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企业简介
Company Profile

武汉圣普太阳能科技有限公司
Wuhan Sunnpo Solar Technology Co., Ltd.

- **武汉圣普太阳能科技有限公司成立于2011年5月，注册资本壹亿元，位于武汉经济技术开发区凤亭二路12号，一期工程占地100亩，具有全系列槽式、塔式、菲涅尔式反射镜，二次反射镜（CPC）和聚光光伏反射镜等产品的批量生产能力，产品广泛应用于太阳能光热发电、太阳能中低温热利用和聚光光伏等领域，为全球顾客提供高性价比的产品和服务。**

  Wuhan Sunnpo Solar Technology Co., Ltd., established in May, 2011 with a registered capital of RMB 100 million, is located in No. 12, Fengting Er Rd., Wuhan E&T Development Zone, P. R. China. Sunnpo has a capability for full range solar mirror R&D and manufacture and provides cost effective products and service for customers worldwide, including mirrors for parabolic trough, mirrors for tower and Fresnel system, secondary reflector (CPC) and mirrors for CPV, widely used in the field of CSP power generation, medium-low temperature STE application and CPV area.

- **圣普是国家级高新技术企业，研发团队拥有卓越的创新能力和丰富的研发经验，技术和产品始终在行业领先，可为顾客提供从新产品设计、产品研发到大批量生产全过程的技术支持，为顾客提供专业的解决方案和系统服务。**

  As a National High-Tech Enterprise, Sunnpo has established its place in the industry with excellent innovation ability and rich experience in research and development. Sunnpo is able to provide customers with whole process technical support and professional solutions and systematic services from new product design, product development to mass production.

- **圣普建立了完善的管理体系，通过国际认证机构SGS三体系审核认证（ISO9001、ISO14001和OHSAS18001）。圣普全面引进国际一流制造和检测装备，具备高效、稳定的批量制造能力，产品质量通过第三方认可实验室DLR和PSA的检测，达到国际先进水平。**

  Sunnpo has build up a sound and efficient management system and obtained authentication certificate issued by SGS covering ISO9001, ISO14001and OHSAS18001. By introducing world-class manufacture and testing equipment, Sunnpo has formed an efficient and stable mass production capacity, products have reached international advanced level and are validated by the third party recognized professional institute DLR and PSA.

- **圣普愿与各界携手，以科技创新促进可再生能源的开发和利用，共同开创新兴能源的美好未来。**

  Dedicated to promote the development and utilization of renewable resource with technical innovation, Sunnpo is willing to join hands with all partners to jointly create a better future for green energy.

公司使命： 追求科技创新，促进可再生能源的开发和利用，保护并改善人类生活环境

Mission: Sunnpo is dedicated to pursue for innovative technology and promote the exploitation and utilization of renewable resource, and contributes to the protection and improvement of the living environment of humanbeing.

公司愿景： 成为国际领先的太阳能光热利用反射镜供应商

Vision: To be a global leading professional CSP mirrors supplier.

企业精神： 持续改进，追求卓越

Spirit: Committed to continuous improvement and pursue for excellence.

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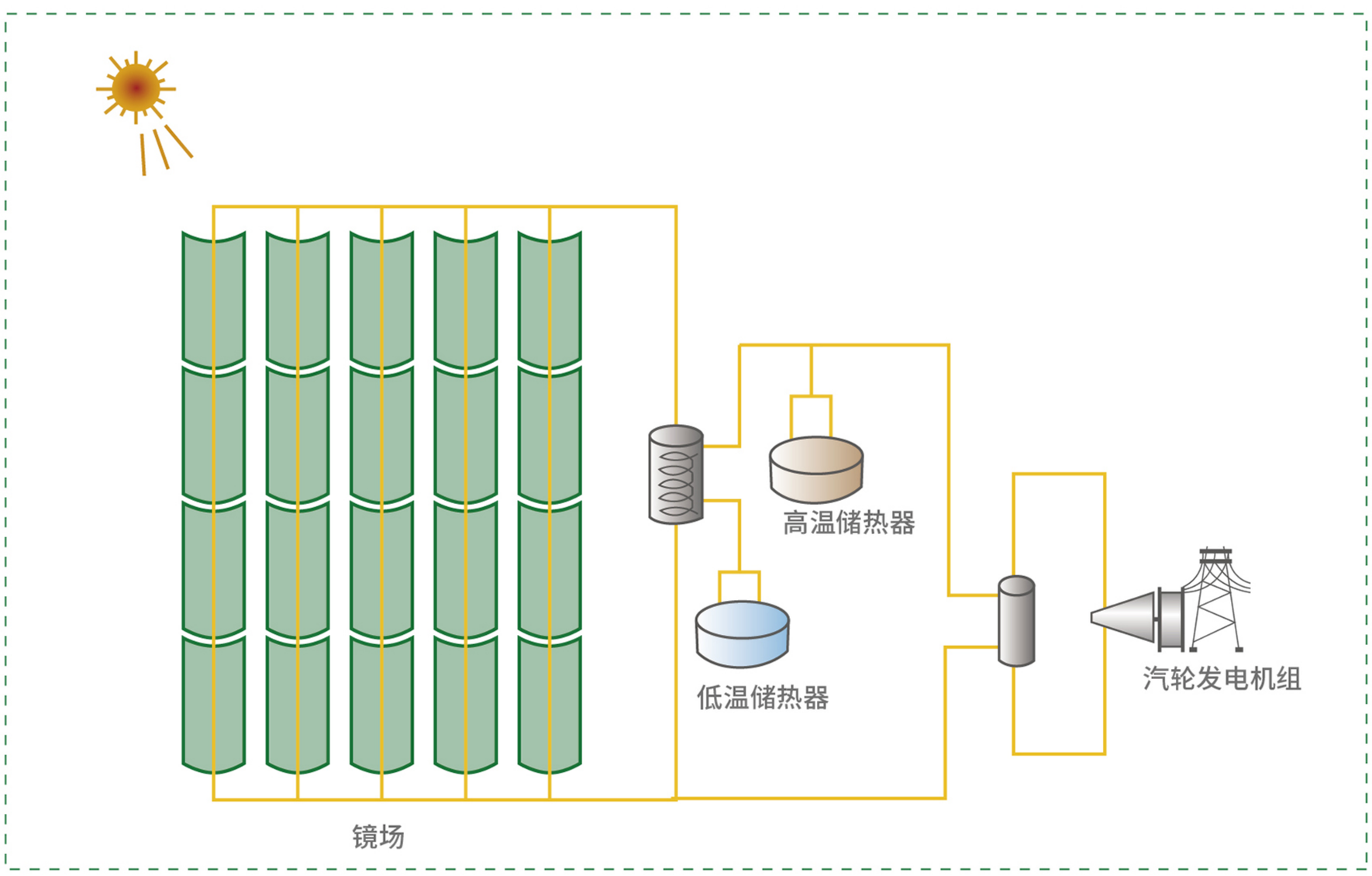
槽式太阳能光热发电

Parabolic Trough System

- 槽式太阳能光热发电系统利用抛物面槽式反射镜，将太阳光反射到位于镜面焦点处的集热管，对其内部的传热介质进行加热，产生高温蒸汽，进而驱动汽轮发电机进行发电。

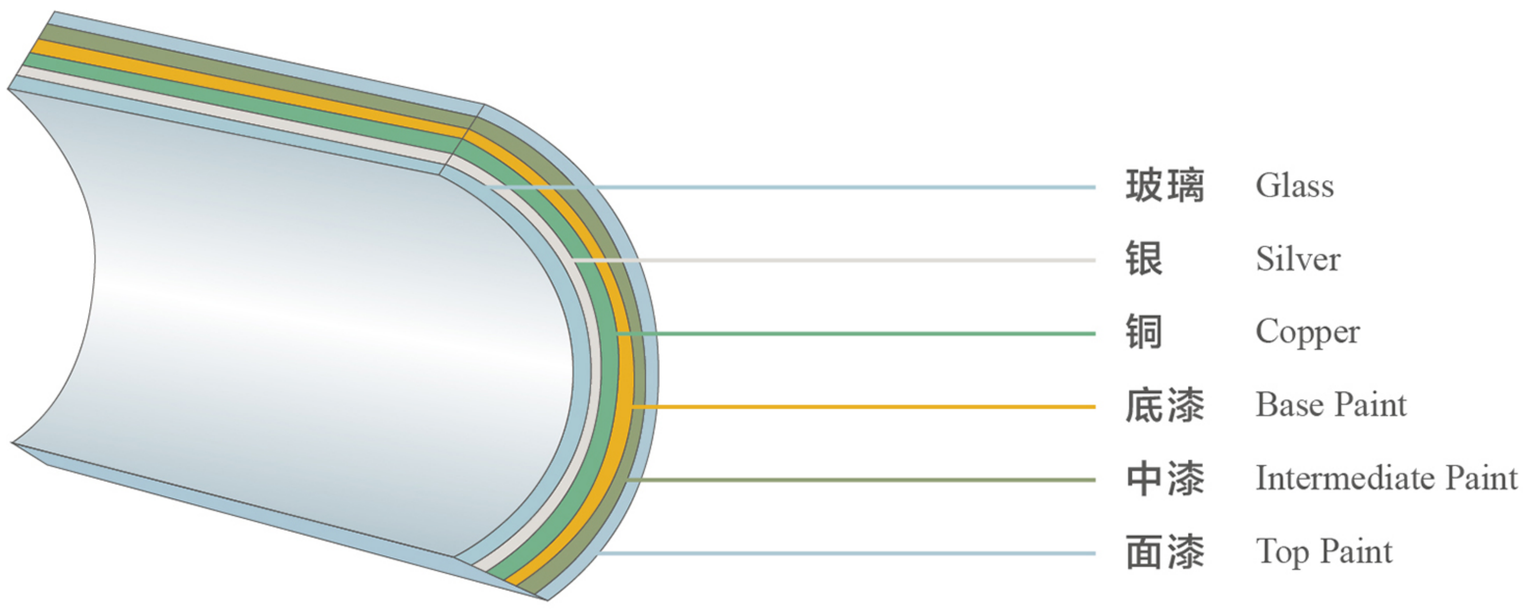
  Using parabolic trough mirrors to reflect the solar radiation to the solar collector tubes, generating steam with heat exchangers and producing electrical power with turbine electrical power generators.



槽式反射镜

Mirrors for Parabolic Trough

- 槽式反射镜以太阳能超白浮法玻璃为基板，将玻璃原片钢化弯曲成型后，在凸面镀制高反射率银层、铜层、保护漆层等功能膜层。
  Using ultra white float glass as substrate, coating silver, copper and protective paint on the convex side after tempering and reshaping the float glass.



产品规格 Specification

类型 Serial No	镜片位置 Mirror Location	集热器开口 Aperture Width	直边长 Length	弧边长 Height	面积 Area	重量 Weight	备注 Notes
		mm	mm	mm	m^2	kg	
SP2	内片 inner	5,000	1,570	1,400	2.2	22	光热发电 CSP
	外片 outer		1,570	1,324	2.1	21	
SP3	内片 inner	5,770	1,700	1,641	2.8	28	
	外片 outer		1,700	1,501	2.6	26	
SP4	内片 inner	6,770	1,570	1,900	3.0	30	
	外片 outer		1,570	1,900	3.0	30	
SP5	内片 inner	7,512	2,030	2,010	4.1	41	
	外片 outer		2,030	2,010	4.1	41	
SP12	镜片 mirror	2,500	1,438	1,357	2.0	20	热利用 STE
SP13	镜片 mirror	2,550	1,570	1,385	2.2	22	
SP15	镜片 mirror	2,550	1,463	1,385	2.0	20	

说明：
Remark:

1）玻璃厚度4mm，尺寸公差±1mm
2）反射镜开口尺寸500~7,512mm，可根据客户需求定制
3）产品反射率高、强度好、寿命长

1) Thickness of mirror: 4mm, size tolerance : ±1mm
2) Size of mirror: 500~7,512mm ,and customized mirrors are available.
3) The mirrors have high reflectivity and long service life.

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UT终极槽钢化玻璃反射镜

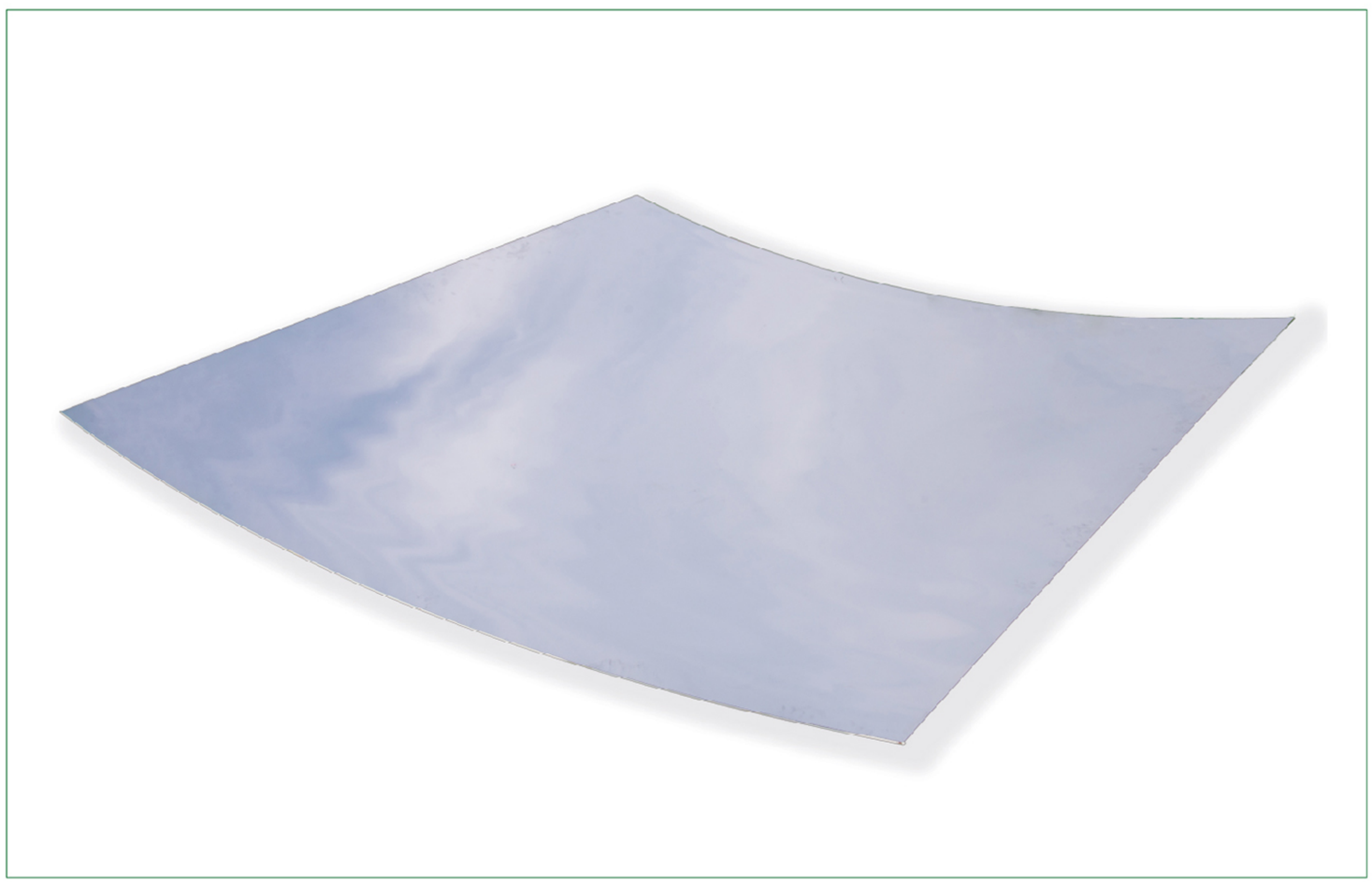
Parobolic Trough Mirrors for Ultimate Trough (UT)

- **2017年圣普率先成功研发出全球首款用于UT终极槽的SP5（RP5）钢化玻璃反射镜，成为全球独家具备批量制造能力的供应商。**
  In 2017 Sunnpo took the lead in developing the parabolic trough mirror SP5(RP5) for UT, and became the first and unique supplier with mass production capability worldwide.

- **SP5钢化玻璃反射镜直边长2,030mm，弧边长2,010mm，是迄今单片尺寸最大的反射镜。**
  The size of SP5 is length 2,030mm and height 2,010mm, which is the biggest size for single solar mirror up to now.

- **UT终极槽等大开口槽式集热器可有效提升聚光比，提高安装效率，降低镜场成本。**
  UT and other trough collector with wide aperture can effectively enhance the concentrating ratio, increase installation efficiency and finally reduce the cost of solar field.

SP5 (2030mm x 2010mm x 4mm)

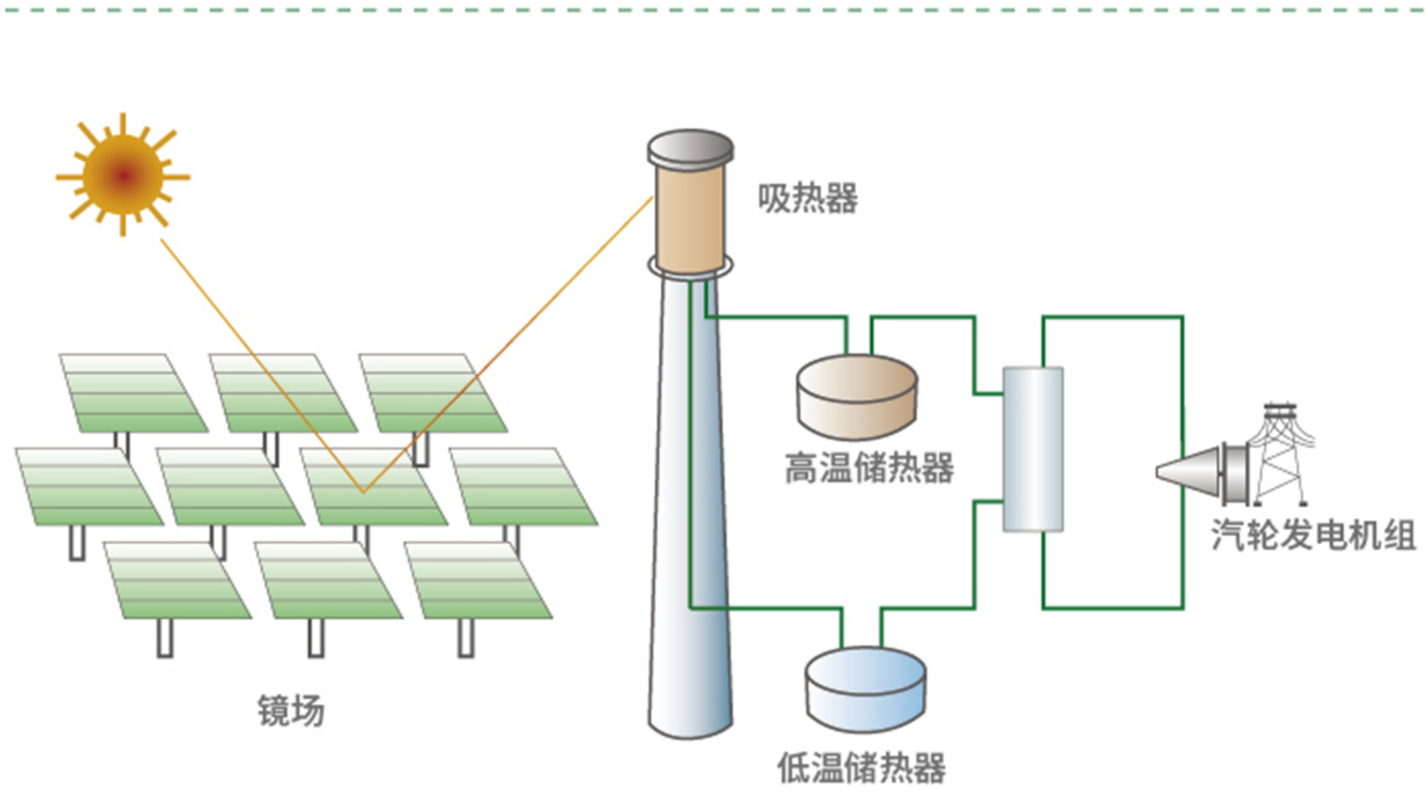


塔式太阳能光热发电

Tower System

- 塔式太阳能光热发电系统利用反射镜跟踪太阳光，将阳光反射并集中到接收塔顶部的吸热器，通过加热吸收器的工质产生高温蒸汽，推动汽轮机进行发电。

  Using solar mirrors to track and reflect the solar radiation onto the thermal absorber installed on the top of the tower, generating steam with heat exchangers and producing electrical power with turbine electrical power generators.



菲涅尔式太阳能光热发电

Fresnel System

- 菲涅尔式太阳能光热发电系统采用一组反射镜聚焦，将阳光反射到集热管上，实现聚焦加热，产生蒸汽，推动汽轮机进行发电。

  Using a set of solar mirrors to reflect and focus the solar radiation onto the collector tube to collect heat and generate steam and produce electrical power with turbine electrical power generators.

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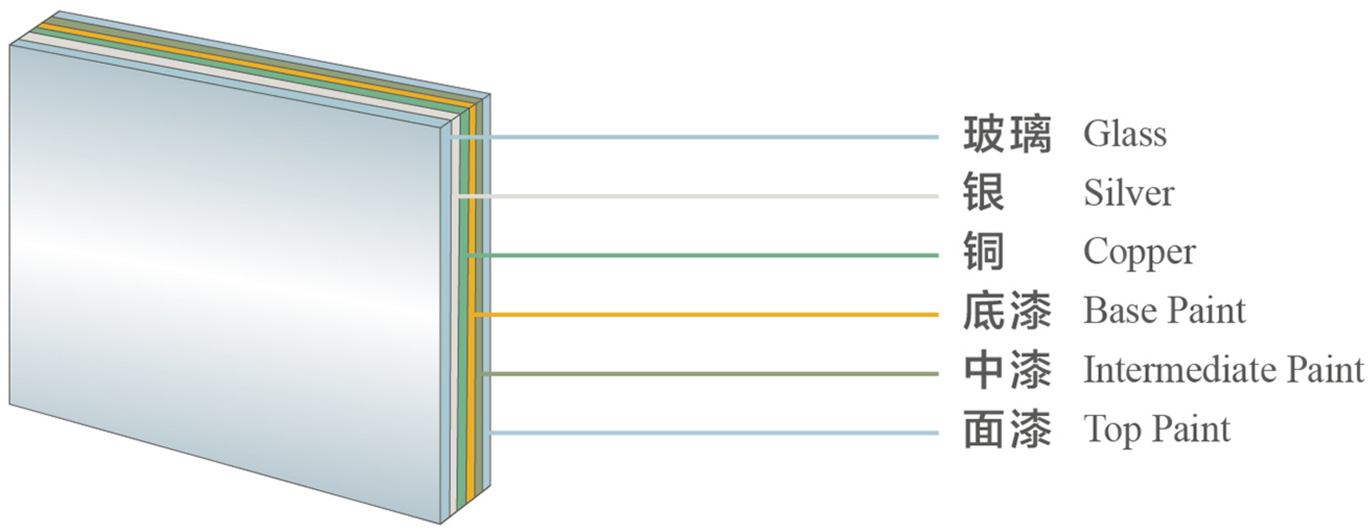
塔式/菲涅尔式平面反射镜

Mirrors for Tower and Fresnel

- 塔式/菲涅尔式平面反射镜以太阳能超白浮法玻璃为基板，在背面镀制高反射率银层、铜层、保护漆层等功能膜层。

  Using ultra white float glass as substrate, coating silver, copper and protective paint on the back.



产品规格 Specification

3,660×2,440mm	1.5mm ~ 6.0mm	≥93.5%	产品规格亦可根据客户需求定制
最大规格 Max size	玻璃厚度 Mirror thickness	4mm银镜反射率 Reflectivity for 4mm mirror	Customized mirror is available.

巨蜥式定日镜用反射镜

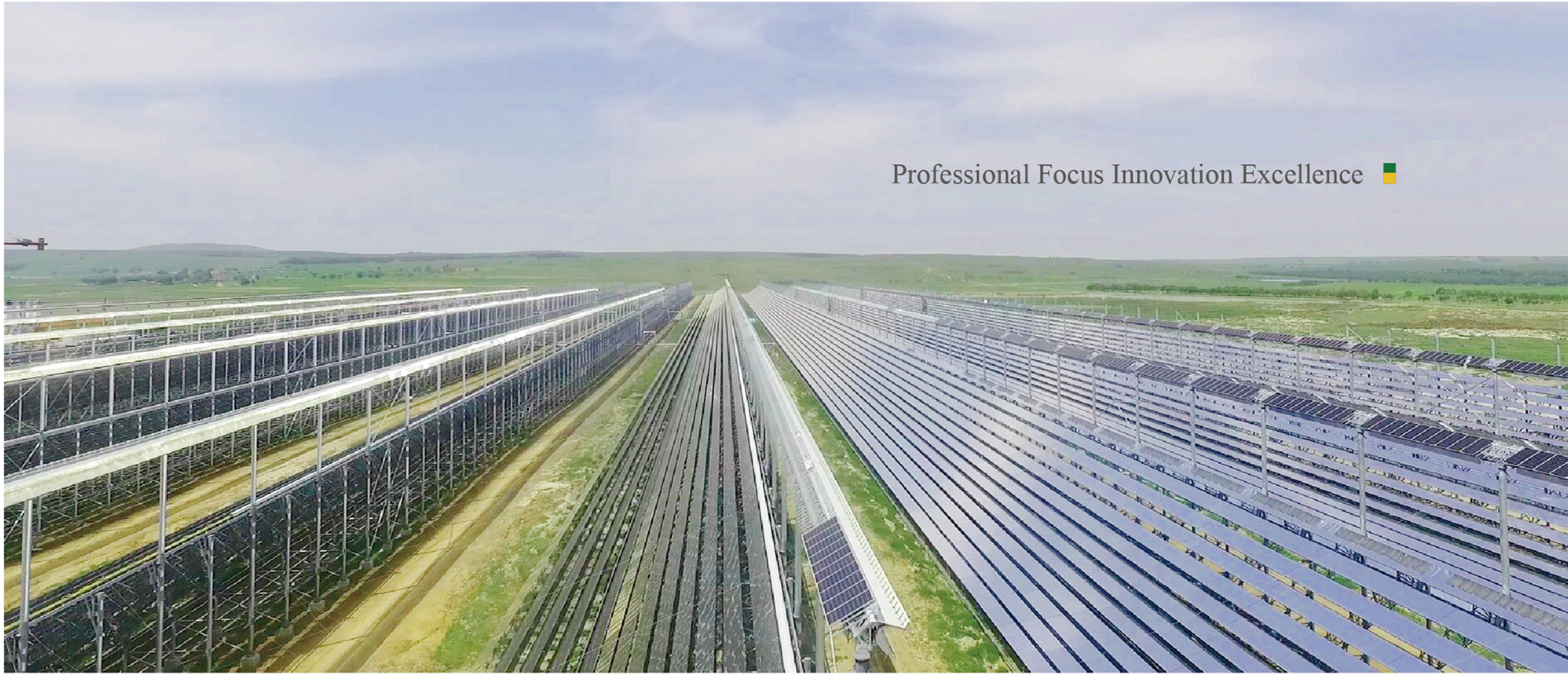
Mirrors for Stellio Heliostat

- 圣普为东方电气集团东方锅炉股份有限公司定制了中电工程哈密50MW熔盐塔式项目巨蜥式定日镜用反射镜。

  The mirrors for stellio heliostat is customized for the 50MW molten salt Solar Power Tower Project in Hami invested by CPECC (China Power Engineering Consulting Group Co., Ltd.).

- 每个反射镜单元由正、反梯形镜和五边形中间镜组成，可减少阴影及遮挡，确保低散光效果，防止聚光损失或吸热器过大。

  Consisting of 10 ladder-shaped mirrors and a pentagonal mirror in the center, the set of mirror is designed to reduce shadow and ensure low astigmatism to avoid light loss or oversized heat absorber.



二次反射镜（CPC）

Secondary Reflector

- 二次反射镜安装于二次反射塔或集热管的顶部，利用椭圆的光学特性，将一次反射镜聚集的光线再次反射回到焦点上，为集热装置加热。
  The secondary reflector is installed on the top of the secondary reflect tower or collector tube, and reflects the solar radiation again back to the focus to collect heat for the thermal collector.

> 圣普可按顾客要求定制塔式/菲涅尔二次反射镜。
> Customized mirror is available.

> 圣普为华强兆阳张家口15MW菲涅尔光热发电项目独家研发了二次反射镜。抛物面非对称，曲率变化大。
> The secondary reflector exclusively made and supplied by Sunnpo for the Huaqiang TeraSolar 15MW Fresnel System，has non-symmetrical paraboloid and radians vary greatly.

> 圣普凭借卓越的创新能力，自主、高效地完成产品研发和批量工业化生产。
> Sunnpo completed the development and mass production effectively and independently with excellent initiative and innovation.

> 产品反射率高、型面精度高、一致性好。
> The mirrors have high reflect ratio, accurate shape and good conformity.

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碟式太阳能光热发电

Parabolic Dish System

- 碟式太阳能光热发电系统是利用旋转抛物面的碟式反射镜将太阳光聚集到焦点上的接收器，接收器内的传热工质被加热，驱动斯特林发电机组进行发电。

  Parabolic dish systems consist of a parabolic-shaped point focus concentrator in the form of a dish that reflects solar radiation onto a receiver mounted at the focal point. The collected heat is utilized to drive the Stirling generator sets to make electricity.

碟式抛物面反射镜

Mirrors for Parabolic Dish

- 碟式反射镜以太阳能超白浮法玻璃为基板，加工成型后，在凸面镀制高反射率银层、铜层、保护漆层等功能膜层。

  Using ultra white float glass as substrate, coating silver, copper and protective paint on the convex side after pre-process.

- 圣普采用自主核心技术研发的蝶式反射镜型面精度高、聚光性能好。

  The dish mirrors developed by Sunnpo have high reflectivity and accuracy in concentrating.

太阳能中低温热利用
Medium-Low Temperature STE Application

- 太阳能光热系统可广泛运用于制冷采暖、石油开采、海水淡化、工业应用等领域。
  The Solar Thermal Energy system can be widely applied in the field of refrigeration & heating, enhanced oil recovery, desalination and other industry.

太阳能光热制冷和采暖
Solar Thermal Refrigeration & Heating System

太阳能光热制冷系统是一种采用非氟利昂制冷剂、使用热能驱动的吸收式制冷系统。
Solar thermal refrigeration system is a kind of non-freon refrigerant, which uses heat driven absorption refrigerating system.

太阳能光热采暖利用太阳能集热器汇聚太阳能将水等介质加热，通过管路输送到散热器产生热量，从而为建筑物供热。
Solar thermal heating system is a kind of heating system for buildings, which concentrates solar to heat water or other medium to get to the radiator to generate heat.

太阳能光热石油开采
Solar Enhanced Oil Recovery

利用太阳能集热器汇聚后的太阳能对水加热，得到稠油开采所需要的热水或蒸汽。
Using the concentrated solar to heat water, the steam or hot water could be generated as required in the oil extraction.

太阳能光热海水淡化
Solar Desalination

利用太阳能集热器汇聚后的太阳能加热海水，从而蒸馏出淡水。
To desalinate seawater to produce fresh water, using the concentrated solar to heat and distill seawater to produce fresh water.

太阳能工业应用
Other STE Applications in Industry

太阳能光热系统还可应用于纺织、印染、造纸、橡胶、木材等各种需要热蒸汽的生产领域，利用太阳能集热器汇聚后的太阳能加热水，替代煤炭或天然气等非再生能源的消耗。
Concentrated solar can be widely used in any occasion in production that requires steam, such as textile, printing and dyeing, papermaking, rubber production and wood processing. By using concentrated solar to heat water instead of burning coal or natural gas can reduce environment pollution and save natural resources.

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生产能力

Capacity

300MW

年产槽式反射镜

Annual capacity for trough mirrors

400MW

年产塔式和菲涅尔式平面反射镜

Annual capacity for tower&fresnel mirrors

管理体系认证

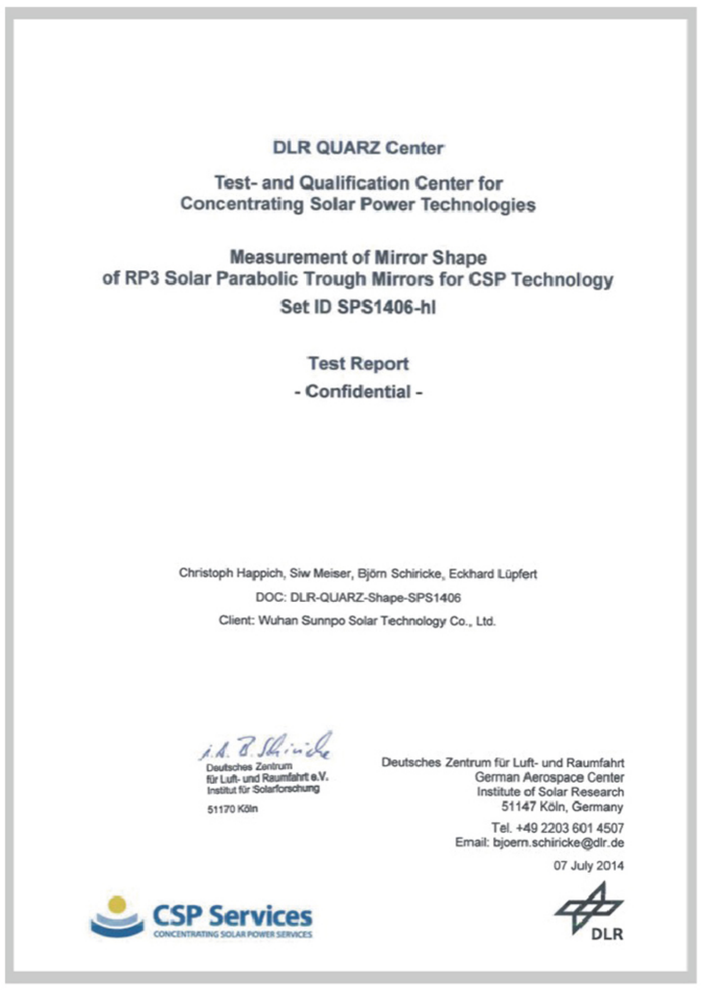
Management System

检测报告

Validation Report

- **产品通过了第三方认可实验室德国DLR和西班牙PSA等的检测。**

  The mirrors are validated by the third party recognized professional institute DLR and PSA.



DLR QUARZ Center

Test- and Qualification Center for
Concentrating Solar Power Technologies

Measurement of Mirror Shape
of RP3 Solar Parabolic Trough Mirrors for CSP Technology
Set ID SPS1406-hl

Test Report
- Confidential -

Christoph Happich, Siw Meiser, Björn Schiricke, Eckhard Lüpfert
DOC: DLR-QUARZ-Shape-SPS1406
Client: Wuhan Sunnpo Solar Technology Co., Ltd.

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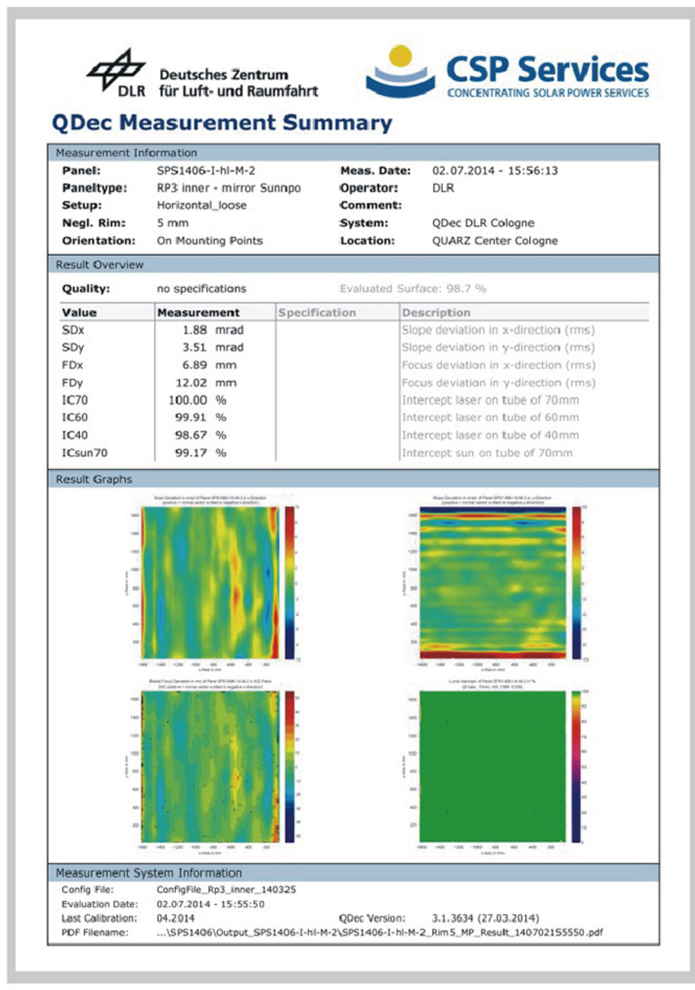
07 July 2014

CSP Services
CONCENTRATING SOLAR POWER SERVICES

DLR



Deutsches Zentrum für Luft- und Raumfahrt

CSP Services
CONCENTRATING SOLAR POWER SERVICES

QDec Measurement Summary

Measurement Information			
Panel:	SPS1406-I-hl-M-2	**Meas. Date:**	02.07.2014 - 15:56:13
Paneltype:	RP3 inner - mirror Sunnpo	**Operator:**	DLR
Setup:	Horizontal_loose	**Comment:**	
Negl. Rim:	5 mm	**System:**	QDec DLR Cologne
Orientation:	On Mounting Points	**Location:**	QUARZ Center Cologne

Result Overview

Quality: no specifications — Evaluated Surface: 98.7 %

Value	Measurement	Specification	Description
SDx	1.88 mrad		Slope deviation in x-direction (rms)
SDy	3.51 mrad		Slope deviation in y-direction (rms)
FDx	6.89 mm		Focus deviation in x-direction (rms)
FDy	12.02 mm		Focus deviation in y-direction (rms)
IC70	100.00 %		Intercept laser on tube of 70mm
IC60	99.91 %		Intercept laser on tube of 60mm
IC40	98.67 %		Intercept laser on tube of 40mm
ICsun70	99.17 %		Intercept sun on tube of 70mm

Result Graphs

Measurement System Information

Config File:	ConfigFile_Rp3_inner_140325		
Evaluation Date:	02.07.2014 - 15:55:50		
Last Calibration:	04.2014	QDec Version:	3.1.3634 (27.03.2014)
PDF Filename:	...\SPS1406\Output_SPS1406-I-hl-M-2\SPS1406-I-hl-M-2_Rim5_MP_Result_140702155550.pdf		

Optical Ageing Characterization Laboratory

Durability tests results of solar reflectors, manufactured
by Wuhan Sunnpo Solar Technology Co.

DLR

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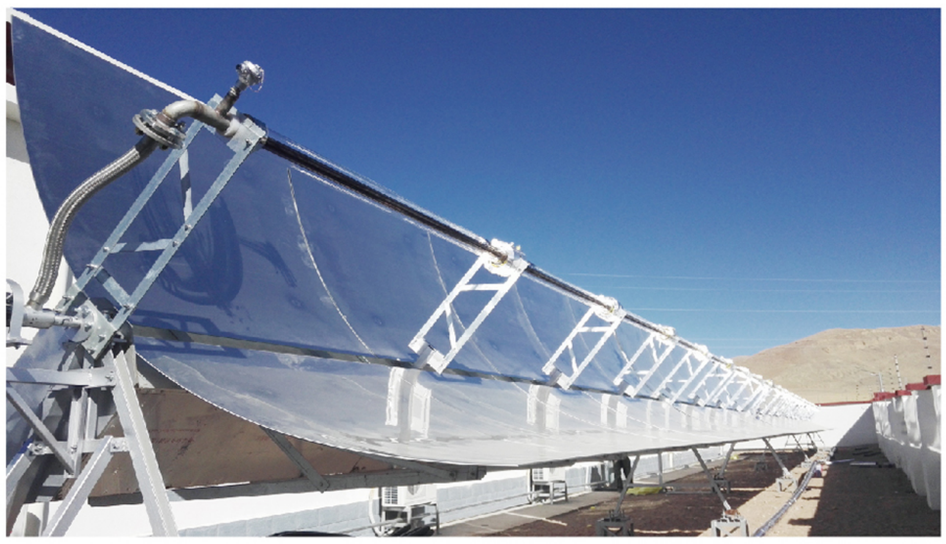
部分应用案例
Part of the Project

> 太阳能光热发电
Project for CSP

● **中电工程哈密50MW熔盐塔式光热发电示范项目**
The 50MW molten salt Solar Power Tower Project in Hami invested by CPECC

● **华强兆阳张家口15MW菲涅尔光热发电项目**
The Huaqiang TeraSolar 15MW Fresnel System in Zhangjiakou

> 太阳能中低温热利用
Project for Solar Thermal Energy

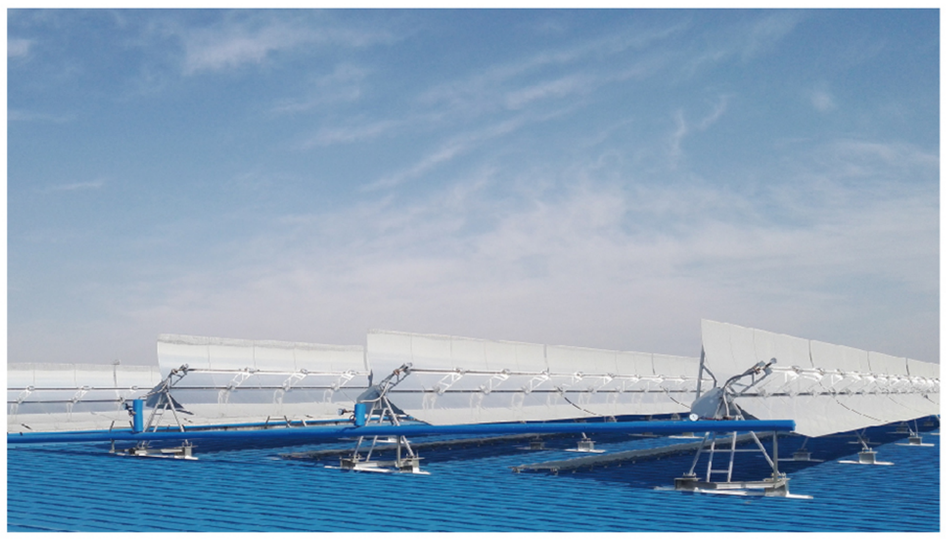


● 西藏日喀则岗巴县光伏电站太阳能供暖项目
Solar thermal heating project for a photovoltaic power station in Shigatse, Tibet

● 新疆轮台基地中石化咸水淡化项目
The desalination project of a Sinopec base in Xinjiang

● 新疆伊宁抗病毒中心太阳能供暖项目
Solar thermal heating project for the Yining Anti-viral Center in Xinjiang

● 西藏拉萨第十五幼儿园太阳能供暖项目
Solar thermal heating project for the No.15 kindergarten in Lhasa, Tibet



● 江苏常州科利达公司光热蒸汽项目
Solar thermal steam project for KLD Co. in Jiangsu Province

● 江苏常州夏博士公司光热蒸汽项目
Solar thermal steam project for Doctor Xia Co. in Jiangsu Province

专业 专注 创新 卓越

Professional Focus Innovation Excellence

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