Concentrated solar power news

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Dismissed by many in the solar industry as an overly complex, outdated technology, concentrated solar power (CSP) is set for a comeback thanks to a scaled-down, modular approach.

Scaling up CSP will bridge the gap caused by intermittent-generation PV and wind projects to help power the world"s most populous country with reliable, affordable, continuous renewable energy.

Rajan Varshney, deputy managing director of the National Thermal Power Corporation, India"s largest state-owned utility company said recently, "Now is the right time for CSP ... As PV and wind capacity increases, increasingly more and more coal-based power will be required to make it firm and to supply electricity when the sun is not there. So by increasing PV, we cannot avoid coal unless we install CSP plus storage in Gujarat and Rajasthan."

While previous installations were massive, complex, custom-engineered, and not replicable, my company, 247Solar, has obtained finance for a modular version that solves for these challenges.

Our version operates on superheated air at normal atmospheric pressure. It stores energy using simple materials, not molten salt, and it can be mass-produced in 400 kW units for economies of scale.

The model shows promise to greatly shorten project cycles and resume the dramatic CSP cost reductions achieved in its early years and which slowed as the older technology matured.

Around-the-clock power demand has been rising because of growth in emerging economies and is accelerating due to data centers, cryptocurrency, and artificial intelligence (AI). As we move to electrify with electric vehicles, heat pumps, and industrial heat, CSP emerges as a viable solution to address those needs and provide continuous power.

Grid operators continue to grapple with the variability of photovoltaic and wind energy. Wind, if it blows at night, can help balance daytime solar but wind is much more variable than sunshine and requires long-distance, high-voltage lines to get to market, which can add cost and time to wind farm deployment.

Even large doses of lithium-ion batteries - meant to handle morning and evening peak loads, as gas peaker plants did before them - are nowhere near enough to store the energy it would take to keep the grid powered through the night and during bad weather, as coal plants have. Batteries may also feature conflict minerals, unlike our thermal energy storage systems.

Concentrated solar has returned to projects that will pair it with PV to extend power output into the night, reducing overall LCOE by harnessing synergies between the two technologies.

Some of the high-profile early efforts at CSP got many things right, such as Abengoa Solar"s Solana plant near Phoenix, launched in 2013, or BrightSource"s Ivanpah plant in California, the world’s largest solar thermal site at the time, also in 2013.

Initial CSP plants focused the sun"s heat on a single point, reaching temperatures above 530 degrees Celsius. Our system pushes that limit to around 1,000 degrees Celsius.

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