SDG Solutions
面向SDG的中国行动

COP30 BRASIL AMAZÔNIA BELÉM 2025

2025 Climate Solutions from Chinese Enterprises
应对气候变化的中国企业解决方案（2025）

国家电网
STATE GRID
国网固原供电公司
STATE GRID GUYUAN POWER SUPPLY COMPANY

A Green Blueprint for Jingning
Safeguarding the Ecology of Jingning

绿能小院——解锁乡村家庭用能新模式

Courtyard with Green Energy Unlocking a New Model of Energy Consumption for Rural Households

Challenges

Guyuan City, Ningxia province is located in the Liupan Mountain area, where rural economy is relatively backward. Most rural households rely on firewood, coal, and traditional thermal power generation for heating and cooking. Promoting the transition of rural household energy consumption faces three main challenges. First is the low utilization efficiency of wind and soar resources. The abundant wind and solar resources in Guiyuan are restricted by geographical conditions, industrial development, and the seasonal and scattered rural energy load. Second is the weak investment willingness. The insufficient publicity and guidance have resulted in farmers' lack of understanding of the value of energy transition and smart microgrid development. Third is the lack of supporting policies. Although rural vitalization has raised farmers' living standards and given them the financial ability to invest in energy storage, government policy support is still inadequate.

Building an all-electric zero-carbon green energy courtyard – Revolutionary Liupan Mountain Green Energy Courtyard

Solution

Building green energy courtyards to demonstrate clean energy consumption scenarios

Based on the "wind-solar-storage-load" integration, State Grid Guyuan Power Supply Company ("State Grid Guyuan" for short), in collaboration with new energy enterprises, invested in building a green energy courtyard in Yangjiadian Village, Longde County. The household energy microgrid installed in the courtyard integrates wind power, solar power, energy storage, charging, and intelligent control. It is equipped with two sets of 4kW small wind turbines and 16kW PV panels. After the electrical energy is converted into 220V alternating current by an inverter, it can be stored in a 30kW energy storage device.

Currently, the daily wind and solar power generation of the courtyard can reach 140 kWh, meeting the electricity needs of the popular science hall and 3 homestays in the courtyard, realizing self-sufficiency and stable operation. Surplus electricity can be sold on the grid, generating an annual sales income of over US$2,100. This not only broadens the income-increasing channels for villagers but also provides a scenario for promoting new energy policies and applications.

Leveraging the demonstration effect of green energy courtyards to build clean energy cooperation pilots

State Grid Guyuan selected Yangjiadian Village, Longde County as the project pilot. Based on the demand and basic conditions for microgrid development, the project has tailored a promotion plan for the integrated wind-solar-storage-charging microgrid construction and promoted the "progressive implementation".

Addressing energy transition issues and gaining income from surplus electricity sales

Liupan Mountain area is an old revolutionary base, a revolutionary education base, and a key battlefield for consolidating China's poverty alleviation achievements. Industries such as characteristic agriculture, cultural tourism, and e-commerce are developing rapidly, which requires reliable electricity to support the upgrading of people-benefiting industries. Cooperating with government departments, State Grid Guyuan has promoted the electrification of characteristic industries, tourists accommodation, and catering, and regularly provides energy efficiency services in pilot villages. Communicating with village committees and representatives, the company launched distributed solar power pilots on collectively owned land and rural farmhouses, realizing self-consumption of generated electricity and grid-connected sales of surplus. The considerable benefits from the microgrid pilots for village collective and villagers have effectively enhanced villagers' investment willingness and confidence.

Immersive communication to boost villagers' cooperation willingness

State Grid Guyuan popularized knowledge and applications of clean energy such as wind and solar energy among villagers through various voluntary service activities, including energy knowledge lectures, power knowledge workshops, etc. It also organized villagers to visit the completed integrated wind-solar-storage-charging microgrid projects, allowing them to personally experience the convenience and benefits brought by green energy, thereby increasing their willingness to cooperate.

Green power publicity at the Revolutionary Liupan Mountain Green Energy Courtyard

Multiple Benefits

Economic

The practice of the new-type power system (source-grid-storage-load + intelligence) in rural courtyards has met the growing energy demand in the process of rural vitalization. By the end of 2024, State Grid Guyuan had built 25 sets of small wind-solar power generation facilities and 27 groups of energy storage equipment in three pilot villages. The microgrid has fully exerted its regulatory capacity during unstable energy supply, realizing 24/7 stable and reliable power supply. This has helped the three pilot villages achieve significant growth in gross regional product, rural e-commerce sales, rural tourism visitor volume, and eco-tourism income, contributing to the modernization of local agricultural production, the development of rural e-commerce, and the prosperity of rural tourism.

Immersive communication enhances villagers' cooperation willingness

Environmental

The project has organized 25 visiting activities for villagers, allowing more than 320 local villagers to experience the convenience of green energy. While improving villagers' quality of life and sense of happiness, it has successfully increased villagers' support rate for green development from 30% to 80%. Currently, the project has reached cooperation intentions on the construction of integrated wind-solar-storage microgrids with more than 10 households in the Liupan Mountain area. It has also attracted the study tour from more than 10 surrounding villages and accelerated the popularization and application of green power in rural scenarios.

Social

The project has established a three-tier microgrid project cooperation mechanism of "strategy-coordination-service": government departments provide strategic guidance, power supply companies coordinate multi-party cooperation, and primary-level village committees and villagers respond. This provides a replicable and scalable idea and cooperation mechanism for the remote areas to develop new-type power systems and build new energy demonstration areas. The construction and operation of the microgrid project, which drives "golden benefits" (grid-connected sales of surplus electricity) through "green resources" (wind and solar resources), has also created a new energy consumption model for more rural households, offering an effective reference path for rural vitalization that broadens villagers' employment opportunities and income channels.

Application Scenarios

Rural household energy consumption, application of new energy storage in remote areas

绿能小院——
解锁乡村家庭用能新模式

问题与挑战

宁夏固原市地处六盘山区，乡村经济发展相对滞后，多数乡村家庭取暖和做饭用柴火、煤炭和传统火力发电电能。推动农村家庭用能转型主要面临三方面的挑战：一是固原风光资源丰富，但受地域和产业发展影响，农村负荷季节性、分散性明显，风光资源利用率低；二是宣传引导不足，农民对能源转型和建设智能微电网价值认知欠缺，投资意愿不强烈；三是随着乡村振兴推进，农民生活水平提升，有投资储能的经济条件，但政府政策支持力度不够，缺少配套政策。

打造全电零碳新能源主题小院——红色六盘山绿能小院

解决方案

建设绿能小院，打造清洁用能展示场景

国网固原供电公司联合新能源企业出资，在隆德县杨家店村以“风光储荷”一体化思路建设绿能小院。小院中安装的家庭用能微电网，集风、光、储、充、智于一体，并配备2台4千瓦小型风力发电机和16千瓦光伏发电板，电能经逆变器转化为220伏交流电后，可存入30千瓦储能设备。

目前，绿能小院每日风能、光伏发电量可达140千瓦时，满足院内科普厅及3间民宿的用电需求，实现自给自足与稳定运行。剩余电量则可上网销售，实现年销售额1.5万元，在拓宽村民增收渠道的同时，为推广新能源政策与应用提供直观场景。

发挥绿能小院示范效应，打造清洁用能合作试点

国网固原供电公司选取具备建设微电网诉求和基础条件的隆德县杨家店村作为项目建设试点，量身定制风光储充一体化微电网建设推进方案，推进项目“渐进式实施”。

解决能源转型问题，获取余电上网收益

六盘山地区是革命老区、红色教育基地和脱贫攻坚成果巩固主战场，特色农业、文旅、电商等产业发展快，需可靠电力为富民产业升级供能。国网固原供电公司对接政府部门，推动试点村特色产业与旅游住宿餐饮电气化改造，定期提供能效服务；联络村委会及村民代表，在村集体租用场地与乡村农家乐开展分布式光伏试点，实现自发自用、余电上网。可观的村集体与村民微电网试点收益，有效提升了村民投资意愿与信心。

体验式沟通，提升村民合作意愿

国网固原供电公司通过举办能源知识讲座、电力知识小课堂等各类志愿服务活动，向村民普及风能、光能等清洁能源的知识和应用；组织村民参观已建成的风光储充一体化微电网项目，让其亲身感受绿色能源带来的便利和好处，提升村民合作意愿。

红色六盘山绿能小院绿电宣传

多重价值

经济效益

新型电力系统（源网储荷+智能化）在乡村小院的生动实践，满足了乡村振兴进程中日益增长的用能需求。截至2024年底，国网固原供电公司在三个试点村累计建设小型风光发电设施25套、储能设备27组，充分发挥了微电网在能源供应不稳定时的调节能力，实现了24小时稳定可靠供电，助力三个试点村的生产总值、乡村电商销售额、乡村旅游接待游客数量、生态旅游收入大幅增长。为促进当地农业生产的现代化、乡村电商发展以及乡村旅游繁荣做出贡献。

体验式沟通提升村民合作意愿

环境效益

项目累计开展25次村民参观交流活动，让320余名当地村民体验到绿色能源带来的便利，在提升村民生活质量与幸福感的同时，成功将村民对绿色发展的支持率从30%提升至80%。目前，项目已与六盘山地区10余户村民达成风光储一体化微电网建设合作意向，吸引周边10余个乡村参观学习，加速推动绿色电力在乡村场景的普及应用。

社会效益

项目确立“战略-协调-服务”三级微电网项目合作机制，由政府部门提供战略指导、供电企业协调多方合作、基层村委与村民响应，为偏远地区发展新型电力系统、建设新能源示范区提供可复制推广的思路与合作机制。以“绿色”（风光资源）带动“金色”（余电上网）的微电网项目建设和运营，也为更多乡村家庭打造了用能新样板，为拓宽村民就业机会与增收渠道的乡村振兴实践提供了有效参考路径。

应用场景

乡村家庭用能，偏远地区新型储能应用

About “GoldenKey – SDG Solutions”

To implement the assertion that sustainable development is the “golden key” to solving current global problems proposed by Chinese President Xi Jinping and to respond to the Decade of Action, “GoldenKey – SDG Solutions” (referred to as “GoldenKey”) was launched by China Sustainability Tribune in October 2020. The initiative aims to identify, shape, and promote outstanding corporate SDG solutions in China, tackle humanity's greatest challenges and drive sustainable development in China and beyond. In 2021, the GoldenKey was selected as the UN Good Practices (#33560).

As one of China’s most influential platforms for sustainable development, GoldenKey has been held for six consecutive sessions. A total of 2,365 corporate SDG solutions have been collected, with 1,054 selected as outstanding SDG solutions. These solutions span areas such as climate action, well-being for all, rural vitalization, tech4SDG, quality education, action4nature, and zero waste. They stand out for their clear problem definition, outstanding innovation, strong replicability, and significant integrated value, demonstrating the capability and innovation of Chinese enterprises in advancing the SDGs.

With the growing emphasis on green and low-carbon transformation, the number of climate-related corporate solutions featured on the GoldenKey platform has increased each year. Participating enterprises range from central state-owned enterprises and foreign-invested companies to private enterprises of all sizes and sectors, contributing to China’s carbon neutrality goal through efforts in energy transition, low-carbon production and operations, digital empowerment, financial support, as well as low-carbon consumption and living. GoldenKey has become one of China’s most influential and internationally recognized platforms for corporate sustainability exchange and evaluation.

From 2022 to 2025, GoldenKey and State Grid Corporation of China (SGCC) co-hosted the “GoldenKey · SGCC Special” for four consecutive years. The event collects innovative solutions on topics such as low-carbon transformation and green grids and has identified and promoted numerous exemplary practices within the power sector. In 2025, GoldenKey launched the “GoldenKey · Power Sector Special” in partnership with the China Electricity Council (CEC) to further collect and showcase breakthroughs by power enterprises in climate change, China’s 30·60 Decarbonization Goal, and low-carbon transition of clean energy.

GoldenKey continues to optimize and upgrade China’s corporate SDG solutions. Through a series of initiatives, including publications, academic forums, field research, international launches, and demonstration projects, GoldenKey showcases and promotes these solutions on domestic and global platforms such as the China International Import Expo, China International Consumer Products Expo, UN Climate Change Conferences, and IUCN World Conservation Congress. This provides replicable models for more regions worldwide and supports the implementation of the SDGs.

Additionally, GoldenKey and the International School of Low-carbon Studies of Shandong University of Finance and Economics jointly established the GoldenKey Low-Carbon Action Center. Focusing on empowering enterprises in their green and low-carbon transformation, the center provides comprehensive knowledge empowerment and capacity building, covering low-carbon strategy development, carbon management capacity building, green project implementation, application of green financial instruments and climate risk control.

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GoldenKey Annual Event

关于“金钥匙——面向SDG 的中国行动”

为落实中国国家主席习近平关于 “可持续发展是破解当前全球性问题的‘金钥匙’”论断，响应联合国可持续发展目标“行动十年”计划，《可持续发展经济导刊》于2020 年发起“金钥匙——面向SDG 的中国行动”（简称“金钥匙”）。“金钥匙”旨在寻找、塑造、推广来自中国企业贡献SDG 的优秀解决方案，应对人类所面临的重大挑战，为推动中国和全球可持续发展贡献力量。2021 年，“金钥匙”获评联合国SDG 优秀实践（编号：SDG Action#33560）。

“金钥匙”是中国可持续发展领域具有重要影响力的平台型活动，目前已成功举办六届，共征集了2365项行动，其中1054项行动脱颖而出，在气候行动、人人惠享、乡村振兴、科技赋能、优质教育、礼遇自然、无废世界等领域涌现出一批问题定义精准、创新性突出、可复制性强、综合价值显著的 SDG 解决方案，展现出中国企业贡献SDG 的行动力和破解难题的创新力。

随着企业对绿色低碳转型重视程度的增加，金钥匙平台上关注气候议题的企业行动数量逐年增加，涉及企业包括不同规模、不同行业的央企、在华外企以及民营企业等，这些行动分别从能源转型、低碳生产与运营、数字化赋能、金融支持、低碳消费与生活等方面积极参与全球气候治理，贡献中国碳中和目标。“金钥匙”成为中国最具影响力和国际化的企业可持续发展交流与展示活动。

2022-2025年，金钥匙与国家电网连续四年合作举办“金钥匙·国家电网主题赛”，围绕低碳转型、绿色电网等议题征集创新方案，发掘推广了一批行业示范实践；2025 年，金钥匙与中国电力企业联合会启动“金钥匙·电力行业主题赛”，旨在更广泛征集推广电力行业在应对气候变化、服务“双碳”目标、促进能源清洁低碳转型等方面的突破性行动。

“金钥匙”持续对中国企业 SDG 解决方案进行优化升级，举办成果出版、学术研讨、走访调研、国际发布、推广示范等一系列活动，在中国国际进口博览会、中国国际消费品博览会、联合国气候变化缔约方大会、世界自然保护大会等国内外平台上展现和推广中国企业 SDG 解决方案，为全球更多地区提供可复制的经验，助力联合国 2030 可持续发展目标落实。

此外，“金钥匙”还联合山东财经大学中国国际低碳学院成立“金钥匙低碳行动中心”，以推动企业绿色低碳转型为核心，提供涵盖低碳战略制定、碳管理能力提升、绿色项目实践、绿色金融工具应用及气候风险管控等全方位的知识赋能和能力建设。

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金钥匙年度盛典

Read the full version of 2025 Climate Solutions from Chinese Enterprises
获取《中国企业应对气候变化解决方案》完整案例集

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