

Are solar chimney power plants a reliable source of renewable electricity?

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Author to whom correspondence should be addressed. This research presents a comprehensive review of solar chimney power plants (SCPP) as a reliable source of renewable electricity generation.

What is solar chimney power plant?

The present paper presents an overview of the main characteristics of a novel kind of solar thermal application called solar chimney power plant. It is a technology of electric power generation using solar energy by employing basic physics that when air is heated it rises.

What is solar chimney technology for power generation?

Solar chimney technology for power generation is one of the solar energy harvesting techniques where the direct and dispersed solar radiations are absorbed in the solar chimney power plant. The effectiveness of solar chimneys has been proven for power generation, and it is a promising approach to future energy generation plans.

Can solar thermal energy storage improve the performance of a chimney power plant?

The present paper is compiling most of the reported attempts to enhance the performance of the solar chimney power plant. The conclusion drawn is that the system performance can be enhanced considerably via integration with another source of thermal energy, or by using efficient solar thermal energy storages.

How to design a solar chimney power plant?

They demonstrated that the diameter and height of the chimney are the most important factors in the design of solar chimney power plant. Many researchers investigated the size and angle of the chimney and collector. It is better to suggest some algorithm optimization like PSO, MDO and hybrid methods to improve the power plant.

How does a chimney design affect the performance of solar power plants?

The design parameters affect the performance of solar chimney power plants as much as the geometric parameters. This situation was understood from the slope of the collector. Similarly, the chimney design affects the performance of the system.

In this article, experimental research on solar chimneys for ventilation is reviewed. The aim of this work is to identify parameters that have been experimentally tested so far to determine

where \dot{m} is the air mass flow rate (kg/s), \dot{Q}_a is the absorbed solar radiation excluding the thermal losses (W/m²), A_c is the collector area (m²), and h_1 and h_2 are the enthalpy of air at collector inlet ...

Solar chimney is one of the solar energy methods that can be considered as the best option for electricity generation. In this review article, solar chimney is reviewed in order ...

In this review article, the potential of solar chimney technologies for building ventilation, power generation and potable water generation in sole, hybrid and poly-generation ...

of their conceptual wind tower design for power generation in residential and commercial applications. While using a wind catcher for passive cooling, we may have regions within the ...

power plants for power generation and to take in consideration a case study for Iraq weather in Kirkuk city in the north of Iraq. To achieve this, a three-dimensional (3-D) simulation for the ...

A novel solar power plant concept is presented, based on the use of a coupled network of hybrid solar-dish micro gas-turbines, driving a centralized heat recovery steam generator and steam-cycle ...

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