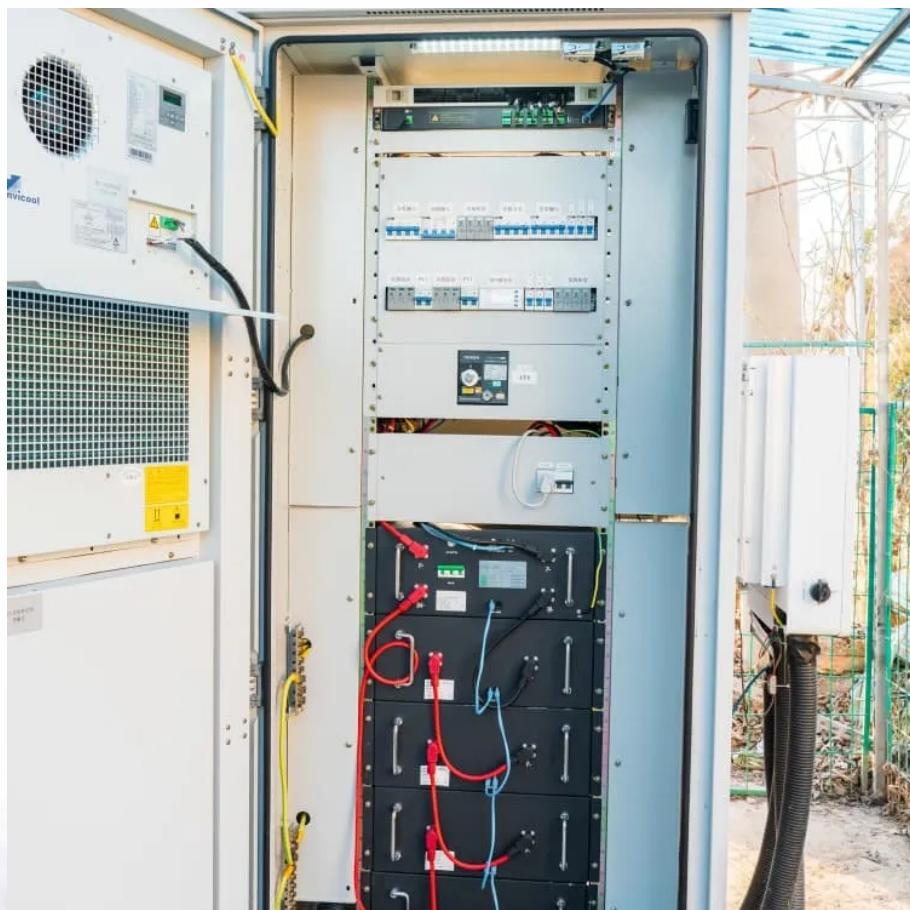




BUHLE POWER

25kW Photovoltaic Energy Storage Container for Cement Plants





Overview

Can a solar power system save CO2 in cement industry?

Concentrated solar power system is designed for cement industry. Substitution of required thermal energy ranging from 100% to 50% is studied. 7600 heliostats with 570 ha land required for 50% conventional energy replacement with solar energy. Selected conventional cement plant could save 419 thousand tons of CO₂ annually.

Can a solar cement plant run continuously?

There is no way that a solar cement plant can run continuously throughout the whole solar day. Therefore, several assumptions/constraints and modifications are considered and included in this model. The model is considered a solar calciner, constructed and tested at the German Aerospace Centre (DLR).

How calcined meal is used in a solar cement plant?

Solar cement plant operation during the day with a solar multiple (SM) > 1. Once more, the storage or conventional calciner makes up the difference between the generated calcined material and the design point. After the solar reactor achieves its optimum value, the calcined meal is immediately provided for the subsequent process.

How to run solar reactor for calcination of raw material in cement production?

Solar and thermal energy needed to run the solar reactor for the calcination of raw material in cement production using a heat balance equation is as follows:
Solar incident power on the solar reactor (Gonzalez and Flamant, 2013): (7) $Q_{SR} = Q_r \times n + Q_{hrm} - \% Q_I$
The mirror surface needed: (8) $S_{mirror} = Q_{SR} \eta S_{FDN}$



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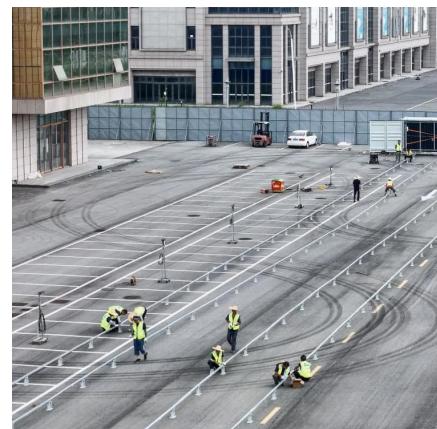
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