A new solar energy and biomass-based distributed energy system using H2O/CO2 hybrid gasification is proposed, and their complementarity to enhance the system"s energy efficiency is investigated and shown. In the system, concentrated solar energy is used to provide heat for biomass gasification; two gasifying agents (H2O and CO2) are adopted to ...

The basis of solar aided power generation (SAPG) technology/concept, is to use solar thermal energy to replace the bled-off steam in regenerative Rankine power cycle. ... Qin J.Y. Hu Eric Gus Nathan 2011 "A modified thermodynamic model ...

Solar photovoltaic (PV) power generation is the process of converting energy from the sun into electricity using solar panels. Solar panels, also called PV panels, are combined into arrays in a PV system. PV systems can also be installed in grid-connected or off-grid (stand-alone) configurations. The basic components of these two configurations ...

@article{Han2024PolyethyleneGA, title={Polyethylene glycol/polypyrrole aerogel shape-stabilized phase change material for solar-thermal energy storage and thermoelectric power generation}, author={Shenghui Han and Feng Xiong and Mulin Qin and Zhenghui Shen and Haiwei Han and Yong-Zhen Jin and Ali Usman and Yonggang Wang and Ruiqin Zhong ...

For the efficient use of solar and fuels and to improve the supply-demand matching performance in combined heat and power (CHP) systems, this paper proposes a hybrid solar/methanol energy system integrating solar/exhaust thermochemical and thermal energy storage. The proposed system includes parabolic trough solar collectors (PTSC), a ...

Photovoltaic (PV) power generation is the main method in the utilization of solar energy, which uses solar cells (SCs) to directly convert solar energy into power through the PV effect. However, the application and development of SCs are still facing several difficulties, such as high cost, relatively low efficiency, and greater influence from external conditions.

thin-lm cells, third-generation organic solar cells, and dye-sensitized solar cells, among others [, 717, 18]. It has been reported that photovoltaic power could contribute signicantly to emission reduction potential by 2050 [19]. However, photovoltaic systems still suer from drawbacks such as low power generation eciency and high cost [20, 21].

Renewable energy plays a significant role in achieving energy savings and emission reduction. As a sustainable and environmental friendly renewable energy power technology, concentrated solar power (CSP) integrates power generation and energy storage to ensure the smooth operation of the power system. However,

the cost of CSP is an obstacle ...

Solar Aided Power Generation is a technology in which low grade solar thermal energy is used to displace the high grade heat of the extraction steam in a regenerative Rankine cycle power plant for feedwater preheating purpose. The displaced extraction steam can then expand further in the steam turbine to generate power. ... Qin and Hu [20 ...

Due to the abundance of solar energy, considered a safe and reliable renewable energy source, [6, 7] a process known as solar steam generation has emerged as a practical approach to purifying seawater. Specifically, in a method known as interfacial solar-driven evaporation, heat is concentrated at the water-air interface using a photothermal ...

Research on Wind-Solar-Hydro power generation system has gradually become a hot research topic. In this paper, a large-scale hydropower station in southwestern China and its surrounding wind fields and solar fields are taken as examples to establish an optimal scheduling model with the objectives of maximizing system total power generation ...

Semantic Scholar extracted view of "Solar aided power generation: A review" by Jiyun Qin et al. Skip to search form Skip to main content Skip to account menu ... @article{Qin2020SolarAP, title={Solar aided power generation: A review}, author={Jiyun Qin and Eric Hu and Xiao-hua Li}, journal={Energy and Built Environment}, year={2020}, url={https ...

Qin et al. [33] compared the integration of concentrating and nonconcentrating solar collectors within a power plant; the latter exhibits a higher net land-based solar-to-electricity efficiency than the former.. ... Solar Aided Power Generation (SAPG) is the most efficient and economic ways to hybridise solar thermal energy and a fossil fuel ...

For China, some researchers have also assessed the PV power generation potential. He et al. [43] utilized 10-year hourly solar irradiation data from 2001 to 2010 from 200 representative locations to develop provincial solar availability profiles was found that the potential solar output of China could reach approximately 14 PWh and 130 PWh in the lower ...

Thermoelectric materials can convert heat into electricity or be used as the basis of cooling devices. Qin et al. found that doping a tin selenide thermoelectric material with lead and sodium improved the room temperature thermoelectric properties, an effect created by manipulation of the electronic bands.The authors showed that the material could be used not only for power ...

Semantic Scholar extracted view of "Should China focus on the distributed development of wind and solar photovoltaic power generation? A comparative study" by Bing Sun et al. Skip to search form Skip to ... {Bing Sun and Yu Yixin and Chao Qin}, journal={Applied Energy}, year={2017}, volume={185}, pages={421-439}, url={https://api ...

Major wind and solar photovoltaic (PV) power generation are being developed in China. The following 2 development schemes operate in parallel: large-scale wind and solar PV power is generated by ...

Meanwhile, power generation accounts for approximately 36% of energy-related carbon dioxide (CO 2) emissions across advanced economies in 2019, placing the power sector among the world"s largest ...

Solar Aided Power Generation (SAPG) is one of cost-effective methodologies of integrating solar heat into fossil fuel fired power plant. For such system, solar heat used to displace extraction steam to high grade extraction steam is the best choice. ... Qin et al. named this strategy as non-displaced extraction steam strategy, and proposed two ...

Literature (Tan et al., 2021) proposes a wind-solar-water hybrid power generation system, which uses different energy sources to complement each other, reduces the impact of wind and solar fluctuations on electric energy, and improves the quality of power output from the grid. Since the influencing factors in the multi-energy complementary system are ...

Should China focus on the distributed development of wind and solar photovoltaic power generation? A comparative study. Bing Sun, Yixin Yu and Chao Qin. Applied Energy, 2017, vol. 185, issue P1, 439 pages . Abstract: Major wind and solar photovoltaic (PV) power generation are being developed in China. The following 2 development schemes operate in parallel: large ...

energy power generation (REPG), is necessary. Solar PV power gen-eration and onshore wind power generation are mature and eco-nomical REPG technologies. Thus, only solar PV power and onshore wind power are considered here. The renewable energy electricity integration ratio (REIR) refers to the ratio of the annual

Concentrating photovoltaic (CPV) technology is a promising approach for collecting solar energy and converting it into electricity through photovoltaic cells, with high conversion efficiency. Compared to conventional flat panel photovoltaic systems, CPV systems use concentrators solar energy from a larger area into a smaller one, resulting in a higher ...

When used as a solar-thermal conversion material in a solar thermoelectric power generation system and thermal therapy, a long-term stable output voltage of 318 mV and temperature of 40-50 °C are generated, respectively, achieving effective conversion from renewable solar energy to applicable electricity and heat energy.

The global capacity of renewable sources of energy is 2357 GW in 2019 with a rise of 176 GW from 2018. Among them, solar energy is dominant with a total installed capacity of 623 GW in 2019 and 55% of the newly ...

DOI: 10.1016/J.ENCONMAN.2016.07.015 Corpus ID: 113974467; The performance of a Solar Aided Power Generation plant with diverse "configuration-operation" combinations @article{Qin2016ThePO, title={The performance of a Solar Aided Power Generation plant with diverse "configuration-operation" combinations}, author={Jiyun Qin and Eric Hu and Graham J. ...

Solar Aided Power Generation is a solar thermal hybrid power system, in which solar heat is used to replace the heat of extraction steam for a Rankine cycle power plant by preheating the power plant feedwater to boiler. ... Qin et al. proposed two concepts of SAPG plant"s operation strategies, which are replaced extraction steam operation ...

DOI: 10.1016/j.applthermaleng.2022.118659 Corpus ID: 248871628; A strategy to flexibly operate a Solar Aided Power Generation plant for wide irradiation conditions @article{Qin2022AST, title={A strategy to flexibly operate a Solar Aided Power Generation plant for wide irradiation conditions}, author={Jiyun Qin and Qinglei Zhang and Z. Liu and Eric Hu and Hongsheng ...

Many researchers have conducted deep studies on solar aided coal-fired power plant. In 1975, Zoschak et al. [11] first proposed the concept of hybridization of solar thermal energy and fossil fuels as well as seven integration schemes of solar thermal energy and coal-fired power plant. These seven schemes were applied to an 800 MW coal-fired power plant to ...

It is seen from Fig. 11 that if 800 kmol/h hydrogen is added into the poly-generation system, the construction of the solar field for power generation and the alkaline electrolysis system for hydrogen production totally costs 682.39 M$ fixed capital investment. In this case, the overall fixed capital investment of the hydrogen added system is 3.37 times ...

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