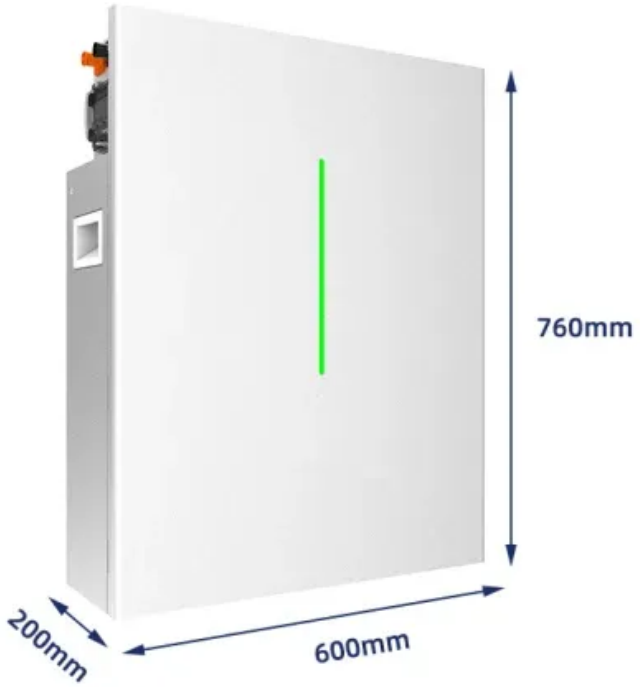
Solar Energy South Africa

Uses of large particle solar power generation



Overview

Can solid particles be used in solar receiver technology?

Initially, the application of solid particles in solar receiver technology is to obtain high temperature gas, instead of high temperature solid particles. In this concept, the solid particles are enclosed in a solar receiver and transfer the absorbed heat to the inlet gas stream.

How do solar power plants work?

The heat can then be used to create steam to drive a turbine to produce electrical power or used as industrial process heat. Concentrating solar power plants built since 2018 integrate thermal energy storage systems to generate electricity during cloudy periods or hours after sunset or before sunrise.

Which material is suitable for a solar receiver?

Solid particles are generally considered to be the most suitable heat transfer fluid (HTF) and thermal energy storage (TES) materials for the next-generation concentrated solar power (CSP) plant. The operating temperature of the solar receiver can be raised to exceed 800°C by the application of appropriate solid particles.

How does concentrated solar power work?

The working principle of concentrated (or concentrating) solar power is very simple: direct solar radiation is concentrated in order to obtain high temperature (approximately between 500 and 1000 °C) thermal energy that is transformed into electrical energy .

How does solar energy work?

The concentrated solar energy irradiates to the collector tube wall while the particles move from the bottom to the top under the transportation of gas to absorb the heat from the wall and then heated up to a certain temperature .

How to improve solar electricity and power cycle?

According to the basic principles of Carnot's theorem, the power cycle efficiency η power cycle can be increased by raising the turbine inlet temperature. Thus, the selection of HTF in the solar receiver system is essential to improve η solar − electricity and η power cycle .

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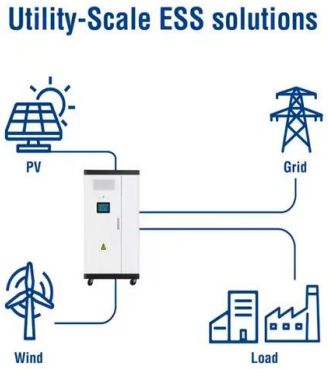
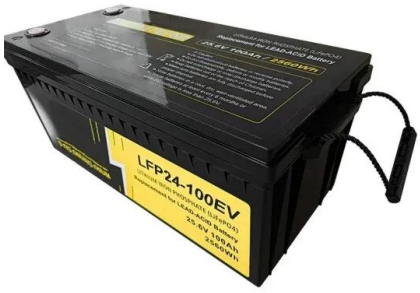


Solid particle solar receivers in the next-generation concentrated

concentrated solar power, large-scale development prospects, particle flow characteristics, solid particle solar receiver, thermal performance 1 , INTRODUCTION Due to the intermittent nature ...

How Concentrated Solar Power Works

All concentrating solar power (CSP) technologies use a mirror configuration to concentrate the sun's light energy onto a receiver and convert it into heat. The heat can then be used to create steam to drive a turbine to produce electrical ...



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