



CSP Technology and Industry Development in China

China National Solar Thermal Energy Alliance

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国家光热联盟

1MW solar tower system-IEECAS



2012



1MW parabolic trough system-IEECAS



2018

10MW solar tower plant - Supcon



ON Sep. , 2014, NDRC approved a FiT of 1.2RMB/kWh for 10MW Supcon solar tower project.



10MW solar tower plant -Shouhang



15MW Modified Linear Fresnel System



TeraSolar , concrete thermal storage



Dish Stirling System-Great Ocean Energy



Great Ocean Energy

Projects + Feed in Tariff

- on Sep.23, **2015** , NEA issued a notice on **organizing a number of CSP demonstration projects.**
- one month later, applied numbers in each province:
 - ✓ Gansu Province: 32, Inner Mongolia: 23, Qinghai: 16, Xinjiang: 11, Hebei: 6

CSP projects applied

Technologies	P r o j e c t number	T o t a l capacity	%	m e a n F i T p r o p o s e d (RMB/kWh)
PT	60	4.437GW	50.2	1.2460
Tower	36	3.325GW	37.65	1.2399
Dish	8	560MW	6.34	1.2487
Fresnel	7	510MW	5.77	1.2067
	111	8.9GW		Average FiT: 1.2418

FiT for CSP projects

- ◆ On August 29, 2016, NDRC issued the benchmark tariff policy of CSP, approved the benchmark FiT of **1.15 RMB/kWh**, and this price is only suitable for the demonstration projects organized by the NEA in 2016.
- ◆ On September 13, 2016, NEA issued the CSP demonstration project list, with a total number of **20 projects** and a capacity of **1.349GW**, respectively located in Qinghai, Gansu, Hebei Province, the Inner Mongolian and Xinjiang Autonomous Region. In principle, the demonstration projects should be completed and put into production **by the end of 2018**.

9 solar tower projects (1)

No.	Investor	Technology	Location	Technology supplier and system integator	Capacity (MW)	Efficiency at desing point	Proposed FiT
1	Qinghai Supcon Solar Technology Co.,Ltd	molten salt, 6h	Delingha, Qinghai Province	Zhejiang Supcon Solar Technology Co.,Ltd	50	18%	1.198
2	Beijing Shouhang IHW Resources	molten salt, 11h	Dunhuang , Gansu Province	SunCan	100	16.01%	1.23
3	Northwest Engineering Corporation Limited of Power China	molten salt, 6h	Gonghe, Qinghai Province	Zhejiang Supcon Solar Technology Co.,Ltd/ Northwest	50	15.54%	1.1796
4	Northwest Electric Power Design Institute Co., Ltd. of China Power Engineering	molten salt, 8h	Hami, Xinjiang Autonom ous Region	Zhejiang Supcon Solar Technology Co.,Ltd/ Northwest Electric Power	50	15.50%	1.197

9 solar tower projects (2)

No.	Investor	Technology	Location	Technology supplier and system integrator	Capacity (MW)	Efficiency at desing point	Proposed FiT
5	Huanghe Hydropower Development Co., Ltd of State Power Investment Corporation	Water/steam , molten salt, 3.7h	Delingha, Qinghai Province	Brightsource Energy/ Northwest Electric Power Design Institute Co., Ltd. of China Power Engineering Consulting Group	135	15%	1.188
6	China Three Gorges New Energy Co., Ltd	molten salt, 8h	Jinta, Gansu Province	SunCan/Northwest Electric Power Design Institute Co., Ltd. of China Power	100	15.82%	1.182
7	Dahua Engineering Management (Group) Co., Ltd/Institute of	Water/steam , molten salt, 4h	Shangyi, Hebei Province	Institute of Electrical Engineering of the Chinese Academy of Sciences	50	17%	1.26
8	Yunmen Xinneng Solar Thermal No. 1 Power Company	beam down, molten salt, 6h	Yunmen, Gansu Province	Shanghai Parasol Renewable Energy Company/ XinChen CSP Company	50	18.50%	1.2367
9	Beijing Guohua Electric Power	molten salt, 10h	Yunmen, Gansu Province	SunCan	100	16.50%	1.245

7 PT projects

No.	Investor	Technology	Location	Technology supplier and system integrator	Capacity (MW)	Efficiency at desing point	Proposed FIT
10	Royal Tech CSP Limited	Thermal oil, molten salt, 7h	Yunmen, Gansu Province	Royal Tech CSP Limited	50	24.60%	1.234
11	Shenzhen Gold Vanadium Energy Technology Co., Ltd	Molten salt, 15h	Akesai, Gansu Province	Tianjin Binhai Solar Thermal Power Investment Co., Ltd	50	21%	1.194
12	Rayspower Energy Group Co., Ltd	Thermal oil, molten salt, 7h	Yunmen, Gansu Province	Rayspower Energy Group Co., Ltd	50	24.60%	1.197
13	Inner Mongolia Royal Tech New Energy Co.,Ltd/China Shipbuilding Industry Corp (CSIC)	Thermal oil, molten salt, 4h	Urat Middle Banner, Inner Mongolia	Royal Tech CSP Limited/ Inner Mongolia Royal Tech New Energy Co.,Ltd	100	26.76%	1.224
14	CGN Delingha Solar Energy Development Co.,Ltd	Thermal oil, molten salt, 9h	Delingha, Qinghai Province	CGN Solar Energy Development Co.,Ltd	50	14.03%	1.2012
15	CECEP Gansu Wuwei Solar Energy Co, Ltd	Thermal oil, molten salt, 7h	Wuwei, Gansu Province	Royal Tech CSP Limited/ CECEP Solar Energy Co, Ltd	100	14%	1.269
16	Zhongyang Zhangjiakou Chabei Energy Co, Ltd	Molten salt, 16h	Zhangjiakou, Hebei Province	Tianyuan Group/ Zhongyang Zhangjiakou Chabei Energy Co, Ltd	64	21.50%	1.2

4 Linear Fresnel projects

No.	Investor	Technology	Location	Technology supplier and system integrator	Capacity (MW)	Efficiency at desing point	Proposed FiT
17	Lanzhou Dacheng Technology Co, Ltd	Molten salt, 13h	Dunhuang, Gansu Province	Lanzhou Dacheng Technology Co, Ltd	50	16.70%	1.209
18	Huaneng North United Power Co., Ltd	Thermal oil, molten salt, 6h	Urat Middle Banner, Inner Mongolia	Huaneng Clean Energy Research Institute	50	18.50%	1.2476
19	CITIC Zhangbei New Energy Development Co.,Ltd	Water/steam, concrete, 14h	Zhangbei, Hebei Province	Beijing TeraSolar Photothermal Technologies Co., Ltd	50	10.50%	1.22
20	Zhangbei TeraSolar Company	Water/steam, concrete, 14h	Zhangbei, Hebei Province	Beijing TeraSolar Photothermal Technologies Co., Ltd	50	11.90%	1.12



New Timetables for CSP projects

- ◆ A promise letter was submitted to the NEA this Feb. 20 to 16.
- ✓ 5 projects before 2018
- ✓ 9 projects before 2019
- ✓ 2 projects before 2020
- ◆ An electricity price reduction mechanism for overdue projects will be established. The specific price level will otherwise be clearly stated by the National Development and Reform Commission.
- ◆ 16 to 14. 4 projects has high chance to generate electricity before 2018.

第四届中国太阳能热发电大会

China Solar Thermal Electricity Conference 2018

中国·常州 | 2018年9月12日-14日
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China Guangdong Nuclear (CGN) Delingha 50MW CSP project



Shouhang Dunhuang 100MW solar tower plant



Supcon 50MW solar tower plant



The background of the slide is a photograph of a large, empty stadium. The stadium's seating tiers are visible on both sides, receding into the distance. The sky is a mix of orange, yellow, and blue, indicating a sunset or sunrise. The overall atmosphere is serene and grand.

Thank for your attention!

谢谢！

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