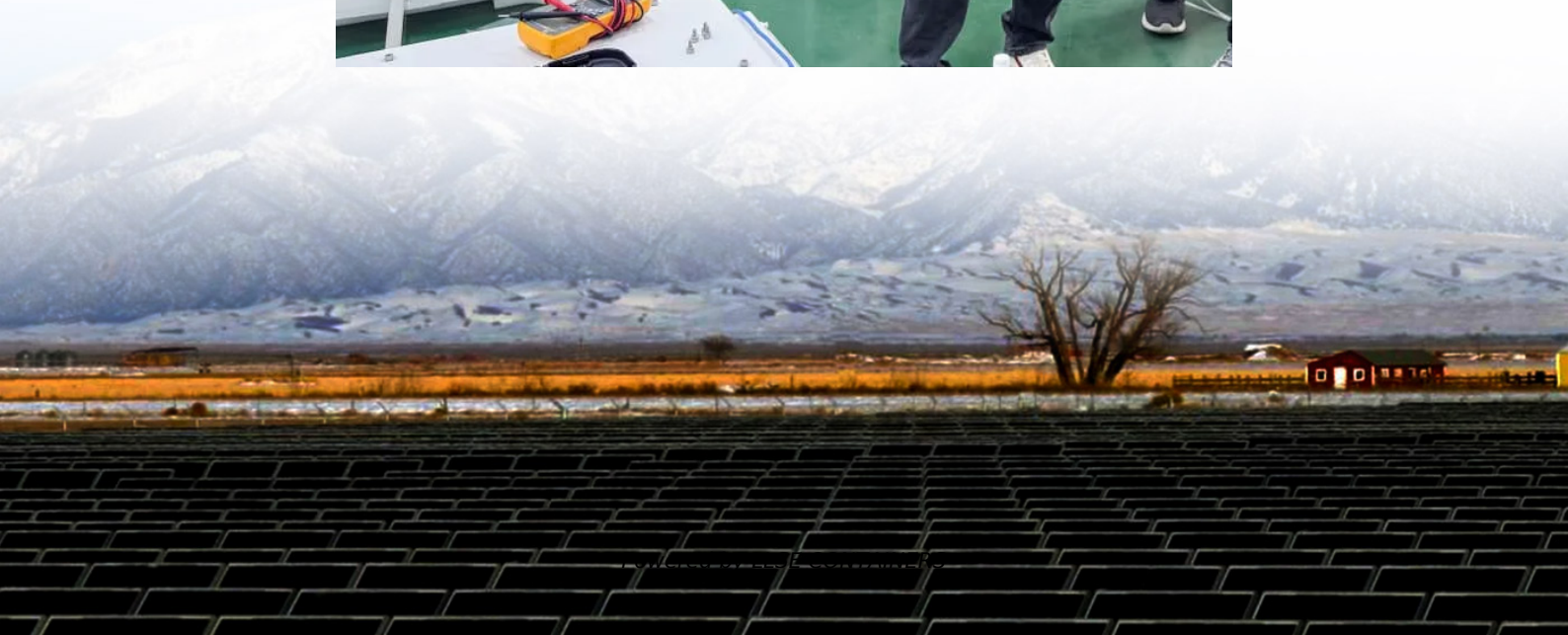


15kW Photovoltaic Container for Cement Plants





Overview

This work describes the implementation of concentrated solar energy for the calcination process in cement production. Approach used for providing solar energy includes the utilisation of a solar tower sy.

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).

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.

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) $Q_{SR} = Q_{rxn} + Q_{hrm} - \% Q_{loss}$ The mirror surface needed: (8) $S_{mirror} = \frac{Q_{SR}}{\eta_{SF} DNI}$.

Can solar energy be used in cement manufacturing?

Gonzalez and Flamant (2013) designed a hybrid model that uses solar and fossil fuel energy to fulfill the thermal energy requirement for cement manufacturing. Concentrated solar thermal (CST) is a potential replacement for 40%–100% of the thermal energy needed in a conventional cement plant.



15kW Photovoltaic Container for Cement Plants

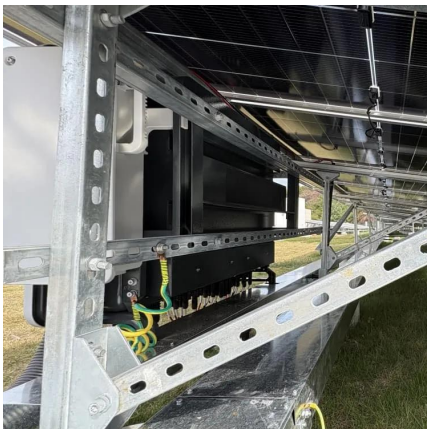


[Design of solar cement plant for supplying thermal energy in cement](#)

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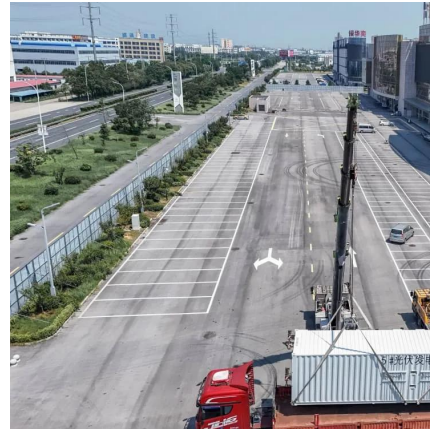
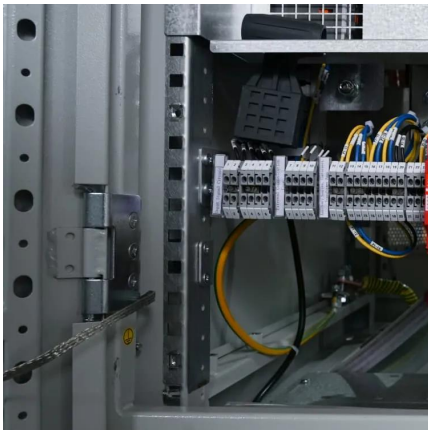
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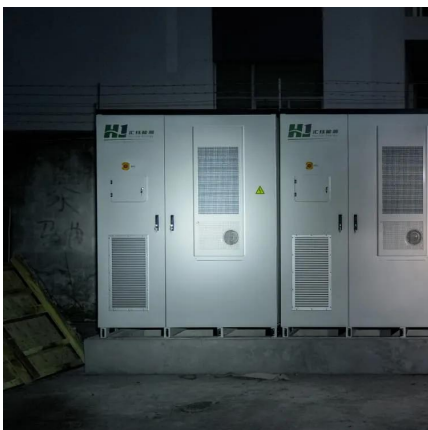


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