

In the third of a series of four blogs, solar pioneer Philip Wolfe lists the world's largest solar parks. In these articles, a 'solar park' is defined as a group of co-located solar power plants.

The world's largest solar parks

The concept of the 'solar park' was first developed in India and China a decade ago. Regional energy agencies in states such as Gujarat, Qinghai and Gansu identified suitable locations where several solar power plants could be sited together. The coordinators provided for high-capacity grid connections and often also procured or provided the land.

Probably the most notable early example is the Charanka Solar Park in Patan district. When this was first opened in 2012 by Gujarat's then chief minister, Narendra Modi, it had a combined capacity of 224 MW_P from 19 individual solar power plants, of which the largest were 25_P MW each. It has since been expanded towards 500 MW of overall capacity.

The largest solar parks now house up to 80 individual solar power plants, achieving higher capacity than [single plants](#). The concept has subsequently been adopted elsewhere in Asia and the Middle East. A similar approach was implemented by the Bureau of Land Management in the USA, when it designated several 'Solar Energy Zones', such as that at Dry Lake in Nevada.

The following list selects the solar parks which we believe have at least 1 GW_{AC} of current operational capacity (typically equivalent to 1.25 GW_P). The position each held in our 2019 lists are shown in brackets. The list is still dominated by China and India, joined by single entries in Egypt and the UAE, and a likely future entrant in the USA.

#1. Golmud Desert Solar Park 2.8 GW_{AC} (1)



Located in the desert to the East of Golmud in Qinghai Province in China [this park](#) now houses about 80 solar power plants with a combined capacity of over 2.8 GW_{AC} – up by a gigawatt since our last list.

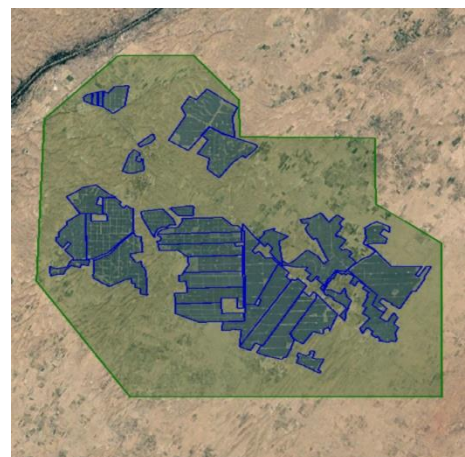
It includes a 200 MW 'power tower' CSP plant. Its 160 sq.km. also house a 200 MW_P PV plant by Huanghe – the largest individual solar power plant in the world, when it was first built in 2011.

It is not known what the final capacity will be, but the overall area would be sufficient for an eventual 4 to 5 GW.

#2. Bhadla Solar Park 2.7 GW (2)

[Bhadla Solar Park](#) covering about 160 sq.km. at Bhadlachuhron Ki in the north of India's Rajasthan, has also expanded by about 1 GW since 2019, with several new plants, the largest of which is 300 MW.

It will eventually accommodate nearly 30 solar plants with a total capacity of 3.5 GW_{AC}.



#3. Longyangxia 2.4 GW (plant 3)



This [group of plants](#) beside the Longyangxia Reservoir in Eastern Qinghai delivers its power in conjunction with the nearby hydro-electricity plant. It has been progressively expanded since the first phase in 2013 and now stands at an estimated 2.4 GW.

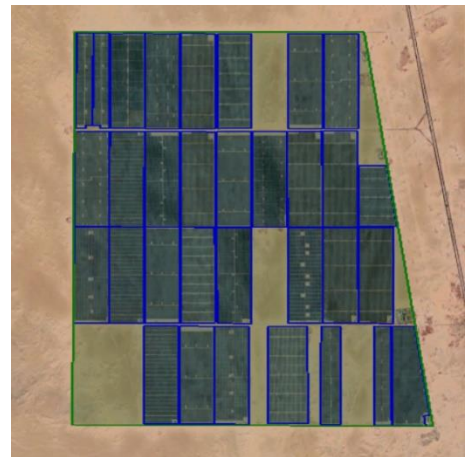
United Photovoltaics' smaller Tara Beach Solar Park is visible to the north and the 50 MW Gonghe CSP power tower to the East.

Originally developed by China Power Investment – now State Power Investment Corporation (SPIC) – this was previously listed as an individual plant (where it ranked #3).

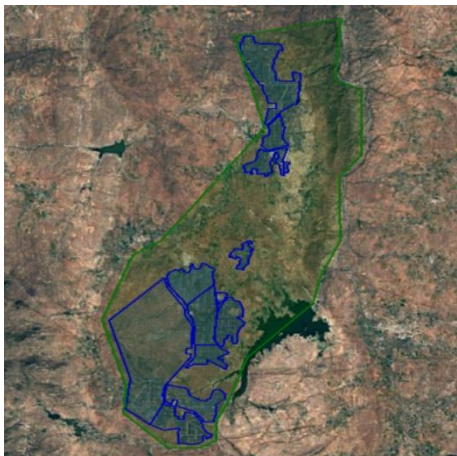
#4. Benban Solar Park, Egypt 1.3 GW (9)

This compact [solar park](#) scraped into our last list before it was officially commissioned. It is now largely complete with 27 blocks mostly of a nominal 50 MW, though there is space for perhaps a further 400 MW.

The solar park covers 37 sq.km. in the desert in Egypt's Aswan governorate. It is the only solar park outside Asia on this list.



#5. NP Kunta Solar Park 1.2 GW (7)



Also known as Anantapur Ultra Mega Solar Park, this solar park covers some 90 sq.km. in the [Nambula Pulakunta](#) district of Andhra Pradesh.

Promoted by Andhra Pradesh Solar Power Corporation, it is scheduled for a total capacity of 1.5 GW, of which about 1.2 GW is currently believed to be operational, though the site has been dogged by various delays.

#6. Sheikh Mohammed Bin Rashid Al Maktoum Solar Park 1.03 GW (18)

The fourth and fifth phases are now under construction to the north-east and south of [this solar park](#) in the south of the UAE emirate of Dubai. Phase IV includes CSP plants using both parabolic trough and power tower technologies.

One of only two listed parks outside China and India, the eventual capacity of this complex is scheduled to be 5 GW, which may make it the largest in the world, covering up to 200 sq.km.



#7. Jinchuan, Gansu 1.03 GW (5)

Jinchuan in China's Gansu province is almost surrounded by solar power plants. The [solar park](#) covers almost 90 sq.km. of semi-desert to the north west of the city, while a further cluster of projects is to the south.

The solar park has now been increased to 15 plants with a combined capacity just over 1 GW. Jinchuan's largest plant has a capacity over 200 MW.



#8. Danangouxiang 1.02 GW (-)



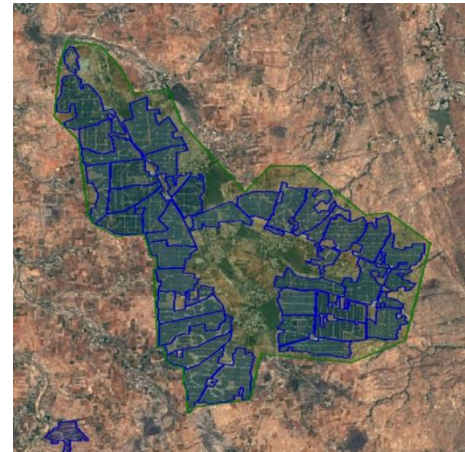
A new entry at #8, covering 92 sq.km. of semi-desert in the Mori Kazakh district of Changji Hui prefecture of China's Xinjiang Province is this solar park to the north of the town of [Danangouxiang](#).

The current capacity of its 13 plants is just over 1 GW, and it has sufficient space to at least double in size in future years.

#9. Pavagada Solar Park 1.0 GW (4)

Located on some 80 sq.km of low grade agricultural land in Karnataka state in India, to the north-east of the city of Pavagada, [this solar park](#) is now largely complete with its 19 plants giving a combined capacity of 1 GW_{AC}.

The solar park was sponsored by Karnataka Renewable Energy Development Limited (KREDL) and the off-taker for most of its output is India's National Thermal Power Corporation (NTPC)



#10. Haixi Delingha 0.97 GW (3)



[Delingha Solar Park](#) is located in the Haixi Prefecture, and is the third on this list in Qinghai Province.

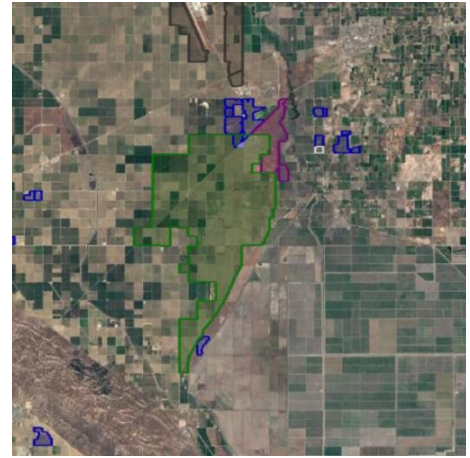
It houses about 40 projects with a combined capacity of over 1,000 MW. This includes 3 CSP plants together delivering about 200 MW (edged in red on this aerial view).

Plants now in construction will take the capacity over 1 GW, while Delingha Solar Park has enough site area for an eventual capacity of at least 2 GW.

#35 Westlands Solar Enterprize Zone 0.02 GW (-)

The highest US solar park on the list, the Dry Lake Solar Enterprize zone is at #20. Way below even that, Westlands currently has only one small plant in service. However, most of its ten plants are now in construction, and it will reach 1.5 GW when they are all complete.

The [Westlands Zone](#) covers 120 sq.km of mainly agricultural land in the San Joaquin Valley, south of Fresno, California. There are also several existing solar power plants in the vicinity.



Acknowledgements and terminology

The term 'solar **plant**' is used for an individual project that has been developed by a single developer or consortium. The largest of these were listed in [the previous blog](#). Where, as described in this blog, multiple plants are co-located in a discrete area under the coordination of an identified agency, this is called a **solar park**. And I use the word **cluster** where multiple solar farms are co-located in an area without formal coordination.

Image Credits: The satellite views are from Google Earth, using imagery from Airbus, CNES, Copernicus, Digital Globe and Landsat. In these shots, individual **plants** are highlighted in blue (if PV, or red if CSP), with **solar parks** in green. Colour coding on [Wiki-Solar's maps](#) is similar.

Also for consistency, all capacities are quoted in MW_{AC} to allow direct comparison between PV and CSP plants (and other forms of generation). Readers will be aware that the DC peak capacity of PV plants is typically ~25% higher than the rated AC capacity, quoted here.

The final blog in a couple of weeks' time will identify the world's biggest **clusters**.



Philip Wolfe has been active in the renewables arena since the 1970s and is the founder of Wiki-Solar. His [book on utility-scale solar](#) was published in 2012 and one on [the early years of the terrestrial PV sector](#) was published in 2018.