Thermal energy storage mongolia

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In a solar energy record for round-the-clock power generation, Mongolia’s Wulate 100MW trough CSP project ran continuously for 12 days, generating pure solar energy without batteries; due to the thermal energy storage in CSP. (How Concentrated Solar Power (CSP) works). In a CSP plant, mirrors create heat from sunlight and the heat is stored thermally and runs a thermal power plant.

Wulate began operation on January 8, 2022. The 100 MW plant generated 300,000 MWh of solar energy in its first year of operation. Records obtained by China’s Solar Thermal Alliance show that during that time; from June 4th to June 15th, 2022, and even under overcast skies for six of those days, continuous power generation round the clock was achieved for all 12 days. The total power generation of over 22,000 MWh during that period was at a maximum power generation of 106 MW.

The project, one of China’s trough CSP projects in its pilot program, (listed among the pilot projects as the Urat project) includes ten hours of thermal energy storage so it can generate solar energy through the night. All of the Chinese CSP projects, both the pilot projects and the 30 new ones underway as of 2023, include thermal storage. (How CSP thermal energy storage works)

Note: The Wulate project is also known as the Urat project. (many CSP projects are known by regional or nearby town names) It is one of the two CSP projects using parabolic trough technology listed here in China’s first round of pilot projects.

China has an unusual energy requirement that needs more 24-hour power than western nations. This is due to a higher percentage of load from overnight factory operations, according to a study in Nature of China’s cost to decarbonize covered recently here at SolarPACES. Supplying this load from solar energy helps China decarbonize its energy use at low cost. This is why China has emphasized building CSP in concert with PV and wind. CSP enables thermally stored solar energy.

Located in inner Mongolia at a high latitude of 41.5 degrees, Wulate is the first CSP project to achieve full operation at this latitude in China, the report states. The operating efficiency of the locally produced trough solar collector exceeded expectations for such a high latitude.

CSIC says that the operating efficiency of the domestic trough collector exceeded its expectations. CSIC also claims the world record for the shortest construction and commissioning period, however, this data was not provided by the reporter at China’s Solar Thermal Alliance. The firm notes that it also managed a world record short time for injecting the heat transfer fluid, with 570 tons inserted in just one day.

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This article, based on the report "Renewable Energy Solutions for Heating Systems in Mongolia--Developing a Strategic Heating Plan, 2023," prepared by IRENA, gives insight into Mongolia’s energy and climate challenges in the green transition. At the same time, recommendations are also given on how renewable energy (RE) can be implemented in the district heating (DH) sector.

The strategic heating plan indicates that it"s possible to reduce the emission of CO2 by up to 93% in 2050 compared to the present level – a challenging task but not impossible.

A strategic heating plan (SHP) is a techno-economic assessment that shows how municipalities, districts, cities, or countries can transform their heat supply from fossil-based sources by integrating RE resources.

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