Assessment of solar-coal hybrid electricity power generating systems

What are the advantages of a solar-coal thermochemical hybrid power generation system?
A solar-coal thermochemical hybrid power generation system is proposed. Net power generation efficiency and exergy efficiency can reach 53.06 % and 52.24 %. The chemical energy of syngas increased by approximately 29.70 % to 851.57 MW. The exergy destruction of the fuel conversion process is decreased by about 10.36 %.

Is supercritical water gasification suitable for solar-coal thermochemical hybrid power generation?
In this paper,a solar-coal thermochemical hybrid power generation system based on supercritical water gasification is proposed,and the feature is that the low gasification temperature of 650 °C makes it feasibleto use concentrated solar energy to provide reaction heat for the gasification process.

What is coal gasification?
Coal gasification is a thermochemical conversion processthat can be used to produce clean fuels ,and the thermochemical complementarity of solar energy and coal based on coal gasification is a promising research direction and is developing rapidly.

What is supercritical water coal gasification?
Supercritical water coal gasification (SWCG) is generally considered as the most promising technology for clean and efficient conversion and utilization of coalat present ,and can be applied to hydrogen production ,methane production ,and power generation ,.

Comparative Performance Assessment of a Hybrid Solar-Coal Power Plant Baloda Sunil1 & Manoj S. Soni1 Received: 30 March 2018/Revised: 15 June 2018/Accepted: ...

Wind and solar energy as hybrid energy sources are thought to be promising in electric generation technology. Hybrid Power Plants can also be used to address the issue of limited electrical energy ...

Integrating solar energy with existing or new fossil fuel based power plants could reduce the cost of stand-alone solar thermal power stations, reduce CO2 emissions and ...

In this paper, a solar-coal thermochemical hybrid power generation system based on supercritical water gasification is proposed, and the feature is that the low gasification ...

Performance of the 300 MW SCHPG system in the nominal and part-load condition is analyzed under three different integration mechanisms. Numerical simulation of 300 MW SCHPG ...

A detailed Life Cycle Assessment (LCA) "from cradle to grave" is performed to a solar combined cooling, heating and power (S-CCHP) system that provides space heating, ...

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Agajie, T. F. et al. Optimal design and mathematical modeling of hybrid solar PV-Biogas generator with energy storage power generation system in Multi-Objective function cases.

Journal of Energy and Power Engineering 6 (2012) 12-19 Assessment of Solar-Coal Hybrid Electricity Power Generating Systems Moses Tunde Oladiran1, Cheddi Kiravu1 ...

Clean Power 3 Quadrennia Technoog Reie 2015 TA 4: Hrid Nucear-Renewae Energ Systes Figure 4.K.2 General architecture for a thermally coupled nuclear renewable ...

The power output of hybrid solar-coal plant is augmented in power boosting mode when first-stage extraction steam replaced by solar energy is allowed to expand further in ...

Botswana currently depends on electricity generated from coal-based power plant or electricity supplied from the border in South Africa. The country has good reserves of coal ...

Solar-coal hybrid power generation (SCHPG) system is one of the interesting solutions for solar power generation. This research aims to find a more viable integration mechanism of solar energy into a coal-fired thermal power plant in ...

From the perspective of energy resource distribution, Northwest China, Tibet Autonomous Region, Inner Mongolia Autonomous Region, and Northeast China are rich in ...

The footprint of concentrated solar power (CSP) technology in the Indian energy mix is limited since the country mostly receives moderate direct normal irradiance (DNI) ...

The efficiency (? PV) of a solar PV system, indicating the ratio of converted solar energy into electrical energy, can be calculated using equation [10]: (4) ? P V = P max / P i n c ...

substitute for a given amount of fossil fuel generation. This project uses lifecycle assessment of renewable electricity generation technologies to quantify the input ...

The paper presents two conceptual coal-fired power station designs in which a solar sub-system augments heat to the feed heaters or to the boiler. The thermal and economic analyses ...

Performance of the 300 MW SCHPG system in the nominal and part-load condition is analyzed under three different integration mechanisms. Numerical simulation of 300 MW SCHPG system is investigated under four ...

Nixon et al. [7] assessed the feasibility of hybrid solar-biomass power plants in India for various applications

including tri-generation, electricity generation and process heat. The ...

The power output of hybrid solar-coal plant is augmented in power boosting mode when first-stage extraction steam replaced by solar energy is allowed to expand further in Rankine cycle.

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