

Clean Heating Solution for Quchangcheng Village, a Severely Poverty-stricken Village in Hebei Province

About Quchangcheng Village

Quchangcheng village is located in Yangyuan County in the west of Zhangjiakou City, Hebei Province. It is connected with Baishi Mountains in Laiyuan County in the South and Sanggan River in the North. It is 881 m in altitude, 280 km away from Beijing, and 21.5 m² in area, with 1150 households and nearly 3000 people. Before poverty alleviation in 2020, it was the largest deep poverty-stricken village in Hebei. After poverty alleviation, the per capita annual income of villagers increased from 6,500 yuan to 11,000 yuan.

The village has a temperate monsoon climate. It is dry in spring with little rain, hot and short in summer with many thunderstorms. In autumn, the climate is cool and the temperature drops quickly. Winter is cold and dry, with large temperature difference between day and night.

Project Background

Quchangcheng village is located in severe cold area, which is in Zoning B according to architectural thermal design. Not energy-saving, the houses there have poor thermal insulation effect, low seismic grade, and unreasonable function distribution. Besides, the heating area for the villagers is small. They use coal for heating in winter, lasting from November to March, a total of five months. The average household will use about 3 tons of coal in winter. The living energy in the village also includes electricity, fuel wood, straw, etc., and renewable energy is rarely used.

Due to water quality problems, the saline-alkali land in the village covers more than 20,000 mu and the ecological environment is fragile. Therefore, it is a typical community vulnerable to climate change.

In recent years, the government has built a residential community of more than 50,000 square meters in the village through policy support. The villagers will move from exclusive single courtyards to centralized buildings. In addition, Zhangjiakou is an important water conservation functional area and ecological environment support area of Beijing. Therefore, the village must use clean energy to supply heating for the villagers.

Major Problems and Needs

The village can't be connected to municipal central heating network because of its remoteness. Being poor, most villagers are worried about the heating cost after moving to new buildings. Therefore, new residential areas need a clean (i.e. low greenhouse gas emissions) and affordable heating solution.

Although the government has given the village many policy support for poverty alleviation, fundamentally, the sustainable clean heating of the village depends on the development of the village economy and the collective economy. Therefore, the key lies in stimulating its economic vitality through institutional innovation to achieve green economic development.

Project Activities

1. Carried out research on winter heating and domestic energy consumption in the village, wrote and revised reports according to project progress.
2. Solicited clean heating solutions from 11 manufacturers in Beijing, Tianjin and Hebei.
3. Organized experts to review the clean heating solutions.
4. Helped Quchangcheng village to set up a "Water, Electricity and Heating Mutual-Aid Group".
5. Wrote a research report on Sustainable Clean Heating for the village.
6. Wrote a report of "Can Clean Heating in Chinese Northern Rural Areas Become Market-oriented? - Research and Thinking on Sustainable Clean Heating in Quchangcheng Village", and invited experts and insiders to review.
7. Held a policy seminar to promote the reform of the market-oriented system and mechanism of clean heating in Quchangcheng village and northern rural areas.

Project Results

- ※The village has adopted air source heat pump units to supply heating, which is in line with the technical route proposed by project experts.
- ※The village is expected to reduce greenhouse gas emissions by more than 1,000 tons per year.
- ※In research: Completed a "Research Report on Winter Heating and Domestic Energy Consumption in Quchangcheng Village" and a "Special Research Report on Sustainable Clean Heating in Quchangcheng Village" (village version and policy suggestion version).
- ※In technology: Collected the clean heating solutions for Quchangcheng village from 11 manufacturers, and organized experts to evaluate and review the solutions for many times.
- ※In community support: Carried out several conversations with village representatives, village cadres and township cadres on clean heating and the village's collective economy, to inspire the thinking of all parties; Invited villagers to act as project investigators; Supported the establishment of Water, Electricity and Heating Mutual-Aid Group, and provided training for them.
- ※In policy: This project put forward an important issue, namely "Can clean heating in Chinese northern rural areas become marketization", and pointed out that the key is to carry out system and mechanism pilot reform in rural areas and to form market-oriented conditions for the villages, so as to explore the low-carbon transformation strategy. For this, the project has organized professionals and journalists for many discussions.

Project Partners

The Global Environment Facility (GEF) Small Grants Programme (SGP)

The Small Grants Programme (SGP) is a corporate programme of the Global Environment Facility (GEF) implemented by the United Nations Development Programme (UNDP) since 1992. SGP grant-making in over 125 countries promotes community-based innovation, capacity development, and empowerment through sustainable development projects of local civil society organizations with special consideration for indigenous peoples, women, and youth. SGP has supported over 20,000 community-based projects in biodiversity conservation, climate change mitigation and adaptation, prevention of land degradation, protection of international waters, and reduction of the impact of chemicals, while generating sustainable livelihoods.

United Nations Development Programme (UNDP)

UNDP is the leading United Nations organization fighting to end the injustice of poverty, inequality, and climate change. Working with our broad network of experts and partners in over 170 countries, we help nations to build integrated, lasting solutions for people and planet.

UNDP has drawn on world-wide experience for over four decades to assist China both in developing solutions to its own ongoing development challenges, and in its south-south cooperation and engagement in global development. Domestically, our work focuses on Good Governance, Energy & Environment, Poverty Reduction and Disaster Management.

Hebei Energy Planning and Research Center

In 2014, it was registered and established in the Department of Civil Affairs of Hebei Province, with Hebei Development and Reform Commission as its dominant agency. It provides services including consulting, research, evaluation and achievements transfer related to energy. Beijing Xindishikong information Consulting Co., Ltd. is its partner.

Beijing Xindishikong information Consulting Co., Ltd.

It has carried out business in construction, energy and environmental protection for 20 years and achieved a number of breakthrough results. Based on continuous R & D, innovation and long-term industrial resources, the company has conducted sound cooperation with institutions directly under ministries and commissions, scientific research institutions and international organizations. It has unique experience and advantages in project development and design, resource coordination, research, technical consultation and services.



河北深度贫困村 ——曲长城村 清洁供暖解决方案项目

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全球环境基金小额赠款计划

Global Environment Facility (GEF) Small Grants Programme (SGP)

联合国开发计划署

United Nations Development Programme (UNDP)

河北省能源规划研究中心

Hebei Energy Planning and Research Center

北京新地时空信息咨询公司

Beijing Xindishikong Information Consulting Company



曲长城村村庄风貌

关于曲长城村



曲长城村位置

曲长城村是位于河北省张家口市西部阳原县一个单一自然村的行政村。村南恒山山脉南接涿源县白石山山脉，北靠桑干河，海拔高度为881米，距首都北京280公里。该村在2020年脱贫前是河北省最大的深度贫困村，村域面积21.5平方公里，有1150户近3000人。扶贫前，村民人均收入为6500元/年，脱贫后，村民人均收入为11000元/年。

该村属温带季风气候，春季干旱少雨，夏季炎热短促，多雷雨天气，降雨量约占全年的62%-67%。秋季气候凉爽，降温快。冬季寒冷干燥，昼夜温差大。

项目背景

曲长城村所在地区属于建筑热工设计气候分区的严寒地区B区。该村房屋不节能，保温效果差，抗震等级低，功能分布不合理，村民取暖面积小。该村冬季取暖使用燃煤，供暖季从头一年11月到第二年3月，总计5个月时间。户均冬季取暖用燃煤约3吨。村里生活用能还包括电，薪材、秸秆等，很少使用可再生能源。

由于水质问题导致盐碱地面积达2万多亩，生态环境脆弱，因此这里是比较典型的容易受到气候变化影响的社区。



曲长城村农房



煤炉取暖



灶台和炕相连，炕取暖

近年来，政府有关部门派出工作队在该村扶贫，通过政策支持建设了5万多平方米的住宅小区，村民将从独家独院的居住形态改为集中上楼居住。另外，张家口市是执行“京津冀及周边地区清洁空气行动计划”的城市，还需遵守《张家口首都水源涵养功能区和生态环境支撑区建设规划（2019-2035年）》，这些因素决定了曲长城村必须利用清洁能源为村民供暖。



曲长城村新建住宅楼



新建住宅室内空气质量

主要问题和需求

曲长城村位置偏远，没有市政集中供热管网。由于该村经济不振比较贫困，新建住宅小区需要使用清洁能源取暖，且多数村民对迁入楼房后的取暖费用和生活费用存在担忧。因此，该村需要一种既清洁（即低温室气体排放）

又可负担的供暖解决方案，并在建设过程中予以实施。

政府扶贫给予了村庄许多政策支持，但从根本上，该村可持续的清洁供暖有赖于村庄经济和集体经济的整体发展。如何通过体制机制创新激发村庄经济和社会发展活力，是村庄实现绿色转型与增长的关键。



项目人员和村民代表共同沟通清洁供暖事宜

项目活动

- 1、在村庄开展冬季取暖和生活用能调研，根据工程进展撰写和修订报告
- 2、向十一家工作在京津冀一线的厂商征集清洁供暖方案
- 3、组织专家对清洁供暖方案进行评审
- 4、支持曲长城村成立“水电暖互助小组”
- 5、为村里撰写“曲长城村清洁取暖可持续调研报告”
- 6、撰写“北方农村地区清洁取暖能否走向市场化？—关于曲长城村清洁供暖可持续发展的调研与思考”的报告，并请专家和业内人士审议
- 7、召开政策研讨会，推动曲长城村及北方农村清洁取暖市场化体制机制改革



项目人员入户调研后合影



项目人员和参与清洁供暖技术方案竞赛的厂商合影

项目成果

※村庄采取了空气源热泵机组提供清洁能源供暖服务，符合项目调研和专家提出的技术路线；

※该村每年减少温室气体排放1000吨以上；

※在调研方面：完成《曲长城村冬季采暖和生活用能调查报告》、《曲长城村可持续清洁取暖专题调研报告》（村庄版，和政策建议版）；

※在技术方面：征集到11家厂商提供的曲长城村清洁供暖方案，组织专家多次对方案进行评选、审议；



安装在锅炉房屋顶的空气源热泵机组



空气源热泵机组控制室



项目清洁供暖技术方案专家评审会

※在社区支持方面：就清洁取暖和村集体经济发展与村民代表多次对话，与驻村干部和乡镇干部多次交流，以启发各方思维；邀请村民担任项目调查员；支持村里成立水电暖互助小组，并为他们提供培训；

※在政策方面：本项目提出了能够引发思考和讨论的重大问题，即“北方农村清洁取暖能否走向市场化”，并指出解决问题的关键是在农村开展体制机制改革试点，为某些村庄形成市场化条件和因素，以探索实现清洁取暖可持续在内的农村绿色低碳转型与发展路径。为此，项目曾组织专业人士和媒体人士进行过多次讨论。



专家为水电暖互助小组提供培训



北方农村清洁取暖能否走向市场化研讨会

机构介绍

全球环境基金小额赠款计划 (GEF SGP)

小额赠款计划成立于1992年，是全球环境基金的共同项目，由联合国开发计划署负责实施。小额赠款计划在全球125个国家，向当地民间组织，特别是原住民、妇女、青年实施的可持续发展项目提供资金，以促进基于社区的创新、能力建设和赋能。小额赠款计划在全球已经支持了20000多个社区项目，工作领域包括保护生物多样性、减缓和适应气候变化、防止土地退化、保护国际水域、以及减少化学品的影响，同时发展可持续的生计。

联合国开发计划署 (UNDP)

联合国开发计划署是联合国系统为终止贫困、不平等和气候变化而工作的主要机构。与全球170多个国家的专家和伙伴组成的广泛网络合作，联合国开发计划署帮助各国建立人与地球和谐的综合、持续性解决方案。

四十多年来，作为联合国从事发展的全球网络，联合国开发计划署充分利用其全球发展经验，支持中国制定应对发展挑战的解决之道，并为中国开展南南合作和参与全球发展提供协助。联合国开发计划署目前在中国的重点工作领域为：减少贫困、善治、危机预防与恢复及能源与环境。

河北省能源规划研究中心

2014年在河北省民政厅注册成立，河北省发展和改革委员会为其主管单位。业务范围为涉及能源和相关领域的咨询、研究服务、评审和成果转化服务。北京新地时空信息咨询有限责任公司是该中心的合作伙伴。

北京新地时空信息咨询有限责任公司

在建筑、能源和环境保护方面开展业务20年，取得多项具有突破性的成果。基于持续研发与创新，以及长期汇聚的行业资源，公司与部委直属机构、科研机构和国际组织等建立了良好的合作基础，并保持长期合作。在项目开发设计、资源协调，研究和技术咨询及服务等方面具有独特的经验和优势。