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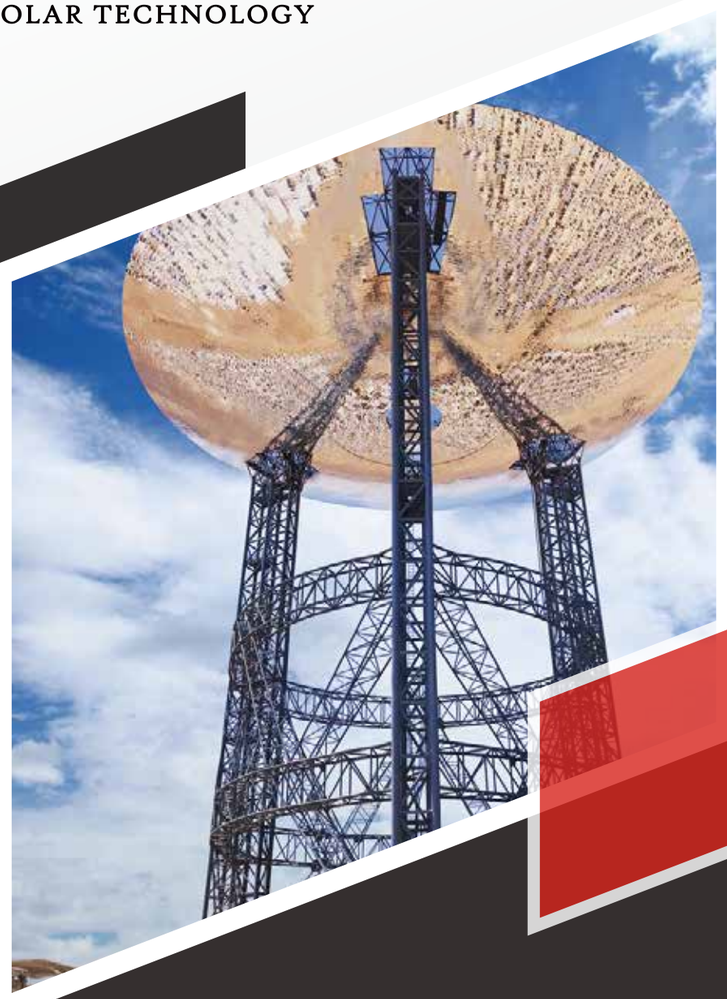
BCP 鑫晨光热
SOLAR TECHNOLOGY



Business book

江苏鑫晨光热技术有限公司
BCP Solar Technology Co.,Ltd.

企业简介
Company Profile

江苏鑫晨光热技术有限公司致力于清洁能源的研究与开发，是国内最早从事太阳能光热发电领域商业探索与技术发展的厂商之一。公司主要从事光热电厂项目开发、工程总包、电厂设计、系统研发、产品开发制造、系统集成、运营维护等在内的全价值产业链业务，涉及土木工程、机械设计、电信、管道、软件、电子、电控、电气、热控、光学、机器视觉、数学等十多个专业技术学科的交叉与集成。

公司拥有国内资深的光热发电领域专家团队，领先的技术研发、产品开发设计团队，专业的供应链管理、质量管理、营销管理、项目管理团队，高效的技术服务和售后运维团队。公司实行集团化运营，下设技术研发中心、工程管理公司、产品制造公司、项目开发公司等，现有核心技术和管理人员200余名，其中博士、硕士人才占比达20%左右。

鑫晨光热始终坚持自主研发、自主创新，走具有独立自主知识产权的技术道路，目前持有各项技术专利42项，其中核心发明专利11项，荣获高新技术企业称号。公司拥有两大核心系统--二次反射镜场集热系统、分布式熔盐储能系统，两个大型工厂--定日镜工厂、二次塔次结构工厂，成为光热电站二次反射商业化应用的先行者之一，是全球唯一的二次反射光热发电系统集成商。

公司秉承“技术领先化、设计流程化、产品工厂化、工程标准化”管理理念，持续为光热发电行业的规模化、低成本、高效率提供更优的解决方案，通过推广熔盐蓄热二次反射塔式光热发电项目，追逐和赶超世界光热领域技术先驱，努力成为科技创新与产业发展的的领跑者。

BCP Solar Technology is committed to the research and development of the clean energy, and BCP Solar Technology is one of the earliest manufacturers engaged in commercial exploration and technology development in the field of concentrating solar power (CSP). The company is mainly engaged in the development of CSP plant projects, engineering procurement construction (EPC), power plant design, system development, product development and manufacturing, system integration, operation and maintenance, etc. This involves the intersection and integration of more than ten professional technical disciplines such as civil engineering, mechanical design, telecommunications, pipeline, software, electronics, electronic control, electrical, thermal control, optics, machine vision, and mathematics.

The BCP Solar Technology has the domestic team of experts in the field of CSP, leading research and development technology, product development and design team, professional supply chain management, quality management, marketing management, project management team, efficient technical services and after-sales operation and maintenance team. The company implements group operations, including technology research and development centers, engineering management companies, product manufacturing companies, project development companies, etc. There are more than 200 core technology and management personnel, and 20% of them are doctors or masters.

BCP Solar Technology always adhered to independent research and development, independent innovation, and has a technical road with independent intellectual property rights. Currently, BCP Solar Technology holds 42 technical patents, including 11 core patents for invention, and has been awarded the title of high-tech enterprise. The company has two core systems, the secondary mirror field collector system and the distributed molten salt energy storage system, and two large factories, the heliostat factory and the secondary tower substructure factory. The BCP Solar Technology is one of the pioneers in the commercial application of beam-down (secondary reflection) in CSP stations. It is the world's only integrator of secondary reflected CSP systems.

Company adheres to the "technology leadership, flow design, product factorization, engineering standardization" management philosophy, continuing to provide better solutions for the scale, low cost and high efficiency of the CSP industry. By promoting the molten salt heat storage beam-down CSP project, the company will pursue and catch up with the technological pioneers in the world of CSP, and strive to be the leader in technological innovation and industrial development.

BCP 鑫晨光热 SOLAR TECHNOLOGY

愚　公 YuGong
专注太阳能光热塔式发电技术
Focusing on the tower CSP technology

先行者 Forerunner
引领太阳能光热产业全价值链
Leading the full value chain of the CSP industry

创导者 Initiator
研发光热二次反射技术
Researching and developing beam-down CSP technology

人才 Talent
以光热领域专家和设计领域行家为基石
The experts in the field of CSP and design are the company’s footstone

技术 Technology
以全球专利二次反射技术和全产业链设计研发能力为载体
The global beam-down technology patent and the full industrial chain design and research capabilities are the company’s carrier

管理 Management
以全价值链的管理战略为理念
The management strategy of the full value chain is the company's philosophy

创新型二次反射技术 Innovative beam-down technology

数百倍的阳光通过二次反射镜，折返到地面上的腔式熔盐吸热器中。白天正常发电时，低温与高温熔盐罐液位相对稳定，吸热器将熔盐升温至570℃，储存于高温熔盐罐中，且储存的多余高温熔盐可以在夜晚用于正常发电，直至高温熔盐罐液面降至最低。系统可以根据电网需求，灵活调配高温熔盐至蒸汽发生器从而控制输出发电量，通过蒸汽推动汽轮机与发电机旋转产生电力，将稳定的清洁能源输送到千家万户。

Hundreds times of the sunlight passes through the beam-down mirror, and then it is reflected to the cavity molten salt thermal absorber on the ground. During the normal power generation in the daytime, the liquid level of the low temperature and high temperature molten salt tank is relatively stable, the thermal absorber heats the molten salt to 570 ° C, and stores that in a high temperature molten salt tank, and the redundant stored high temperature molten salt can be used for normal power generation at night until the liquid level of high temperature molten salt tank drops to the lowest point. The system can flexibly adjust the high-temperature molten salt to the steam generator to control the output generated energy according to the demands of the power grid, the process is that steam drives the steam turbine to spin the electric generator to generate electricity, and then transports the stable clean energy to thousands of households.

技术优势 Technical Advantage

安全可靠 Safe and reliable

- 改变光路聚焦到地面吸热器，彻底解决熔盐安全问题
- 根本上消除了熔盐冻堵风险
- 操作简单，避免运行风险
- 双层储罐设计，熔盐不易泄露

· Change the light path to concentrate light on the thermal absorber on the ground to solve the molten salt safety problem completely.
· Fundamentally eliminates the risk of the freezing of the molten salt.
· Easy to operate, and avoiding operation risks.
· Double-layer tank design, molten salt is not easy to leak.

模块设计 Module design

- 单模块故障时，不影响发电
- 分期建设，模块分组运营，降低电站早期财务压力
- 多塔模块化结构，施工周期短，调试达产更快
- 模块化集成聚光设计，标准化易扩展

· When a single module fails, it does not affect power generation.
· Staging construction, and the module operates in groups, which can reduce the early financial pressure on power stations.
· Multi-tower modular structure, shorter construction period and faster commissioning.
· Modular integrated concentrating design, standardized and easy to expand.

高效节能 Energy efficient

- 低扬程熔盐泵，自用电比例低，节省厂站用电，
- 高镜场光效率，高吸热效率，年化光电转换效率>16%
- 同比发电效率提升，度电成本明显下降

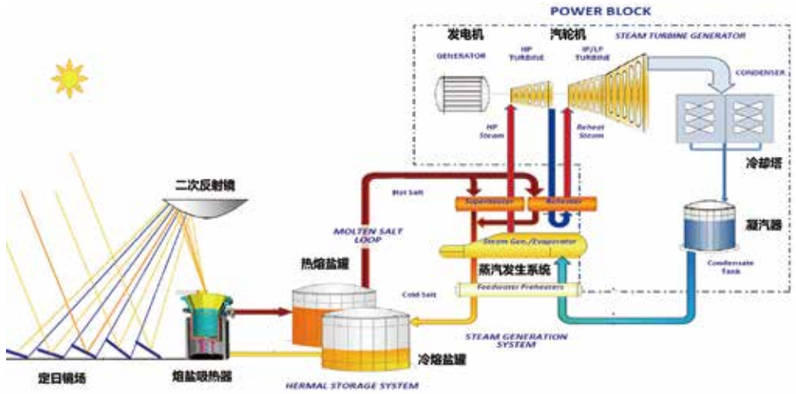
· Low lift molten salt pump, low self-use ratio, saving electricity for the station.
· High optical efficiency of the mirror filed, high heat absorption efficiency, annualized photoelectric conversion efficiency >16%.
· Year-on-year power generation efficiency is improved, and the cost of electricity is significantly reduced.

智能调试 Intelligent commissioning

- 全镜场实行并行控制
- 日常自检，全自动化校正
- 多面定日镜并行调试时间短，指向精度高，实现快速达产
- 系统运行安全，控制部件可靠

· Concurrent control of the entire mirror filed.
· Daily self-inspection, fully automated correction.
· The concurrent operation of multiple heliostats can deliver short commissioning time, high pointing accuracy, and the fast generation can be achieved.
· The system runs safely and the control components are reliable

二次反射技术原理图 Principle of Secondary Reflection Technology



二次反射光热电站解决方案

Beam-down CSP plant solution

模块化系统

单个集热模块完成即可进行定日镜指向调试，首个模块调试参数可直接用于后续模块

多模块可分步建设、分步投资、提前发电

Modular System

Once the single heat collecting module is completed, the heliostat pointing can be debugged. The first module debugging parameters can be directly used for subsequent modules.
The modules can be built and invested in stages, and the generation of the electricity can be achieved in advance.

智能镜场控制系统

自主研发镜场控制系统，保证电站精准高效运行

实现上万台定日镜实现精准对焦、实时并行

镜场配置了备用电源，降低系统运行风险

全场控制关键部件均采用工业标准化设计，保证系统长期稳定运行

Intelligent mirror filed control system

Independent research and development of mirror control system ensures the accurate and efficient operation of the power station.
Tens of thousands heliostats can be controlled concurrently, and the focusing is precise.
The heliostat field is equipped with a backup power supply to reduce the risk of system operation
The key components employed for the whole filed control are adopted the industrial standard design to ensure long-term stable operation of the system.

直接式熔盐吸热器

熔盐直接吸收太阳能辐射，从根本上消除了熔盐冻堵风险

光热转换效率可达90%以上

设备及关键材料完全国产化，技术成熟，大大降低设备成本。

运行难度系数低，可应对复杂的来云工况，冲注、排空、紧急等工况操作流程简单

Direct molten salt heat sink

The molten salt directly absorbs the solar radiation, which fundamentally eliminates the risk of molten salt freezing
Light and heat conversion efficiency can reach 90% or higher
The equipment and key materials are completely localized, the technology is mature, and the equipment cost is greatly reduced.
The operation coefficient of difficulty is low, and it can cope with complicated cloud conditions.
The operation of filling, emptying, emergency, etc. is simple.

双层熔盐储罐

穹顶热胀冷缩不会产生内罐的腰焊缝处的应力集中，安全性大增

保温层中的空气夹层，减少保温材料用量，降低成本

外罐可提前施工，内罐施工不受季节影响，施工效率高

Double-layer molten salt storage tank

The thermal expansion and contraction of the dome does not cause stress concentration at the waist weld of the inner tank, and the safety is increased tremendously.
The air interlayer in the insulation layer can reduce the amount of insulation materials and costs.
The outer tank can be constructed in advance, the inner tank construction is not affected by the season, and the construction efficiency is high.
The bearing basis of the outer tank and the insulation basis of the inner tank are separated, which greatly reduces the difficulty of basis design and construction.

光热电站价值链
Value chain of CSP plants



前期准备 Preparation in advance
可研报告 Feasibility Study Report
项目开发 Project development
商业模式 Business model

定日镜 Heliostat
二次塔 Beam-down tower
吸热器 Heat receiver
熔盐罐 Molten Salt Tank

经验丰富 Rich experience
理念先进 Advanced concept
成本可控 Controllable cost
方案精准 Precision solution

项目开发 Project Development

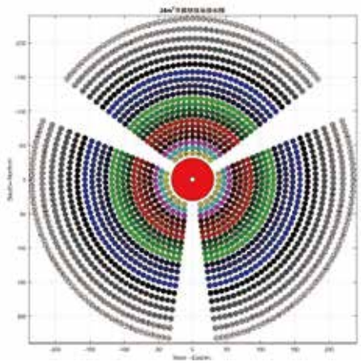
设计 Design

制造与集成 Manufacture & Integration

安装与调试 Installation & Commissioning

运维 Operation & maintenance

概念设计 Conceptual design
定日镜设计 Heliostat design
二次塔设计 Beam-down tower design
直接式熔盐吸热器设计 Direct molten salt heat sink design
管道与储热系统设计 Pipe & Thermal Energy Storage System Design




EPC总包 EPC
项目管理 project management
安装集成 Installation and integration
系统联调 System commissioning

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工程实例
Engineering case

玉门鑫能项目
——全球首个50MW二次反射熔盐塔式技术商业化光热电站

鑫晨光热目前在建的玉门50MW熔盐塔式光热发电项目，位于甘肃省玉门市郑家沙窝光热示范区，距玉门市新市区5公里。该项目于2014年立项，2016年成功入选国家能源局正式发布的20个中国首批光热发电示范项目。项目于2017年开始施工建设，预计于2019年底建设完成并实现并网发电。本项目规划装机容量50MW，采用二次反射太阳能光热发电技术，规划建设15个集热模块，在常规岛储热区配置9小时熔盐储能系统及汽轮发电机组，发电机组年利用小时数可达4300小时，设计年发电量为2.15亿kWh。

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二次反射塔集成

Beam-down tower

定日镜安装

Heliostat installation

储罐安装

Storage tank installation

管道及设备安装

Pipe and equipment installation

The Yumen Xinneng project ——

The first commercial beam-down and molten salt tower CSP plant in the world

The Yumen 50MW molten salt tower CSP project is currently under construction by the BCP Solar Technology. The project is located at the light and heat demonstration area of Zhengjia Shawo, Yumen City, Gansu Province, which is five kilometers away from the new urban area of Yumen City. The project was established in 2014, and it was successfully selected as the first batch of 20 China's CSP demonstration projects by the National Energy Administration in 2016. The project started construction in 2017 and is expected to be completed and achieve the grid-connected power generation by the end of 2019. The planned capacity of the project is 50MW, and it adopts the beam-down CSP generation technology, and 15 collector modules are planned to be constructed. In addition, the 9-hour molten salt energy storage system and the steam turbine generator set are arranged in the conventional island heat storage area. The number of annual available hours can reach 4,300 hours, and the designed power generation is 215 million kWh.

愿景/荣誉
Expectation/Honor

技术引领未来

全球领先的塔式二次反射光热电站技术提供商和方案解决商

全球首个50MW二次反射熔盐塔式技术商业化光热电站

Technology leads the future

The world's leading technology and solution provider of beam-down tower.

The first commercial 50MW beam-down and molten salt tower CSP plant in the world

BCP 鑫晨光热 SOLAR TECHNOLOGY

“鑫晨人”始终追求：

聚光汇能点亮西部沃土，天蓝水净造福后代千秋！

鑫晨光热以客户满意为目标，为千家万户提供取之不竭、绿色环保、稳定输出的清洁能源而不懈奋斗！

‘BCP staff’ always pursue:

The gathering of light can light up the fertile soil in the west, and the good environment will benefit the future generations.

BCP Solar Technology will continue to try our best to provide clean, inexhaustible, green and stable energy for thousands of families with the goal of customer satisfaction.

BCP SOLAR TECHNOLOGY