-2023)*, the *Specification of Adjustable Load Monitoring and Interface for Virtual Power Plant Electric Boiler System (T/JSREA 27-2023)*, regulating the innovative development of integrated smart energy.

### 苏州综合智慧零碳电厂——全国首座接受省级电网调度的综合智慧零碳电厂

Suzhou SEP - The first SEP in China subject to provincial power grid dispatching



苏州综合智慧零碳电厂是全国首座接受省级电网调度的综合智慧零碳电厂，采用上海成套院自主研发的虚拟电厂技术开发建成，将客户末端负荷、各类分布式能源以市场化手段聚合起来，构建可调负荷资源池，直接接受电网调度，在供给侧、需求侧两端发力，积极探索参与响应服务、辅助服务、电力现货等市场模式。截至 2023 年底，项目总装机容量 91.4 万千瓦，具备顶峰能力 26.5 万千瓦，调峰能力 23.2 万千瓦，相当于传统火电 30 万千瓦机组出力，可补充苏州市约 10% 的电力缺口，年发绿电量约 6818 万千瓦时，可满足 3 万户家庭用电需求，减少二氧化碳排放约 6 万吨，相当于种植了 315 万棵树木，为电力系统提供可靠的灵活调节，保障了区域能源供应安全并且促进新能源消纳。

Suzhou SEP is the first SEP in China subject to provincial power grid dispatching. Building on the virtual power plant technology independently developed by the Shanghai Power Equipment Research Institute, Suzhou SEP aggregates user-end loads and various distributed energy sources from both supply and demand sides by market-oriented means to form an adjustable load resource pool, and is directly connected to the grid. It is actively involved in market modes such as response services, auxiliary services, and electricity spot trading. As of the end of 2023, the project has had the total installed capacity of 914 MW, a peak supply capacity of 265 MW, and a peak load management capacity of 232 MW, which is equivalent to a 300 MW traditional thermal power unit, and is sufficient to fill about 10% of the electricity gap in Suzhou. With annual green power generation of 68.18 GWh, this SEP can meet the electricity needs of 30,000 households and reduce carbon dioxide emissions by about 60,000 tons, which is equivalent to planting 3.15 million trees. The project enables reliable and flexible regulation of the power system, ensures regional energy supply security, and promotes new energy consumption.



国家电投浙江湖州综合智慧零碳电厂项目一期  
SPIC SEP Phase I in Huzhou, Zhejiang

## 氢能绿色氢能

## Hydrogen energy and green hydrogen-based energy

持续深耕氢能发展，围绕氢能产业链关键环节，聚焦核心技术自主化攻关，形成技术线与能源线协同发展格局，打造制氢—输氢—用氢产业链。

For the development of hydrogen energy, we focus efforts on the progress in the key links of the hydrogen energy industry chain, and the independent research and development of core technologies. We have formed a coordinated development pattern of technology lines and energy lines, and built a hydrogen production – hydrogen transmission – hydrogen use industry chain.



国家电投大安风光制绿氢合成氨一体化示范项目  
SPIC Da'an Demonstration Project of Green Hydrogen and Synthesis Ammonia Production with Wind and PV Power

## 技术突破 Technological breakthroughs

- 实现氢燃料电池从材料、部件到整堆系统全产业链自主可控；
- 自主研发“氢腾”燃料电池、“斯帛”碳纸等系列核心技术产品，建成国内首条自主化质子交换膜生产线和超高温、大幅宽碳纸生产线；
- 上线全国首台氢燃料电池混合动力机车，搭载“氢腾”电池氢能大巴已为北京冬奥会等重要活动提供高质量服务；
- 自主研发的“氢涌”质子交换膜电解水（PEM）制氢电解槽系列产品投入示范应用，获得国家能源局首台（套）重大技术装备认定。

Achieve independent control of the entire industry chain of hydrogen fuel cells covering materials, components and stack systems;

Independently develop a series of core technology products such as “Hydrogen Forerunner” fuel cells and “SPIPA” carbon paper; build the first domestic independent proton exchange membrane production line and the ultra-high temperature and wide carbon paper production line;

Launch the first hydrogen fuel cell hybrid locomotive in China, and the buses equipped with “Hydrogen Forerunner” fuel cells that have served the Beijing Winter Olympics, and other important events well.

Put the independently-developed “Hydrofore” series proton exchange membrane (PEM) water electrolyzers for hydrogen production into demonstration application, which has been recognized as the first major technical equipment by the National Energy Administration.

发力“绿电交通”，国家电投黑龙江鹤岗中国五矿项目矿卡换电站  
“E-mobility”: SPIC Battery Swap Station for China Minmetals Project in Hegang, Heilongjiang

## 能源互联 Energy interconnection

- 以绿氢为核心纽带，围绕集中式、规模化新能源开发，解决上游新能源大规模消纳问题，探索向下游转化形成甲醇、氨、航空煤油等绿色燃料，降低能源对外依存度；
- 攻关相关关键技术，开工建设全球规模最大风光制绿氢合成氨一体化示范项目，获批国家级示范应用工程。

We are committed to centralized and large-scale new energy development, focusing on the green hydrogen sector. On the one side, we explore the hydrogen-based e-fuels such as methanol, ammonia, and sustainable aviation fuel (SAF) in the downstream, lessening imported energy dependence.

We have tackled key technologies, and commenced the world's largest demonstration project of green hydrogen and synthesis ammonia production with wind and PV power that has been approved as a national demonstration application project.

## 储能

## Energy storage

瞄准未来电力系统场景需求，综合布局压缩空气、液流电池等产业化储能关键技术及示范项目。

Targeting the needs of future power system scenarios, we deploy key technologies and demonstration projects for industrialized energy storage such as compressed air and flow cells.



国家电投甘肃通渭县压缩空气+锂电池组合式网侧共享储能电站创新示范项目

SPIC Compressed Air + Lithium Battery Combined Grid-side Shared Energy Storage Station Innovation Demonstration Project in Tongwei County, Gansu

### 全国首个三模混合储能项目在内蒙古霍林郭勒投运

The first three-mode hybrid energy storage project in China was put into operation in Hologol, Inner Mongolia



2023年8月19日，我国首个由铁-铬液流电池、飞轮、锂电三种形式组成的混合储能项目投运。项目位于内蒙古霍林郭勒市循环经济产业园区，建设装机容量为0.3万千瓦铁-铬液流电池、飞轮、锂电三种形式混合式储能系统。

On August 19, 2023, the first hybrid energy storage project in China consisting of iron-chromium flow cells, flywheels and lithium cells was put into operation by SPIC Inner Mongolia Electric Power Branch. Located in the Circular Economy Industrial Park, Hologol, Inner Mongolia, the project involves a 3 MW hybrid energy storage system consisting of iron-chromium flow cells, flywheels and lithium cells.

### 生物质能

### Biomass energy

孵化生物质能创新产业，攻克生物质黑颗粒高温水洗等核心技术，自主研发的生物质绿能颗粒首台套撬装移动生产线“秸能一号”，完成主系统连续稳定运行，为后续规模化应用推广奠定了技术基础和示范支撑。

SPIC has incubated biomass energy innovation industries, and conquered core technologies such as high-temperature water washing of biomass black particles. The main system of the first skid-mounted mobile production line for biomass green energy particles independently developed by SPIC, "Jieneng One", completed the continuous and stable operation. "Jieneng One" lays the technical foundation and demonstration support for subsequent large-scale application and promotion.

## 共赴崭新未来

“创新”“融合”是国家电投的企业核心价值观。在“建设具有全球竞争力的世界一流清洁能源企业”的征程上、在“创造绿色价值”的道路上，国家电投坚持向新发展、合作发展，提质增效，与各方共绘发展新蓝图。

## Cooperation for Bright Future

SPIC's core values lie in innovation and integration. SPIC strives to be a world class clean energy company with global competitiveness, and create green value. To this end, SPIC is committed to making fresh progress through cooperation, advancing quality and efficiency improvement, and charting a new blueprint for development with all parties.

## 拥抱数智新未来

## Embracing the Digital and Intelligent Future

国家电投深入贯彻落实习近平总书记提出的“数字中国”战略，以数字化转型驱动公司治理能力提升、产业生产方式和运营模式变革，持续打造“数字国家电投”发展新优势。开展公司数字化顶层设计深化优化，大力推进公司ERP系统、工业互联网+安全生产平台、数据中台等重点项目建设，开展大数据审计等数据应用。制修订数字化制度3项、管理标准5项；组织开展二级单位年度数字化工作监督检查；开展数字化转型培训、数字化专项培训、网络安全防护专题培训、数字化素养宣贯等；选拔数字化专业骨干人才，制定人才建设和使用管理工作方案，完成首批174人入库建档。

Aligning with the "Digital China" strategy proposed by President Xi Jinping, SPIC leverages digital transformation to drive corporate governance improvement, and transformation of production and operation models, and continues to foster new development advantages for "Digital SPIC". We deepen and optimize our top-level digital design, push forward with major projects such as the ERP system, industrial Internet + production safety platform, and data center, and carry out data applications such as big data auditing. We have formulated and revised 3 digitalization regulations and 5 management standards; organized annual digital work supervision and inspection among our subsidiaries and affiliates, conducted digital transformation training, targeted digital training, cyber-security protection training, and digital literacy education; selected digital backbone talents, worked out talent development and use management plans, and included 174 talents into the talent pool.

国家电投国能单县生物发电有限公司生物质发电项目  
Biomass Power Generation Project in Shankian County Invested by Biomass Power Generation Company of SPIC National Bio Energy

## 打造数字平台 Building Digital Platforms

国家电投进一步发挥数字化在公司一流战略落地过程中的先进生产力作用，开展数字技术与实体经济融合模式研究，积极探索数字化在引领用户侧综合智慧能源、绿电转化等新兴产业和集中式电热力等绿色清洁产业的着力点，以新质生产力赋能企业高质量发展。

SPIC continues to play the advanced productivity role of digitalization in implementing first-class strategies, conducts research on the integration models of digital technology and real economy, and actively explores the strength of digitalization in leading emerging industries such as user-side integrated smart energy and green power to X, and green and clean industries such as centralized power and heat generation, so as to enable high-quality development with new quality productive forces.

### 全球司库系统 Global treasury system

国家电投建设了以“全球化资金管理、银行化金融服务、可视化运营管控、场景化智慧应用”四大子系统为核心的全球司库系统，覆盖公司境内外全级次单位，实现公司资金金融资源的全流程、线上化、实时化管控，在资金金融资源集约管理、债务成本压降、资金风险防控等方面取得了显著成效，持续发挥央企司库建设先行者和策源地的示范作用。2023年，国家电投开启司库系统二期建设新征程，以“支撑2035世界一流战略的数智化司库”为目标，全面建设智慧应用子系统。移动应用方面，率先采用金融级移动互联网开发平台搭建掌上司库，各单位资金情况触手可达、尽在“掌”握。资金监督方面，率先建成智慧监督平台，智慧赋能、技术先进、独立部署，向数智化司库转型升级。数智技术方面，搭建采、存、管、算、用一体化司库数据平台，搭建云、大、物、移、智新技术平台。

SPIC has established a global treasury system that consists of four sub-systems, namely, global fund management, bank-based financial services, visualized operation control, and scenario-based smart applications. Covering our domestic and overseas entities at all levels, the system is designed for full-process, online, and real-time control of our funds and financial resources, and does a good job in the intensive management of funds and financial resources, debt cost reduction, and fund risk prevention and control. With this system, we keep playing a demonstration role as a pioneer of the SOE treasury system. In 2023, SPIC started Phase II of this treasury system, namely, a smart application sub-system, with the goal of “a digital treasury supporting the World-class Strategy 2035”. In terms of mobile application, we take the lead in building a hand-held treasury by leveraging the financial-grade mobile Internet development platform, allowing easy access to the financial position of each subsidiary. For fund supervision, we were the first to build an independent smart supervision platform that is technically advanced, upgrading our treasury digitally and intelligently. Regarding digital and intelligent technology, we have built a treasury data platform integrating procurement, storage, management, calculation and use as well as a new platform consisting of cloud, big data, IoT, mobile Internet, and intelligent technologies.

### 电投云 SPIC Cloud

建成公司新型数字化基础设施——贵安数据中心，已部署1458个标准机柜、647台物理设备，云计算平台（电投云）投入运行，完成电投壹、综合办公等78套集团化应用系统从北京苏州街数据中心搬迁至贵安数据中心，为集团各应用平台提供高效、灵活、可靠的计算和存储资源。目前，电投云已完成信息内、外网两个云平台节点建设，可提供各种类型的IaaS资源，当前总资源为66048核CPU、153888G内存、5890T存储资源。

We have established a new digital facility, Gui'an Data Center. The center has been equipped with 1,458 standard cabinets and 647 physical devices. The cloud computing platform (SPIC Cloud) has been put into operation. 78 sets of the Group's application systems such as Dian Tou Yi and Integrated OA have been transferred from Beijing Suzhoujie Data Center to Gui'an Data Center. This new center provides efficient, flexible, and reliable computing and storage resources for the Group's application platforms. At present, SPIC Cloud has completed cloud platform nodes for internal and external information networks, and provides various types of IaaS resources. The current total resources include 66048-core CPU, 153,888 GB memory, and 5,890 TB storage resources.



国家电投贵安数据中心  
SPIC Gui'an Data Center

## 深挖数据价值 Digging Data Value

国家电投把握数字经济发展机遇，加速提升企业创新能力，充分挖掘数字化在企业经营和产业创新中的价值，形成内外部连接、共享、协同机制，实现降本增效、协同共享、持续创新、风险预控和智慧决策。

Embracing the development opportunities of the digital economy, SPIC accelerates its pace to enhance innovation capabilities, fully explores the value of digitalization in corporate operation and industry innovation, and forms sharing and coordination mechanisms connecting internal and external resources in order to enable cost reduction and efficiency improvement, collaborative sharing, continuous innovation, risk prevention and smart decision-making.

## 产业数据中台 Industry data center

国家电投产业数据中台采用“一级部署，三级应用”模式构建，已成为全球最大的集团化新能源数字化平台，初步实现产业数据“上云、用数、赋智”。风、光、火、水、核、煤炭、铝业、环保等全产业链数据全面汇聚、开放共享，打造决策分析典型场景应用。截至 2023 年 12 月底，累计接入境内场站 1848 座，装机超 2.14 亿千瓦。基于产业数据中台深化数据应用，开展数据价值挖掘，完成 188 个场站无故障场站应用部署，整体提升新能源资产预警管理准确率和缺陷闭环处理效率，支撑集团风、光损失电量专项治理，挽回电量损失约 5.2 亿千瓦时。

The industry data center is established by the “one-level deployment, three-level application” model. The center has been the world’s largest group-based new energy digital platform, initially realizing cloud-based, digital and intelligent management of industry data. It pools and shares data of all fields such as wind, PV, thermal, hydropower, nuclear, coal, aluminum, and environmental protection, and allows typical scenario applications for decision-making analysis. As of the end of 2023, the center has been connected to 1,848 domestic stations, with an installed capacity of over 214 GW. By leveraging the industry data platform, we deepen data application, and dig data value. Fault-free application deployment has been made in 188 stations. The platform has improved the overall accuracy of new energy asset warning management and closed-loop defect processing efficiency, and supported the management of wind and PV power curtailment, thus recovering about 520 GWh of power loss.

## 天枢体系 Dubhe system

国家电投天枢体系已完成“云、网、边、端”的系统构建，聚焦用户侧需求持续迭代升级，对于构建新型能源体系、提升清洁能源使用效率、做好碳排双控管理、推动“双碳”目标实现、助力高质量发展及乡村振兴具有重要价值。截至 2023 年 12 月，天枢系统已部署在全国 30 个省市自治区、1598 个县域，接入光伏逆变器、制冷设备、储能设备及其他设备数量 70 多万台，设备物联测点超 2.2 亿个，日峰值在线设备数量 66 万台，接入各类能源设施容量超过 0.35 亿千瓦。

SPIC has completed the construction of “cloud, network, edge, and terminal” facilitates for its Dubhe system, and keeps upgrading the Dubhe system catering to user-side needs. It plays an important role in building a new energy system, enhancing clean energy use efficiency, promoting carbon emission dual-control, boosting the realization of “dual carbon” goals, and driving high-quality development and rural revitalization. As of December 2023, the Dubhe system has been applied in 1,598 counties out of 30 provinces/municipalities/autonomous regions, and has been connected with more than 700,000 sets of PV inverters, refrigeration equipment, and energy storage equipment. There are over 220 million equipment IoT measuring points, and 660,000 online equipment during daily peak hours. The capacity of various energy facilities has exceeded 35 GW.

## 创享互利新未来 Sharing a Mutually-beneficial Future

国家电投秉承“公开、公平、公正”原则，坚持阳光、合规、绿色采购，致力于与供应商建立良好合作伙伴关系，推动供应链可持续发展；遵守行业规范和商业道德，构建起公开、透明的竞争机制，积极开展与各方伙伴的沟通交流与互利合作，通过优势互补，合力推动发展共赢。

SPIC adheres to clean, compliant, and green procurement following the principles of openness, fairness and justice, and strives to establish sound partnerships with suppliers to promote the sustainable development of the supply chain. Abiding by industry norms and business ethics, we have built an open and transparent competition mechanism, and stepped up communication and mutually-beneficial cooperation with all partners by complementing each other’s advantages.

## 建设责任供应链 Fostering a Responsible Supply Chain

国家电投将供应商视为共同创造辉煌事业的同行伙伴，持续加强供应商建设与管理，制定《供应商管理办法》，全面优化完善供应商评价管理体系，指导各级单位对供应商开展不良行为处置和供应绩效评价管理，引导供应商规范履职。

SPIC is willing to join hands with suppliers to embrace a brilliant future. For this purpose, we continuously strengthen supplier development and management, introduce the *Supplier Management Measures*, optimize the supplier evaluation management system, and guide subsidiaries at all levels to punish suppliers for their misconduct and practice effective supplier performance evaluation management in order to ensure suppliers perform their duties properly.

## 联合多方齐发展 Moving Forward Together with Multiple Parties

高扬互利共赢之帆、把稳团结合作之舵。国家电投坚持凝聚协同奋进之力，积极拓展国内外合作“朋友圈”，拓展与政府、企业、科研院所、高校的合作，巩固和深化伙伴关系，携手谱写互惠共赢的合作新篇章。截至 2023 年 12 月，公司审批、签订及生效中合作协议 309 项，其中国内外企业 169 项，政府、事业单位、机构、社会团体和高校及科研院所 140 项。

Upholding cooperation for mutual benefits, SPIC stays committed to expanding and consolidating cooperative ties with governments, enterprises, research institutes, and universities at home and abroad to embrace a common future. As of December 2023, the Company has approved, signed and performed 309 cooperation agreements, including 169 with domestic and foreign enterprises, and 140 with governments, public institutions, organizations, social groups, universities and research institutes.

# 04

## 治理现代 以高质量发展 勇创世界一流

国家电投认真贯彻落实习近平总书记在中央经济工作会议上的重要讲话精神，紧紧围绕“加快建设世界一流企业”总目标，持续推进中国特色现代企业制度落实落地，全面提升治理效能，在中国式现代化建设中展现新作为，为全面建设社会主义现代化国家作出新的更大贡献。

### Modern Governance High-quality Development for a World-class Business

SPIC conscientiously implements the important speeches of President Xi Jinping at the Central Economic Work Conference, focusing closely on the general goal of accelerating the development of a world-class enterprise. SPIC continuously promotes the implementation of a modern business system with Chinese characteristics, comprehensively enhances governance efficiency, showcases new achievements in Chinese modernization drive, and makes new and greater contributions to building a modern socialist country in all respects.



国家电投贵州三板溪水电站

SPIC Sanbanxi Hydropower Station in Guizhou



国家电投内蒙古公司通辽热电公司面对暴雪，组织“暖流先锋突击队”第一时间对进煤铁路专线积雪进行清理，以实际行动保障通辽市主城区 24 万热用户稳定用热

Facing heavy snowfall, SPIC Inner Mongolia Electric Power Tongliao Thermal Power Company dispatched the Warm Current Vanguard Task Force to promptly clear the snow from the coal transportation railway line, ensuring stable heating for 240,000 users in the main urban area of Tongliao through practical actions

## 完善公司治理

国家电投持续推进企业治理体系和治理能力现代化，切实将党的领导融入公司治理，不断加大法律合规、风险内控工作穿透力度，积极应对外部挑战，加快高质量发展步伐。

## Better Corporate Governance

SPIC persistently advances the modernization of its corporate governance system and governance capabilities. It effectively integrates the leadership into corporate governance, continuously strengthens the depth of legal compliance and internal risk control efforts, actively responds to external challenges, and accelerates the pace of high-quality development.

## 坚持党建引领

国家电投坚持以党的政治建设为统领，以习近平总书记关于党的建设的重要思想为根本遵循，以深入推进学习贯彻习近平新时代中国特色社会主义思想主题教育和学习宣传贯彻党的二十大精神为主线，深入贯彻落实党中央决策部署，认真履行管党治党主体责任，党的领导作用有效彰显，党建工作质效持续提升。

2023 年，国家电投获中央企业党建责任制考核 A 级，实现连续四年在国资委党建责任制考核中获评 A 级。

### 扎实开展学习贯彻习近平新时代中国特色社会主义思想主题教育



2023 年 4 月 12 日，国家电投召开学习贯彻习近平新时代中国特色社会主义思想主题教育动员大会，深入学习贯彻习近平总书记中央主题教育工作会上的重要讲话精神，全面贯彻落实党中央各项部署要求。国家电投党组牢牢把握“学思想、强党性、重实践、建新功”总要求，聚焦“以学铸魂、以学增智、以学正风、以学促干”，高标准高质量推进第一批主题教育，有序有效抓好两批衔接，国家电投上下在理论学习中锤炼了党性修养，在调查研究中转变了工作作风，在推动发展中坚定了信心决心，在检视整改中查找了差距不足，进一步焕发出为我国能源安全、创新发展争当“排头兵”“先行者”的担当情怀，相关工作得到中央指导组高度肯定。主题教育开展以来，国家电投各级党组织举办专题读书班 2230 场、专题研讨 2717 次。

## 完善法人治理 Improving Corporate Governance

国家电投贯彻落实习近平总书记“两个一以贯之”重要论述，在完善公司治理中加强党的领导，完善中国特色现代企业制度，建立权责法定、权责透明、协调运转、有效制衡的公司治理机制。持续加强总部董事会建设，董事会完整、准确、全面贯彻新发展理念，积极发挥定战略、做决策、防风险职能，推动公司高质量发展；打造一支德才兼备、业务精通、勤勉尽责、勇于担当的专职董事队伍，行使和保证公司作为出资人的权利，为建设世界一流企业提供有力支撑；持续推动各级子企业董事会制度更加健全、运行更加规范、作用发挥更加充分，提升子企业董事会依法履职行权能力，将制度优势更好转化为治理效能。

SPIC implements the important remarks of President Xi Jinping that SOEs shall uphold the leadership of the CPC, and develop the modern corporate system with Chinese characteristics. The Company has established a corporate governance mechanism with law-based and transparent rights and responsibilities, coordinated operation, and effective check and balance. We continue to strengthen the development of the Board of Directors in the headoffice. We see that the Board of Directors fully, accurately and comprehensively implements the new development vision, and actively fulfills the duties of devising strategies, making decisions and preventing risks in order to promote the high-quality development of the Company. We strive to cultivate full-time directors who have both moral integrity and ability, keep proficient in business, remain diligent, and live up to their responsibility. These directors exercise and guarantee the rights of the Company as an investor, and provide strong support for building a world-class enterprise. We ensure the boards of directors of subsidiaries at all levels operate soundly and effectively, and perform their duties fully and legally to translate the institutional advantages into governance efficiency.

国家电投马耳他德利马拉三期电站  
SPIC Malta Delimara Phase III Power Plant

## 强化风险管控 Strengthening Risk Control

国家电投坚决贯彻党中央防范化解重大风险决策部署，按照国资委“强内控、防风险、促合规”有关要求，全面系统推进风险防控工作。着力健全重大经营风险预测评估机制，扎实推进“一企一策”精准防控，压实各级责任主体风险防控责任。强化风险日常跟踪监测，突出重点、精准施策，狠抓防控措施落地见效，持续推动风险管理质量成效稳步提升，年度各项重大风险可控在控。强化审计第三道防线，建立健全集团党组、董事会直接领导下的内部审计体制，打造审计部、审计中心、审计人才库“一体两翼”人才架构，坚持科技强审理念，建设大数据审计平台，创新重大项目投资审计监督体系，完善整改追责长效机制等。

SPIC resolutely implements the guiding principles of preventing and defusing major risks, and pushes forward with risk prevention and control comprehensively and systematically according to the requirements of the SASAC to “strengthen internal control, guard against risks, and promote compliance”. Efforts have been intensified to refine the prediction and assessment mechanisms of major business risks, implement precise prevention and control policies tailored to enterprises, namely one policy for one enterprise, and see that risk prevention and control responsibilities are fulfilled well at all levels. We have strengthened daily tracking and monitoring of risks, put risk prevention and control measures in place, especially major and targeted measures, and promoted the steady improvement of risk management in quality and efficiency constantly, thus making all major risks under control. Moreover, we have made sustained efforts to step up the third defense line of audit, establish and improve the internal audit system under the direct leadership of the Group’s Leadership and the Board of Directors of the Group, and develop a “one body, two wings” talent structure covering the department of auditing, the auditing center, and the auditing talent pool. Underlining science and technology in auditing, we have established the big data audit platform, introduced the new audit supervision system of major project investments, and upgraded the long-term mechanism for rectification and accountability.

## 做好巡视整改

国家电投扎实做好巡视“后半篇文章”，把中央巡视反馈问题整改作为重要政治任务，以坚决态度、严格要求、扎实举措抓整改。第一时间成立巡视整改工作领导机构、工作专班，制定整改方案，建立“三张清单”，坚持党组抓总、党组成员分头负责、总部部门和各二级单位党组织各负其责，各级纪检监察机构履行整改监督责任，从一开始就把整改责任担起来、整改标准高起来、整改措施实起来，“实打实、硬碰硬”抓整改。以整改方案为纲，运用6个方面12项工作机制，特别是“1+3+6”落实机制，针对38个问题149项整改措施，挂图作业，每周跟进，实现任务管理“工程化”、进度质量“图表化”、具体行动“清单化”，形成了纵向贯通、横向协同、真改实改工作格局，切实以高标准整改推动高质量发展。

## 严格依法合规

国家电投深入学习贯彻习近平法治思想，聚焦增强核心功能、提高核心竞争力，紧扣“五个体系、五种能力”要求，对标国内外一流法治企业，持续深化法治央企建设，不断优化企业合规管理体系，全面强化规章制度执行，严格依法合规经营管理，将法律合规要求内嵌到企业决策和经营业务全流程，贯穿到各层级、各业务、各岗位，法治思维和法治方式体现于企业决策、执行、监督各环节，全员法治意识不断增强、法治素养持续提高，形成遵法纪、重合同、守信用的良好法治氛围，依法管理、诚信经营成为企业重要特质。

## Stricter Compliance with Laws

SPIC has fully implemented Xi Jinping's thoughts on the rule of law. To enhance core function and core competitiveness, we continue to deepen the development of a law-based SOE following the requirements of "five systems and five capabilities", and referring to the standards of first-class law-based enterprises at home and abroad. We constantly optimize the corporate compliance management system, comprehensively strengthen the implementation of rules and regulations, and strictly operate in accordance with laws and regulations. We incorporate compliance requirements into corporate decision-making and business operation, and into positions at all levels and all business verticals. We apply the rule of law thinking and methods in corporate decision-making, execution, and supervision, help all employees enhance the rule of law awareness and literacy, and foster a workplace where laws and contracts are abided by in good faith. Law-based and honest management has been our important corporate characteristic.

## 深化企业改革

2023年，国家电投乘势而上，在新一轮国企改革三年改革中，精心谋划部署，严密组织实施，以提升核心竞争力、增强服务国家战略等核心功能为重点，进一步巩固国企改革三年行动成效，扎实推动新一轮深化改革提升行动，实现高质量起步开局。

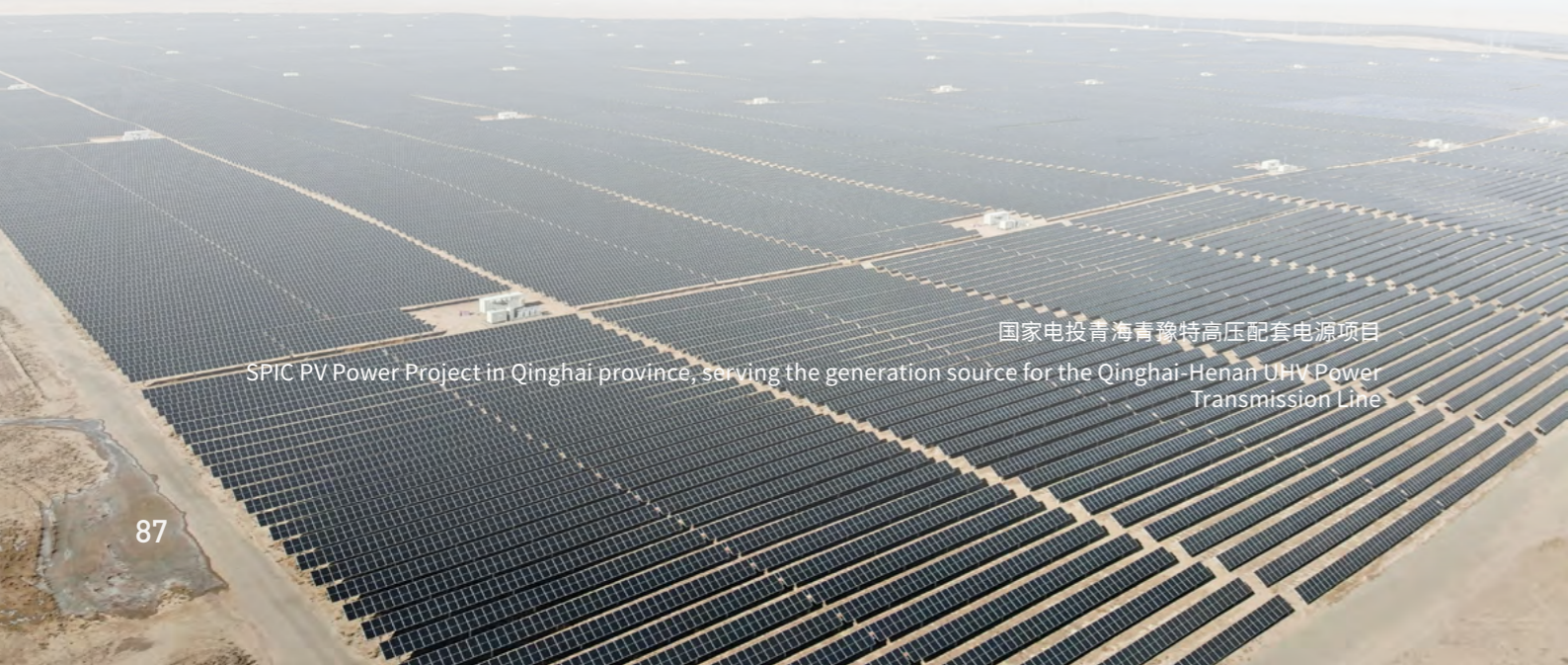
## Extensive SOE Reform

In 2023, SPIC seized the momentum and carefully planned and organized its efforts during the new round of the three-year SOE reform. The focus was on enhancing core competitiveness and contributing to national strategies. This approach aimed to consolidate the achievements of the three-year SOE reform action plan and solidly promote the new round of deepening reform and enhancement actions, to achieve a high-quality start.

## 深刻领会新一轮改革精神 Deep Understanding of the Latest Round of Reform

国家电投党组将国企改革深化提升行动作为重要的政治责任和政治任务，多次组织务虚研讨会、专题会，围绕提高核心竞争力、增强核心功能，针对方案逻辑架构、总体思路、举措内容开展深入讨论，完善改革方案，持续提升方案质量和可操作性。国家电投改革深化提升行动实施方案既承接了国家战略部署又解决集团突出问题，并提出了在增强服务国家战略功能作用、真正按市场化机制运营等方面需取得明显成效的总目标和8个方面36项改革举措，改革方案得到国资委改革办肯定。

SPIC's Leadership regards the action plan of deepening and upgrading SOE reform as a significant political responsibility and task. They organized multiple theory-discussing and special meetings to discuss and refine the reform plan, focusing on improving core competitiveness and enhancing core functions. The discussions covered the logical framework, overall approach, and content of measures, in a bid to continuously improve the quality and operability of the reform plan. The implementation plan for SPIC's deepening reform enhancement action not only aligns with national strategic deployments but also addresses the prominent issues within the group. It outlines a total goal of achieving significant results in enhancing the function of serving national strategies and truly operating under market mechanisms, with 36 reform measures across eight areas. This reform plan has been endorsed by the Reform Office of the SASAC.



国家电投青海青豫特高压配套电源项目  
SPIC PV Power Project in Qinghai province, serving the generation source for the Qinghai-Henan UHV Power Transmission Line

## 推进提质扩面建设新国企 Advancing Quality Improvement and Expansion to Build a New Type of SOE

- **强化对标引领。** 构建对标管理体系，牵引企业持续提升效率，通过全员劳动生产率“硬”约束方式，解绑“用工”手脚，实现自主确定用工。分类管理精准施策，将用工管理分为备案制和核准制，分类制定效率与用工管理模式。

**Improving Led by Benchmarking:** Establish a benchmarking management system to continuously improve efficiency in the enterprise, and impose “hard” constraints on labor productivity for all employees, to liberate the constraints on “employment” and achieve autonomous employment determination. Conduct classified management with tailored measures, by classifying employment management into record-based and approval-based systems, and develop efficiency and employment management models accordingly.

- **完善激励约束。** 强化精准考核机制，将提升目标纳入二级子企业年度综合业绩考核责任书。健全薪酬挂钩机制，工资总额增幅在与净利润挂钩、利润总额挂钩的基础上，与人力资源投入产出效率强联动。将“效率决定用工、效率调整薪酬”作为基层单位三项制度改革核心评估指标。

**Improving Incentives and Constraints:** Strengthen the precision evaluation mechanism by incorporating improvement targets into the annual comprehensive performance evaluation responsibility agreements for secondary subsidiaries. Enhance the remuneration linkage mechanism by ensuring that the increase in total wages is strongly linked not only to net profit and total profit but also to the efficiency of human resource input and output. Establish “efficiency determines employment and efficiency adjusts remuneration” as core evaluation indicators for the three institutional reforms at the grassroots level.

- **建立改善路径。** 坚持问题导向明确效率提升路径，明确通过加大传统产业升级力度、做优新兴产业增量、加快推进科技创新、深化三项制度改革、加强员工能力建设、规范业务外包管理、开展区域统筹等 7 项措施持续提升企业效率。坚持标杆引领营造创先争优氛围，打造样板间，总结良好实践形成可复制的经验进行推广。聚焦业务外包规范管理，坚持“能干不包”，对业务外包项目开展解剖麻雀式自查，将业务外包费用纳入 JYKJ 体系，业务外包规范管理 9 家试点单位中效果最明显的河南沁阳发电预计 2023 年业务外包费用较同期同口径压降 38%，人工成本压降 40%，实现劳动生产率提高 150%。

**Establishing Improvement Pathways:** Adhere to a problem-oriented approach to clarify pathways for efficiency improvement, and enhancing corporate efficiency through seven measures: intensifying upgrades of traditional industries, optimizing the growth of emerging industries, accelerating technological innovation, deepening reforms of the three institutional mechanisms, strengthening employee capacity building, standardizing business outsourcing management, and implementing regional coordination. Adhere to benchmarking leadership to create an atmosphere of striving for excellence, establish exemplary models, and summarize best practices to promote replicable experiences. Focus on standardized management of business outsourcing. Follow the principle – “If it can be done internally, don’t outsource.” Conduct detailed self-assessments of business outsourcing projects and include business outsourcing costs in the JYKJ system. Among the nine pilot subsidiaries for standardized management of business outsourcing, Henan Qinyang Power Generation is expected to achieve the most significant results in 2023, with a 38% reduction in business outsourcing costs and a 40% reduction in labor costs compared to the same period last year, leading to a 150% increase in labor productivity.

## 国企改革行动高质量收官 High-quality Conclusion of SOE Reform Actions

2023 年 5 月，国务院国资委组织对中央企业所属“双百企业”“科改企业”2022 年度改革创新情况进行专项考核，共 254 户“双百企业”、274 户“科改企业”纳入此次专项考核。国家电投所属 7 户“双百企业”“科改企业”专项考核结果全部为“标杆”或“优秀”，在央企中名列前茅。6 月，国家电投在国务院国资委 2022 年度中央企业改革三年行动重点任务考核中获评 A 级企业，整体考核名列央企第三名，11 项重点任务中 3 项第一、6 项前十，实现国企改革三年行动圆满收官。

In May 2023, SASAC conducted a special assessment of the reform and innovation status of the “Double Hundred Enterprises” and “Scientifically-reformed Enterprises” under SOEs for the year 2022. A total of 254 “Double Hundred Enterprises” and 274 “Scientifically-reformed Enterprises” were included in this assessment. All seven of SPIC’s “Double Hundred Enterprises” and “Scientifically-reformed Enterprises” achieved “Benchmark” or “Excellent” ratings, ranking among the top in SOEs. Among these, SPIC Inner Mongolia Electric Power, SPIC China Power International Development, and SPIC Shanghai Electric Power were all rated as Benchmark in the “Double Hundred Enterprises” category. In the “Scientifically-reformed Enterprises” category, Zhongneng Integrated, SPIC Hydrogen Energy, and XYZ Storage were all rated as “Benchmark”. In June, SPIC was rated as an A-level enterprise in the 2022 Annual Key Tasks Assessment of the Three-year SOE Reform Action by SASAC, ranking third overall among SOEs. SPIC achieved first place in three of the eleven key tasks and ranked in the top ten for six tasks, successfully concluding the three-year SOE reform action.

### 国家电投改革经验入编《国企改革三年行动简报》

SPIC's reform experience featured in the *Brief of the Three-year Action on SOE Reform*



2023 年 10 月，国家电投启动“效率决定用工、效率调整薪酬”人力资源管理体制机制改革工作，基于“分类授权+互利共享”的管理理念，跳出用工管理围栏，不再核定用工计划，通过人工成本投入产出行业内外对标情况，以全员劳动生产率提升为牵引，倒逼企业以价值创造提效率，以效率提升换资源。明确通过加大传统产业升级力度、做优新兴产业增量、加快推进科技创新、深化三项制度改革、加强员工能力建设、规范业务外包管理、开展区域统筹等 7 项措施持续提升企业效率。改革经验在《国企改革三年行动简报》2023 年第 83 期进行了刊发。

In October 2023, SPIC initiated the human resources management system reform under the principle – “Efficiency determines employment and efficiency adjusts remuneration.” Based on the management philosophy of “categorized authorization + mutual benefit sharing”, SPIC moved beyond traditional employment management constraints by no longer setting fixed employment plans. Instead, it utilized industry internal and external benchmarking of labor cost input and output to drive enterprises to improve efficiency through value creation, thereby exchanging resource gains for enhanced efficiency. Clearly defined measures to continually enhance corporate efficiency include upgrading traditional industries, optimizing the growth of emerging industries, accelerating technological innovation, deepening the reform of the three key systems, strengthening employee capacity building, standardizing business outsourcing management, and implementing regional coordination. The goal is to achieve a positive correlation between the overall labor productivity of all employees and their remuneration levels at the subsidiaries and affiliates within three to five years. These requirements will be applied across all subsidiaries and affiliates within the Company. The reform experience was published in the 83<sup>rd</sup> issue of the *Brief of the Three-year Action on SOE Reform* in 2023.

## 责任专题

### 守青护绿，呵护原生态人与自然共和谐

绿水青山就是金山银山。国家电投把提升生态环境治理现代化水平作为落实党的二十大精神的重要举措，全力以赴推进生态文明建设，积极开展荒漠化治理、矿山生态修复和生物多样性保护等举措，促进人与自然和谐共生，让良好生态环境成为经济社会持续健康发展的支撑点。

### 鼎力保供，能源“国家队”倾力攻坚勇担当

面对瞬息万变的能源市场和艰巨繁重的生产经营任务，国家电投在能源保供的道路上始终如一，从烈日炎炎到寒风凛冽，坚定不移地用行动和付出书写着无畏和奉献，用责任和担当诠释着“真信、真干、真成”的信念，身体力行、攻坚克难，全力守护万家温暖，战风斗雪、不辍脚步，奏响“能源保供”胜利凯歌。

### 追求卓越，董事会建设“探路过河”创范本

建设“一流水平董事会”是国家电投对中国特色现代企业制度的实践探索，是实现国家电投“2035 一流战略”和“十四五”规划的重要抓手。2023 年，国家电投不断探索公司治理新范式，建设“学习型、战略型、创新型”董事会，使党组、董事会、经理层同频共振，全面提升治理效能，以一流的现代治理能力助推世界一流清洁能源企业目标实现。

国家电投澳大利亚柯丁顿风电场  
SPIC Coddington Wind Power Project in Australia

## Cases of Responsibility

### Protecting the environment to allow harmony between human and nature

Clear waters and green mountains are as valuable as gold and silver mountains. SPIC views enhancing the modernization of ecological environment governance as a critical step in implementing the 20<sup>th</sup> National Congress of the CPC initiatives. The Company is fully committed to advancing ecological civilization by actively engaging in desertification control, mine ecological restoration, and biodiversity protection, fostering harmonious coexistence between humans and nature, and making a healthy ecological environment a cornerstone of sustainable economic and social development.

### Taking on challenges to ensure energy supply as a SOE

Facing the rapidly changing energy market and the daunting tasks of production and operations, SPIC remains unwavering on the path of ensuring energy supply. From scorching heat to biting cold, the Company consistently demonstrates courage and dedication through actions and efforts. They embody our core values “Deliver Great Performance with Belief, taking practical steps to overcome challenges, safeguarding warmth for millions of households, battling wind and snow without pause, and triumphantly playing the victory anthem of “energy supply assurance”.

### Blazing a trail in modern corporate governance to pursue excellence

Building a “first-class board of directors” is SPIC’s practice and exploration of the modern enterprise system with Chinese characteristics. It is a crucial element in realizing the “World-class Strategy 2035” and the 14<sup>th</sup> Five-Year Plan. In 2023, SPIC continuously explored new paradigms in corporate governance, establishing a learning, strategic, and innovative board of directors. This ensures alignment and resonance among the Leadership, the board of directors, and the management team, comprehensively enhancing governance efficiency. With first-class modern governance capabilities, SPIC aims to achieve the goal of becoming a world-class clean energy enterprise.



“码”上阅读完整版责任专题  
Scan the QR code to read the full section on Cases of Responsibility

## 责任管理 CSR Management

国家电投坚决贯彻落实“四个革命、一个合作”能源安全新战略，聚焦“双碳”目标，以“创造绿色价值”为使命，践行“绿色、创新、融合，真信、真干、真成”企业核心价值观，努力和每一个利益相关方携手共建美丽中国、共享低碳生活、共迎幸福未来。

SPIC steadfastly implements the new energy security strategy of “Four Revolutions, and One Cooperation”, focusing on the dual-carbon goals. With a mission to create green value, SPIC practices its core corporate values “Pursue Green, Innovative and Integrated Development; Deliver Great Performance with Belief”. It strives to collaborate with all stakeholders to jointly build a beautiful China, share a low-carbon lifestyle, and embrace a prosperous future.

## 责任治理 CSR-based Governance

国家电投不断夯实社会责任治理体系建设，完善社会责任组织体系，建立社会责任领导机构，总部各部门及所属单位设置社会责任联络人；建立跨部门的社会责任管理、协调推进工作机制，确保责任工作落到实处；制定《国家电力投资集团有限公司社会责任管理规定》，规范公司社会责任管理工作；制定社会责任工作年度计划，明确年度社会责任工作重点，并跟进计划执行情况；结合业务运营实际，建立健全海外社会责任制度，助力海外履责管理，践行全球公民责任。

同时，国家电投积极探路 ESG 建设，建立 ESG 工作体系，夯实 ESG 治理基础，2023 年，结合实际研究推出公司 ESG “3+1” 治理结构方案，初步搭建了公司 ESG 治理架构；制定印发公司《ESG 指标总部部门工作指引（A 版）》，进一步明确总部部门 ESG 职责权限；依托公司“建木云”“社会责任管理”等现有数据平台 / 模块，设计开发公司 ESG 管理跟踪系统（1.0 版），初步实现了 ESG 指标（含社会责任指标）数据、报告、案例等内容的录入、审批、检索功能全覆盖，为进一步提升 ESG 管治效能奠定基础。

SPIC has continued to solidify its CSR-based governance system, enhanced the organizational structure for CSR, established a leadership body for CSR, and appointed CSR coordinators in headoffice departments and subsidiaries. It has established cross-departmental mechanisms for CSR management and coordinated advancement to ensure the implementation of CSR initiatives. The Company has formulated the *SPIC Corporate Social CSR Management Regulations* to standardize CSR management practices, alongside annual plans that outline key CSR focuses and monitor their execution. In alignment with operational realities, SPIC has also established a robust overseas CSR system to support responsible management abroad and uphold global citizenship responsibilities.

In the meantime, SPIC has explored ESG development, established an ESG framework and strengthened ESG governance foundations. In 2023, it launched the Company’s ESG “3+1” governance structure, preliminarily establishing the ESG governance architecture. The Company issued the *ESG Indicators Headoffice Department Work Guidelines (Version A)*, further clarifying the responsibilities and authorities of headoffice departments in ESG matters. Leveraging existing data platforms/modules like “Jianmu Cloud” and “CSR Management”, SPIC designed and developed the ESG management tracking system (Version 1.0). This initial implementation covers comprehensive data entry, approval, and retrieval functions for ESG indicators (including social responsibility indicators), laying a foundation for enhancing ESG governance effectiveness in the future.

国家电投社会责任管理原则 SPIC's principles of corporate CSR management		
服务战略原则 Service strategy principle	融合有效原则 Principles of integration and efficiency	和谐共建原则 Harmonious co-building principle
<p>紧紧围绕公司发展战略，实现社会责任与企业战略的有机融合，追求战略发展与责任承担的有机统一。</p> <p>SPIC adheres to its development strategy, achieving organic integration of social responsibility with corporate strategy, and pursuing the organic unity of strategic development and responsibility.</p>	<p>将社会责任理念融入到公司生产经营和职能管理各个环节和不同层级，形成横向协调、纵向承接的工作机制，回应利益相关方关切。</p> <p>SPIC integrates the concept of social responsibility into various aspects and different levels of production, operation, and functional management within the Company, establishing horizontal coordination and vertical integration mechanisms to address stakeholder concerns.</p>	<p>关注利益相关方诉求，推动利益相关方参与，充分发挥各单位、各层级积极性，加强与社会各界沟通，增强运营管理透明度。</p> <p>SPIC focuses on stakeholder demands, promotes their participation, fully harnesses the initiative of each subsidiary and level, enhances communication with various sectors of society, and improves transparency in operational management.</p>

## 责任能力 CSR capability

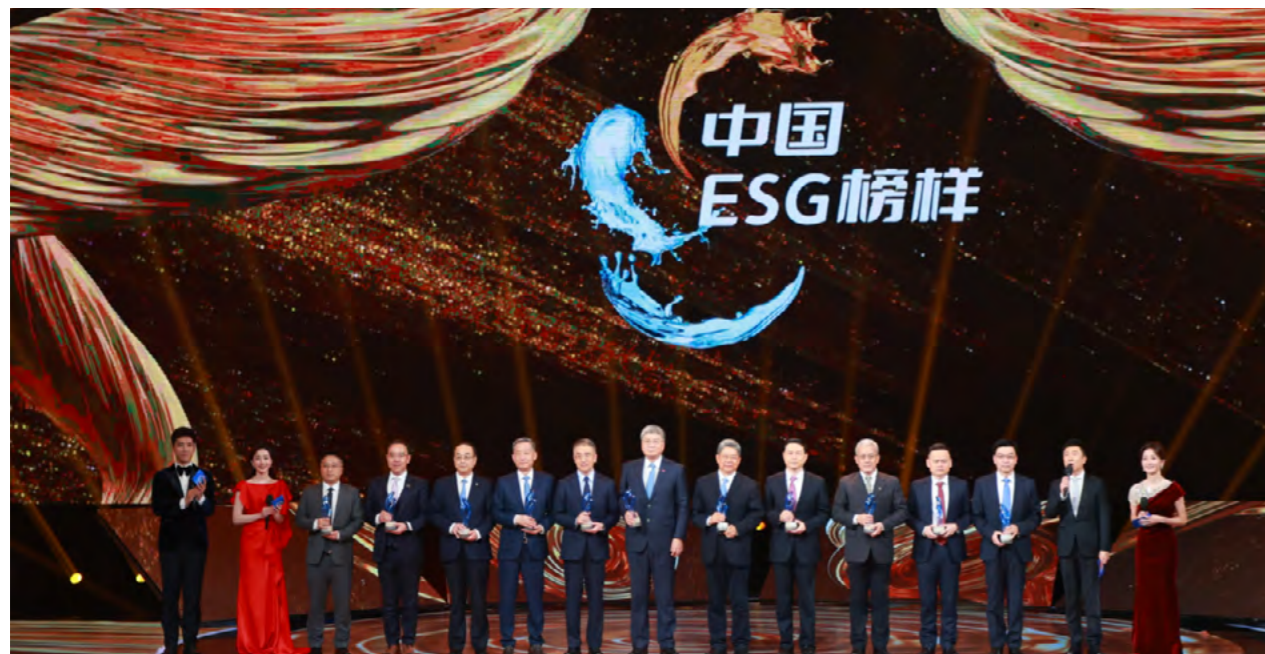
国家电投融合优秀履责表现和前沿履责动态，编制公司年度社会责任 (ESG) “十佳案例”；将社会责任培训纳入公司整体培训计划，分层次、分领域开展社会责任培训，不断提升社会责任管理人员和从业人员的社会责任素养，全面提升公司社会责任能力。2023 年，国家电投担任中央企业 ESG 联盟第一届理事会理事长单位。

SPIC integrates outstanding performance in fulfilling responsibilities and dynamic developments in responsibility frontiers, compiling the Company’s annual top 10 ESG cases. Social responsibility training is incorporated into the Company’s overall training plan, conducting training at different levels and in various areas of social responsibility. This continuous effort enhances the social responsibility literacy of management and staff, comprehensively improving the Company’s CSR capability. In 2023, SPIC served as the chair of the First Council of SOEs ESG Alliance.

## 责任品牌 A responsible brand

国家电投坚持以创建责任品牌为重要抓手，强化社会责任与品牌建设相结合，加快推进公司社会责任品牌体系建设，成立公司品牌管理委员会，借助“中国品牌日”等重要节点，宣传展示公司品牌形象，传递品牌建设好声音。聚焦价值创造，打造“映山红”首个公益品牌，努力成为知责于心、担责于身、履责于行的典范企业，树立“负责任的能源央企”品牌形象。2023年，国家电投位列“2023世界品牌500强”第241位、“2023中国品牌500强”第60位，连续荣获中国品牌节最高奖“华谱奖”。

SPIC insists on creating a responsible brand as a key focus, strengthening the integration of social responsibility with brand development, and accelerating the establishment of the Company's social responsibility brand system. It has established a Brand Management Committee to leverage important events such as the China Brand Day to promote and showcase the Company's brand image and convey positive messages about brand development. Focusing on value creation, SPIC has launched its first public welfare program, "Yingshanhong", striving to become an exemplary enterprise known for its conscientiousness, responsibility, and commitment to action, thereby establishing itself as a responsible SOE in the energy sector. In 2023, SPIC ranked the 241<sup>st</sup> place among the "Top 500 World Brands in 2023", and the 60<sup>th</sup> place among the "Top 500 Chinese Brands in 2023", winning the highest award, the "Huapu Award", at the China Brand Festival for consecutive years.



国家电投荣获中央广播电视总台颁发的十大“中国 ESG 榜样”企业称号  
SPIC was awarded the title of one of the top ten "Chinese ESG Model" enterprises by China Media Group



国家电投荣获人民日报“2023环境、社会及治理(ESG)年度案例”

SPIC received the "2023 Environmental, Social, and Governance (ESG) Annual Case" award from People's Daily



国家电投荣获中央广播电视总台、中国企业改革与发展研究会“2023年度中国 ESG 卓越实践”

SPIC was honored with the "2023 China ESG Excellence Practice" award by China Media Group and the China Enterprise Reform and Development Society



国家电投位列“2023中国企业300强社会责任发展指数”第16名

SPIC ranked the 16<sup>th</sup> in the "2023 China Top 300 Enterprises Social Responsibility Development Index"



国家电投荣获2023年责任先锋奖“海外履责奖”

SPIC received the 2023 Responsibility Pioneer Award for Overseas Responsibility



国家电投承办“中央企业 ESG 沙龙暨中国企业高端对话”  
SPIC hosted the SOEs ESG Salon and China Enterprises High-end Dialogue



“码”上浏览国家电投 14 个 ESG 优秀实践案例

Scan the QR code to view SPIC's 14 excellent ESG practice cases



## 国家电投 2023 年度社会责任(ESG)“十佳案例”



2023 年, 国家电投持续开展年度社会责任(ESG)“十佳案例”评选, 以评价促发展、以选拔促激励, 营造积极履行社会责任、认真践行 ESG 理念的浓厚氛围, 展示国家电投“负责任的能源央企”良好形象。

序号	案例名称	所属单位
1	太平洋水电智利公司: 十四年潜心研究只为保护环境及生物多样性	中国电力
2	“积”聚温暖力量 “投”身抗震救灾	黄河公司 青海省投
3	推动绿色转型升级 打造“煤—新能源—电—铝”循环经济新范式	内蒙古公司
4	扎根地中海 向“新”求“质”推动高质量发展	上海电力
5	大安风光制氢引领绿色氢基能源产业发展	吉电股份
6	探索核能奥秘 体验创新之旅	上海核工院
7	绿能澎湃: 为兰考县域能源革命“赋能加速”	中国电能
8	守护绿色西江: 解锁“一江碧水向东流”的生态密码	广西公司
9	“帮在实处 扶在关键” 美姑乡村振兴 踏出“甜蜜致富路”	四川公司
10	首创全国红枣产业“碳标签” 引领“碳标签”特色农产品新风尚	智慧能投



## SPIC's 2023 Annual Social Responsibility (ESG) "Top 10 Cases"



In 2023, SPIC continued its annual selection of the "Top 10 Cases" for social responsibility (ESG) fulfillment, with an aim to encourage and inspire more best practices in this regard. This fostered a strong atmosphere of fulfilling social responsibilities and practicing ESG principles, demonstrating SPIC's positive image as a responsible energy SOE.

Serial number	Case name	Subsidiary
1	Pacific Hydro Chile – 14 years of dedicated research to protect the environment and biodiversity	SPIC China Power International Development
2	Pooling efforts to earthquake relief	SPIC Huanghe Hydropower Development Qinghai Provincial Investment
3	Foster the new circular economy model of “coal – new energy – electricity – aluminum” to boost green transition and upgrading	SPIC Inner Mongolia Electric Power
4	Take strong presence in the Mediterranean region, and advance the high-quality development with new quality productive forces	Shanghai Electric Power Co., Ltd.
5	Da'an project of hydrogen production with wind and PV power, leading development of the green hydrogen-based energy industry	SPIC Jilin Electric Power
6	Explore nuclear energy mysteries, and engage in scientific and technological innovation	Shanghai Nuclear Engineering Research and Design Institute
7	Green energy surge: empower and accelerate the energy revolution in Lankao County	SPIC China Power Complete Equipment
8	Safeguard the green Xijiang River: launch ecological conservation initiatives to ensure clear waters	SPIC Guangxi Electric Power
9	Solid efforts to revitalize Meigu County by boosting its honey industry	SPIC Sichuan Electric Power
10	Initiate the “Carbon Label” certification in the national red date industry and set a new trend of “Carbon Label” distinctive agricultural products	SPIC Smart Energy Investment



“码”上阅读电子版国家电投 2023 年度社会责任(ESG)“十佳案例”  
Scan the QR code to read the digital edition of SPIC's 2023 Annual Social Responsibility (ESG) "Top 10 Cases"

## 利益相关方沟通

## Communication with Stakeholders

国家电投始终与利益相关方保持紧密沟通，不断拓展多元沟通渠道，健全信息公开管理制度体系。公司官网设置“社会责任”专栏，定期更新公司履行社会责任相关报告，通过官方微信平台以及媒体网站等及时公开披露企业社会责任相关工作信息或活动资讯，积极组织 and 参与行业论坛及会议，举办品牌活动、沙龙日和开放日等，增进利益相关方参与，为利益相关方和社会公众提供广泛了解公司履责的渠道和途径。

SPIC consistently maintains close communication with stakeholders, continuously expands diverse communication channels, and improves the information disclosure management system. SPIC's official website has a dedicated "Social Responsibility" section, which is regularly updated with reports related to the Company's fulfillment of social responsibilities. Through the official WeChat platform and media websites, SPIC timely discloses information on corporate social responsibility-related work or activity news. SPIC actively organizes and participates in industry forums and conferences, hosts brand events, salon days, and open days to enhance stakeholder participation, providing stakeholders and the general public with extensive channels and means to understand its responsibility performance.



## 未来展望 Looking Forward

跋山涉水，不改一往无前；  
山高路远，定见风光无限。

We will not be daunted by the challenges ahead, and we're determined to see rainbow at the end of this journey.

2024 年是中华人民共和国成立 75 周年，是实施“十四五”规划的关键一年。我们将坚持以习近平新时代中国特色社会主义思想为指导，全面贯彻落实党的二十大精神，完整、准确、全面贯彻新发展理念，服务构建新发展格局，统筹高质量发展和高水平安全，坚持聚焦主责主业，保持“风雨不动安如山”的战略定力，扎实推动“十四五”规划落地实施，求真务实、稳中求进，存量提质、增量做优、蓄势未来，不断提高核心竞争力、增强核心功能，努力发挥好科技创新、产业控制、安全支撑作用，在推进中国式现代化建设中展现国家电投新作为！

In 2024 marks the 75<sup>th</sup> anniversary of the founding of the People's Republic of China and a critical year for implementing the "14<sup>th</sup> Five-Year Plan". We will adhere to the Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era as our guide, fully implement the guidelines of the 20<sup>th</sup> National Congress of the CPC, comprehensively implement the new development philosophy accurately and completely, serve the establishment of a new development pattern, coordinate high-quality development and high-level security, focus on core responsibilities and main businesses, maintain strategic determination with steadfastness in the face of challenges, solidly promote the implementation of the "14<sup>th</sup> Five-Year Plan", seek truth, pragmatism, stability, and progress, improve existing resources, optimize growth, and accumulate strength for the future. We will continuously enhance core competitiveness and strengthen core functions, strive to play a good role in scientific and technological innovation, industrial control, and safety support, and demonstrate SPIC's new achievements in promoting Chinese modernization drive.

## 附录 Appendix

### 关键绩效 Key Performance

指标	单位	2021	2022	2023
营业收入	亿元	3320.69	3633.91	3857.1
利润总额	亿元	108.07	274.3	406.56
净资产收益率	%	1.18	4.45	6.45
资产负债率	%	73.84	69.91	68.61
纳税总额	亿元	271.88	316.03	360.93
全员劳动生产率	万元/人	96.2	116.3	135.34
科技创新获奖数量	个	140	110	165
新增专利数	项	3222	1241	4146
研发投入	亿元	86.7	134.87	157.28
经济合同履约率	%	100	100	100
报告期内审查的供应商数量	个	122345	150684	52772 <sup>①</sup>
全年能源消耗总量	万吨标煤	6472.54	6486.98	6125.08
企业单位产值综合能耗	吨标煤/万元	2.22	2.01	1.63
环保培训次数	人次	27180	27908	28037
供电煤耗(含供热)	克/千瓦时	297.07	295.9	293.34
单位发电油耗	吨/亿千瓦时	10.95	8.76	8.09
发电水耗率	千克/千瓦时	1.649	1.532	1.513
废水排放量	万吨	1435.65	1382.97	1804.32 <sup>②</sup>
火电机组脱硫装备率	%	100	100	100
火电机组脱硝装备率	%	100	100	100
二氧化硫排放率	克/千瓦时	0.128	0.11	0.106
氮氧化物排放率	克/千瓦时	0.167	0.151	0.15
烟尘排放率	克/千瓦时	0.0014	0.0013	0.0011
安全培训次数	次	10455	10676	11295
安全培训员工人数	人次	345011	356521	377148
安全生产投入	亿元	45.71	57.32	69.34
安全生产事故数 <sup>③</sup>	次	0	1	0
员工死亡人数 <sup>④</sup>	人	0	1	0
员工工伤人数 <sup>⑤</sup>	人	1	0	0

① 2022 年底，国家电投上线供应商管理系统，对历史不活跃供应商进行了清理，2023 年，该指标统计口径为活跃供应商数量。

② 由于市场原因，粉煤灰销量低于预期，导致废水排放量增加。

③ ④ ⑤ 该指标统计口径为国家电投在册正式员工事故起数和伤亡人数。

Indicator	Unit	2021	2022	2023
Operating revenue	RMB 100 million	3,320.69	3,633.91	3,857.1
Total profit	RMB 100 million	108.07	274.3	406.56
Return on equity	%	1.18	4.45	6.45
Asset-liability ratio	%	73.84	69.91	68.61
Total tax paid	RMB 100 million	271.88	316.03	360.93
Labor productivity of all employees	RMB 10,000/person	96.2	116.3	135.34
Number of scientific and technological innovation awards	/	140	110	165
Number of new patents	/	3,222	1,241	4,146
R&D investment	RMB 100 million	86.7	134.87	157.28
Performance rate of business contracts	%	100	100	100
Number of suppliers reviewed during the reporting period	/	122,345	150,684	52,772 <sup>①</sup>
Total energy consumption	10,000 tons of standard coal	6,472.54	6,486.98	6,125.08
Comprehensive energy consumption per unit of output value	Ton of standard coal/RMB 10,000	2.22	2.01	1.63
Number of environmental protection training sessions	/	27,180	27,908	28,037
Coal consumption for power supply (including heating)	g/kWh	297.07	295.9	293.34
Oil consumption per unit of power generation	Ton/100 GWh	10.95	8.76	8.09
Water consumption rate for power generation	kg/kWh	1.649	1.532	1.513
Wastewater discharge	10,000 tons	1,435.65	1,382.97	1,804.32 <sup>②</sup>
Desulfurization rate of thermal power units	%	100	100	100
Denitration rate of thermal power units	%	100	100	100
Sulfur dioxide emission rate	g/kWh	0.128	0.11	0.106
Nitrogen oxide emission ratio	g/kWh	0.167	0.151	0.15
Soot emission ratio	g/kWh	0.0014	0.0013	0.0011
Number of safety training sessions	/	10,455	10,676	11,295
Number of employees receiving safety training	/	345,011	356,521	377,148
Work safety investment	RMB 100 million	45.71	57.32	69.34
Number of work safety accidents <sup>③</sup>	/	0	1	0
Number of work-related deaths <sup>④</sup>	Person	0	1	0
Number of work injuries <sup>⑤</sup>	Person	1	0	0

① At the end of 2022, SPIC's online supply management system removed inactive suppliers. In 2023, this indicator only covered active suppliers.

② Due to the declining market, coal ash sales have fallen below expectations, leading to an increase in wastewater discharge.

③ ④ ⑤ Coverage of this indicator: accidents and deaths of regular employees in SPIC's payroll.

指标	单位	2021	2022	2023
重大设备事故数	次	0	0	0
一般设备事故数	次	0	0	0
机组等效可用系数	%	92.9	92.62	93.3
新建项目执行环境影响评价的比例	%	100	100	100
研发人员数量	人	6047	6687	8603
科技人才数量	人	9792	10508	12372
员工总人数	人	119837	126500	127514
女性员工数量	人	24552	24477	25004
少数民族员工数量	人	13521	13044	13526
残疾人雇佣数量	人	789	797	797
报告期内吸纳就业人数	人	6611	7359	8701
劳动合同签订率	%	100	100	100
女性管理者比例	%	12	12.7	12.9
每年人均带薪年假天数	天	11	11	9.9
员工年度体检覆盖率	%	100	100	100
员工职业健康档案覆盖率	%	100	100	100
员工培训总投入	万元	29950	28258	30745
员工培训参与人次	人次	733477	717511	778942
员工人均培训时长	小时	87	83	92.02
员工流失率	%	2.2	2.2	2.04
参加工会员工占比	%	100	100	100
困难员工帮扶总投入	万元	631.81	709.08	1072.97
帮扶困难员工人数	人	2124	1446	2369
员工志愿者活动时长	小时	26832	34882	36112
员工志愿者活动参与人数	人次	15333	19933	24478
公益捐赠总额	万元	2349.64	4429.13	6291.57
液态流出物(除氚碳外其他核素)占国家年限值 <sup>⑥</sup>	%	1.76	1.16	1.18
气态流出物(惰性气体)占国家年限值	%	5.52	2.46	2.36
放射性固体废物产生量	立方米	71.85	54.57	84.63 <sup>⑦</sup>
二级及以上的核事件次数(仅核电)	次	0	0	0
在运机组非计划停堆次数(仅核电)	次	1	2	1
LOE(执照运行事件)事件次数(仅核电)	次	1	2	2
超剂量照射事件次数(仅核电)	次	0	0	0

⑥ 该指标历年排放量均远低于国家规定限值。

⑦ 2023 年, 海阳核电有 2 台机组大修, 因此该指标高于无机组大修的 2022 年。

Indicator	Unit	2021	2022	2023
Number of major equipment accidents	/	0	0	0
Number of general equipment accidents	/	0	0	0
Unit equivalent availability coefficient	%	92.9	92.62	93.3
Proportion of new projects that have received environmental impact assessment	%	100	100	100
Number of R&D personnel	Person	6,047	6,687	8,603
Number of scientific and technological talents	Person	9,792	10,508	12,372
Total number of employees	Person	119,837	126,500	127,514
Number of female employees	Person	24,552	24,477	25,004
Number of employees from ethnic minorities	Person	13,521	13,044	13,526
Number of disabled employees	Person	789	797	797
Number of new employees during the reporting period	Person	6,611	7,359	8,701
Labor contracts coverage	%	100	100	100
Proportion of female managers	%	12	12.7	12.9
Number of paid leave days per employee per year	/	11	11	9.9
Annual physical examination coverage	%	100	100	100
Occupational health record coverage	%	100	100	100
Total investment in employee training	RMB 10,000	29,950	28,258	30,745
Number of employees participating in training sessions	/	733,477	717,511	778,942
Average length of training session per employee	Hour	87	83	92.02
Employee turnover rate	%	2.2	2.2	2.04
Proportion of employees who join the trade union	%	100	100	100
Total investment in assisting employees in need	RMB 10,000	631.81	709.08	1,072.97
Number of employees in need receiving assistance	Person	2,124	1,446	2,369
Hours of volunteer services	Hour	26,832	34,882	36,112
Number of employee engaging in volunteer services	/	15,333	19,933	24,478
Total donation to social welfare causes	RMB 10,000	2,349.64	4,429.13	6,291.57
Proportion of liquid effluent (nuclides except tritium carbon) in the national annual limits <sup>⑥</sup>	%	1.76	1.16	1.18
Proportion of gaseous effluent (inert gases) in the national annual limits	%	5.52	2.46	2.36
Amount of radioactive solid waste generated	m <sup>3</sup>	71.85	54.57	84.63 <sup>⑦</sup>
Number of nuclear events at Level 2 and above (nuclear power only)	/	0	0	0
Number of unplanned shutdowns of operating units (nuclear power only)	/	1	2	1
Number of LOE (license operation events) (nuclear power only)	/	1	2	2
Number of overdose events (nuclear power only)	/	0	0	0

⑥ The historical emissions of this indicator are far lower than state-specified limits.

⑦ In 2023, two units of Haiyang Nuclear Power Plant received overhaul. So the indicator value was higher than that in 2022 when no units were overhauled.

## 指标索引

章节	CASS-CSR 4.0	页码	
报告导读	P1.1,P1.2,P1.3	-	
董事长致辞	P2.1,P2.2	-	
关于我们	P4.1,P4.2,P4.3,P4.4,P4.5, G1.1	01-12	
产品卓越 以能源低碳化绘就多彩河山	打造清洁能源	E1.7,E1.9,E1.11,E2.3, E2.6	15-22
	绿色低碳运营	E1.1,E1.3,E1.5,E2.3,E2.8,E2.11,E2.13,E2.15, E2.23	23-26
	关注气候变化	E1.7,E1.9,E2.1,E2.17,E2.24,E3.1,E3.2	27-30
品牌卓著 以负责任经营诠释为民初心	心系员工福祉	S2.2,S2.3,S2.4,S2.7,S2.8,S2.10,S2.11,S2.12, S2.13,S2.14,S2.15,S2.16,S2.17,S2.18,S3.1, S3.2,S3.3	33-44
	助力和谐社区	S4.1,S4.5,S4.6,S4.7,S4.8,S4.9,S4.10,S4.11, S4.12,S4.13	45-49
	争做全球公民	M3.4,M3.6,S1.5,S4.1,S4.2,E1.9	50-58
创新领先 以新质生产力开拓能源革命	勇攀创新高地	M2.4,M2.5,M2.7,M3.6	61-64
	深耕新兴产业	M2.4,M2.7,M3.4,M3.6,E1.3,E1.9,E2.3,E2.6	64-75
	共赴崭新未来	M2.1,M2.4,M3.6,M3.10	76-80
治理现代 以高质量发展勇创世界一流	完善公司治理	M1.1,M1.3	83-86
	严格依法合规	S1.1	87
	深化企业改革	S1.4	88-90
责任专题	P3.1,P3.2	91-92	
责任管理	G2.3,G2.4,G3.2,G3.3,G4.1,G5.1,G6.1,G6.2, M1.4	93-100	
未来展望	A1	101-102	
附录	关键绩效	A2	103-106
	指标索引	A5	107-108
	评级报告	A4	109-110
	意见反馈	A6	111-112

## Index of Indicators

Chapter	CASS-CSR 4.0	Page	
Introduction	P1.1,P1.2,P1.3	-	
Message from the Chairman	P2.1,P2.2	-	
About Us	P4.1,P4.2,P4.3,P4.4,P4.5, G1.1	01-12	
Excellent Products Low-carbon Energy for Green Environment	Clean Energy	E1.7,E1.9,E1.11,E2.3, E2.6	15-22
	Green and Low-carbon Operation	E1.1,E1.3,E1.5,E2.3,E2.8,E2.11,E2.13,E2.15, E2.23	23-26
	Concern for Climate Change	E1.7,E1.9,E2.1,E2.17,E2.24,E3.1,E3.2	27-30
Remarkable Brand Responsible Operation for People-centered Aspiration	Commitment to Employee Wellbeing	S2.2,S2.3,S2.4,S2.7,S2.8,S2.10,S2.11,S2.12, S2.13,S2.14,S2.15,S2.16,S2.17,S2.18,S3.1, S3.2,S3.3	33-44
	Contribution to Community Harmony	S4.1,S4.5,S4.6,S4.7,S4.8,S4.9,S4.10,S4.11, S4.12,S4.13	45-49
	Growing into a Global Citizen	M3.4,M3.6,S1.5,S4.1,S4.2,E1.9	50-58
Leading Innovation New Quality Productive Forces for Energy Revolution	Striving for New Innovation High	M2.4,M2.5,M2.7,M3.6	61-64
	Engagement in Emerging Industries	M2.4,M2.7,M3.4,M3.6,E1.3,E1.9,E2.3,E2.6	64-75
	Cooperation for Bright Future	M2.1,M2.4,M3.6,M3.10	76-80
Modern Governance High-quality Development for a World-class Business	Better Corporate Governance	M1.1,M1.3	83-86
	Stricter Compliance with Laws	S1.1	87
	Extensive SOE Reform	S1.4	88-90
Cases of Responsibility	P3.1,P3.2	91-92	
CSR Management	G2.3,G2.4,G3.2,G3.3,G4.1,G5.1,G6.1,G6.2, M1.4	93-100	
Looking Forward	A1	101-102	
Appendix	Key Performance	A2	103-106
	Index of Indicators	A5	107-108
	Rating Report	A4	109-110
	Feedback	A6	111-112

## 评级报告

### 《国家电力投资集团有限公司 2023 社会责任报告》评级报告

受国家电力投资集团有限公司委托，“中国企业社会责任报告评级专家委员会”抽选专家组成评级小组，对《国家电力投资集团有限公司 2023 社会责任报告》（以下简称《报告》）进行评级。

#### 一、评级依据

中国社会科学院《中国企业社会责任报告指南 (CASS-CSR 4.0)》暨“中国企业社会责任报告评级专家委员会”《中国企业社会责任报告评级标准 (2020)》。

#### 二、评级过程

1. 评级小组审核确认《报告》编写组提交的《企业社会责任报告过程性资料确认书》及相关证明材料；
2. 评级小组对《报告》编写过程及内容进行评价，拟定评级报告；
3. 评级专家委员会副主席、评级小组组长、评级小组专家共同签署评级报告。

#### 三、评级结论

##### 过程性 (★★★★★)

国家电投成立社会责任报告编制领导小组，董事长、党组书记担任组长，把控整体方向及关键节点，并负责报告终审，党组宣传部（公共关系部、文化品牌部）牵头组建报告编制工作组，统筹具体编制工作；将报告定位为提升社会责任管理水平、强化利益相关方沟通、提升责任品牌形象、增强企业可持续发展竞争力的重要工具，功能价值定位明确；根据国家宏观政策、行业对标分析、公司重大事项、利益相关方关切等识别实质性议题；积极推动下属企业编发社会责任报告，并举办全系统社会责任专题培训会，全面提升社会责任能力；计划召开专项发布会，并将以电子版、印刷品的形式呈现报告，过程性表现卓越。

##### 实质性 (★★★★★)

《报告》系统披露了贯彻宏观政策、保障电力供应、发展绿色电力、安全生产、节约资源能源、减少“三废”排放、厂区及周边环境治理等所在行业关键性议题，叙述详细充分，具有卓越的实质性表现。

##### 完整性 (★★★★★)

《报告》主体内容从“产品卓越 以能源低碳化绘就多彩河山”“品牌卓著 以负责任经营诠释为民初心”“创新领先 以新质生产力开拓能源革命”“治理现代 以高质量发展勇创世界一流”等角度披露了所在行业核心指标的 90.44%，完整性表现卓越。

##### 平衡性 (★★★★★)

《报告》披露了“安全生产事故数”“员工死亡人数”“员工工伤人数”“重大设备事故数”“员工流失率”“生态环保严重违法违规及突发环境事件”等负面数据信息，并对部分指标的负面变化进行简要说明，平衡性表现卓越。

##### 可比性 (★★★★★)

《报告》披露了“营业收入”“纳税总额”“全年能源消耗总量”“供电煤耗(含供热)”“火电机组脱硫装备率”“残疾人雇佣数量”“女性管理者比例”“公益捐赠总额”等 62 个关键指标连续 3 年的对比数据，并对“位列 2023 世界品牌 500 强第 241 位、2023 中国品牌 500 强第 60 位”等情况进行横向比较，可比性表现卓越。

##### 可读性 (★★★★★)

《报告》采用议题型框架结构，系统阐述了企业在环境保护、员工关爱、公益慈善、海外责任、创新发展、依法合规、企业改革等方面的履责行动与成效；封面及章节跨页设计采用具有企业特色的实景图，美观大方，凸显行业特点及企业辨识度；多处嵌入二维码拓展链接，提升报告的交互性及趣味性，可读性表现卓越。

##### 创新性 (★★★★★)

《报告》分别从 E、S 和 G 角度设置“守青护绿，呵护原生态人与自然共和谐”“鼎力保供，能源‘国家队’倾力攻坚勇担当”“追求卓越，董事会建设‘探路过河’创范本”责任专题，聚焦生态保护、能源保供、董事会建设的重点与亮点，彰显企业的履责担当；首次以中英文混排展示企业履责信息，有效增益国际履责传播；积极响应 SDGs，回应联合国可持续发展目标；推动下属企业编发社会责任报告，构建多层次的报告体系，创新性表现卓越。

##### 综合评级 (★★★★★+)

经评级小组评价，《国家电力投资集团有限公司 2023 社会责任报告》的过程性、实质性、完整性、平衡性、可比性、可读性、创新性均达到五星级，综合为“五星级”级，是企业社会责任报告中的典范。

#### 四、改进建议

1. 增加对企业履责不足之处分析的披露，进一步提高报告的平衡性；
2. 强化利益相关方参与的深度与广度，进一步提高报告的过程性管理。



国家电投社会责任报告三年获得五星级评价、首次获得五星佳级评价

张洪思 评级小组组长  
黄群慧 评级专家委员会副主席  
钟宏武 评级小组专家



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出具时间：2024 年 7 月 1 日

## Rating Report

### Rating Report for the 2023 Social Responsibility Report of State Power Investment Corporation Limited

Commissioned by State Power Investment Corporation Limited (SPIC), the Chinese Expert Committee on CSR Report Rating selected experts to form a rating group to evaluate the 2023 Social Responsibility Report of State Power Investment Corporation Limited (hereinafter referred to as "the Report").

#### I. Rating Basis

The rating is based on the Guidelines on Corporate Social Responsibility Reporting for Chinese Enterprises (CASS-CSR 4.0) by the Chinese Academy of Social Sciences and the Chinese Corporate Social Responsibility Report Rating Standards (2020) by the Chinese Expert Committee on CSR Report Rating.

#### II. Rating Process

1. The rating group reviewed and confirmed the Corporate Social Responsibility Report Procedural Information Confirmation Letter and relevant supporting materials submitted by the drafting team of the Report.
2. The rating group evaluated the drafting process and content of the Report, and drafted the rating report.
3. The Vice Chairman of the rating expert committee, as well as the head and experts of the rating group jointly signed and reviewed the rating report.

#### III. Rating Conclusion

##### Procedural (★★★★★)

SPIC established a leadership team for drafting the social responsibility report, led by SPIC's Chairman, who oversees the overall direction and key milestones and is responsible for the final review of the report. The Publicity Department (Public Relations Department and Cultural Brand Department) took the lead in forming the report drafting team to coordinate the specific drafting tasks. The report is positioned as a crucial tool to improve social responsibility management, strengthen stakeholder communication, enhance the responsible brand image, and increase SPIC's sustainable development competitiveness, with a clear functional value positioning. Material topics were identified based on national macro policies, industry benchmarking analysis, SPIC's significant events, and stakeholder concerns. It promoted the drafting and publication of social responsibility reports by its subsidiaries and held specialized training sessions on social responsibility across the entire system, significantly enhancing social responsibility capabilities. A special release conference is planned, and the Report will be presented in both electronic and printed formats, demonstrating excellent procedural performance.

##### Materiality (★★★★★)

The Report systematically discloses material industry topics such as implementing macro policies, ensuring power supply, developing green energy, maintaining production safety, conserving resources and energy, reducing emissions of the "three wastes" (waste gas, waste water, and solid waste), and managing the environment both within and around plant areas. The detailed and comprehensive narratives demonstrate excellent materiality performance.

##### Completeness (★★★★★)

The main content of the Report covers 90.44% of core industry indicators from perspectives such as "Excellent Products: Low-carbon Energy for Green Environment", "Remarkable Brand: Responsible Operation for Original People-centered Aspiration", "Leading Innovation: New Quality Productive Forces for Energy Revolution", and "Modern Governance: High-quality Development for a World-class Business", demonstrating excellent completeness performance.

##### Balance (★★★★★)

The Report discloses negative data and information, such as the number of production safety accidents, employee deaths, employee injuries, major equipment accidents, employee turnover, as well as significant environmental protection violations and emergencies, and briefly describes the negative changes of some indicators, demonstrating excellent balanced performance.

##### Comparability (★★★★★)

The Report discloses three years of comparative data for 62 key indicators, including operating revenue, total tax paid, total annual energy consumption, coal consumption for power supply (including heating), desulfurization equipment rate of thermal power units, the number of disabled employees, the proportion of female managers, and the total amount of charitable donations, and provides horizontal comparisons, such as ranking 241<sup>st</sup> in the 2023 World's Top 500 Brands and 60<sup>th</sup> in the 2023 China's Top 500 Brands, demonstrating excellent comparability performance.

##### Readability (★★★★★)

The Report applies a thematic framework to systematically elaborate on SPIC's responsibility-fulfilling actions and achievements in environmental protection, employee care, public welfare, overseas responsibility, innovative development, legal compliance, and corporate reform. The cover and chapter spreads feature large, real-life images characteristic of SPIC, making it aesthetically pleasing and highlighting industry characteristics and corporate recognition. Also, the inclusion of multiple "scan to view" links enhances interactivity and engagement. These all demonstrate excellent readability performance.

##### Innovativeness (★★★★★)

The Report sets up responsibility themes from E (Environmental), S (Social), and G (Governance) perspectives: "protecting greenery and harmony between humankind and nature", "ensuring supply, the 'national energy team' bravely takes on challenges with determination", and "pursuing excellence: the board of directors builds a pathfinding model". These themes focus on key areas and highlights in ecological protection, energy supply, and board governance, and demonstrate the SPIC's commitment to its responsibilities. The Report presents corporate responsibility information in a mixed Chinese-English format for the first time, which helps enhance international communication of fulfilling corporate responsibility. The Report responds to the SDGs, aligning with the United Nations' Sustainable Development Goals, and promotes the drafting and publication of social responsibility reports by SPIC's subsidiaries, creating a multi-level reporting system. These all demonstrate excellent innovativeness performance.

##### Overall Rating (★★★★★+)

According to the evaluation by the rating group, the Report achieved a five-star rating in procedural, completeness, materiality, balance, comparability, readability, and innovativeness, earning an overall rating of "five-star plus". It stands as a model in corporate social responsibility reporting.

#### IV. Recommendations on Improvement

1. It is recommended to increase the disclosure of analysis on areas where SPIC has fallen short in fulfilling its responsibilities, to further enhance the balance of the Report.
2. It is recommended to strengthen the depth and breadth of stakeholder engagement, to further improve the process management of the Report.



SPIC's Social Responsibility Report has received a five-star rating for three consecutive years and a five-star plus rating for the first time.

张洪思 评级小组组长  
黄群慧 评级专家委员会副主席  
钟宏武 评级小组专家



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Head of the Rating Group

Vice Chairman of the Chinese Expert Committee on CSR Report Rating

Expert of the Rating Group

Released on: July 1, 2024

## 意见反馈

### 尊敬的读者：

您好！为不断提高社会责任履行能力和管理水平，持续改进社会责任管理工作及社会责任报告编制工作，我们诚挚希望您能够针对本报告提出相关意见和建议。

请将您的意见填写到下方，并邮寄到

地址：北京市西城区北三环中路 29 号院 1 号楼国家电力投资集团有限公司党组宣传部（公共关系部、文化品牌部）

电话：8610-66298000

邮编：100029

### 选择性问题

1. 您对本报告的总体评价如何？

非常好       较好       一般       较差

2. 您认为本报告是否能全面、准确地反映国家电投对经济、社会、环境的重大影响？

能       一般       不能

3. 您认为本报告是否能对利益相关方所关心的问题进行了回应和披露？

能       一般       不能

4. 您认为本报告所披露的信息、指标、数据是否清晰、准确、完整？

是       一般       否

### 开放性问题

1. 您最满意本报告哪一方面？

.....

2. 您希望进一步了解哪些信息？

.....

3. 您对我们今后编制、发布社会责任报告有何建议？

.....

## Feedback

### Dear readers:

Hello! To enhance our capability and management level in fulfilling social responsibilities, and to improve our CSR management and reporting, we sincerely hope that you can provide relevant comments and suggestions regarding this report.

Please fill in your comments below and send them to:

Address: Publicity Department (Public Relations Department, and Cultural Brand Department) of State Power Investment Corporation, Building 1, Compound 29, North 3<sup>rd</sup> Ring Road, Xicheng District, Beijing;

Tel: +86 10 6629 8000

Post code: 100029

### Multiple-choice Questions

1. How do you overall evaluate this report?

Excellent       Good       Fair       Poor

2. Do you think this report comprehensively and accurately reflects SPIC's significant impacts on the economy, society, and environment?

Yes       Average       No

3. Do you believe this report effectively addresses and discloses issues of concern to stakeholders?

Yes       Average       No

4. Are the information, indicators, and data disclosed in this report clear, accurate, and complete?

Yes       Average       No

### Open-ended Questions

1. What aspect of this report are you most satisfied with?

.....

2. What information would you like to know more about?

.....

3. Do you have any suggestions for our future preparation and publication of ESG reports?

.....

建设具有全球竞争力的世界一流清洁能源企业  
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