

# **High-efficiency solar-powered containers used in cement plants**





## Overview

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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 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.

Can solar clinker be used for cement production?

For the first time ever, CEMEX and Synhelion successfully connected the clinker production process with the Synhelion solar receiver, producing solar clinker. This revolutionary innovation is an initial step to develop fully solar-driven cement plants.

Which cement plant is used for solar thermal application?

Location and DNI availability of the investigated plant A conventional cement plant (Kotputli Cement Works (KCW), an UltraTech Cement Limited manufacturing unit) at Kotputli, Jaipur, Rajasthan, was investigated for solar thermal application.

Can a solar power system save CO<sub>2</sub> 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 CO<sub>2</sub> annually.



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### [CO2 pollution capture and removal from thermal and cement ...](#)

Jul 28, 2025 · For the cement and power industries, solar-powered carbon capture is an attractive decarbonization approach that uses renewable energy to increase the sustainability and ...

### [Towards decarbonization of cement industry: a critical review ...](#)

Jul 4, 2025 · In terms of total energy use, cement manufacturing accounts for two-thirds of the total energy use in the production of non-metallic materials.



### [CEMEX and Synhelion achieve breakthrough in cement ...](#)

Feb 2, 2022 · CEMEX and Synhelion announced today the successful production of the world's first solar clinker, the key component of cement, a significant step towards developing fully ...



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

Nov 10, 2023 · This work describes the implementation of concentrated solar energy for the calcination process in cement production. Approach used for providing solar energy



includes ...



### Cement Industry Solar Update - Cement Optimized

Oct 25, 2023 · This marks a significant milestone in the companies' journey toward the world's first fully solar-powered cement plant. An early 2022 energy lab demonstration in Spain saw ...



### Decarbonizing Cement Production Using Concentrated Solar ...

Sep 4, 2025 · The negative trajectory for concentrated solar thermal in cement production is a story of fragmented efforts and a failure of industrial imagination. In this scenario, CST for ...



### Greening the Concrete Jungle: Solarizing Cement Factories

An innovative and efficient solar power plant solution has been developed for cement factories. On an annual basis, solar PV systems in cement plants may save 22,941 tonnes of CO<sub>2</sub>.







### Producing cement with solar energy

Mar 2, 2022 · This is where the CemSol project comes in, short for "solar production of cement with integrated CO<sub>2</sub> capture". The team of scientists is developing a process in which the ...



### Concentrating Solar Power for Cement Decarbonization

Aug 20, 2024 · Concentrating Solar Power for Cement Decarbonization Solar-Thermal Mixed-Media Enhancement and Decarbonization of Clinker Formation (Solar MEAD)

### A pathway to decarbonizing cement manufacturing via solar ...

Dec 2, 2025 · The cement industry, a foundation of infrastructure development, is responsible for nearly 7 % of global CO<sub>2</sub> emissions, highlighting an urgent need for scalable decarbonization ...



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