Solar Energy

Solar container cascade recovery cycle

Overview

The multi-stage solar still water desalination system was designed to recover latent heat from evaporation and condensation processes in four stages. Heat losses in solar stills are high, which has led to a decrease in their thermal efficiency. Also, the production of these devices is limited to the presence of the sun, and their production stops during cloudy hours or at night. To solve these problems, in this experimental study, two cascade. A performance assessment of advanced sCO 2 Brayton cycles integrated with a concentrated solar power and waste heat recovery systems was conducted. Five advanced sCO 2 Brayton cycles are examined for the bottoming cycle: dual heater, dual expansion, cascade, partial recuperation, and Kimzey cycles. Many researchers have experimentally and theoretically studied fresh water productivity in solar stills. In this regard, water preheating can play a noticeable role in enhancing the productivity of solar stills. In the present study, in order to study the effect of water preheating at the inlet of. Optimal thermo-economic integration of renewable energy sources with multi-generation energy systems is a prime research topic today. The present study proposes a multi-criteria evaluation method of such integration, based on combined heating and power (CHP), and combined cooling and power (CCP).

Solar container cascade recovery cycle

Optimizing solar-driven multi-generation systems: A cascade heat

Due to the vast amount of solar power received by such systems, the production of significant waste heat ensues. Therefore, this study aims to propose and optimize a new cascade ...

Design of cascade analysis for renewable and waste heat recovery in ...

Design of cascade analysis for renewable and waste heat recovery in a solar thermal regeneration unit of a liquid desiccant dehumidification system Elaine Low a b

Performance Investigation of Supercritical CO2 Brayton Cycles in

Abstract. A performance assessment of advanced sCO2 Brayton cycles integrated with a concentrated solar power and waste heat recovery systems was conducted. Five advanced sCO2 ...

A case study of cascade supercritical CO2 power cycle for waste heat

Abstract and Figures Among the technological solutions that can be applied to waste heat recovery, the supercritical CO2 (sCO2) cycle

represents an innovative option.

Comprehensive reviews on technological and life cycle environmental

Refrigeration has significantly enhanced human well-being but comes with notable environmental impacts, particularly due to ozone-depleting substances and hydrofluorocarbons with ...

A case study of cascade supercritical CO2 power cycle for waste heat

Among the technological solutions that can be applied to waste heat recovery, the supercritical CO 2 (sCO 2) cycle represents an innovative option. This work studies the performance ...

Sustainable freshwater production using novel cascade solar still with

Heat losses in solar stills are high, which has led to a decrease in their thermal efficiency. Also, the production of these devices is limited to the presence of the sun, and their production stops ...

Thermodynamic analysis and optimization of a hybrid cascade

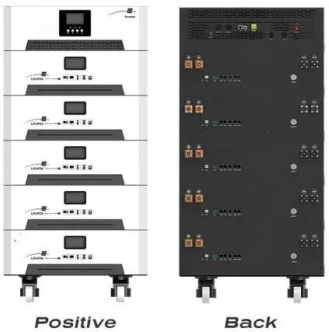
Abstract A hybrid cascade carbon dioxide cycle (HCCC) is proposed to recover the waste heat in this paper. In the HCCC, the top cycle uses the energy of the high-temperature flue ...

Thermodynamic and environmental assessment of a solar-assisted

Thermodynamic and environmental assessment of a solar-assisted Polygeneration system: Integrating carbon-enriched chemical looping hydrogen and a dead-ended solid oxide fuel cell with Cascade ...

Performance investigation of solar tower system using cascade

A novel solar power tower system that integrates with the cascade supercritical carbon dioxide Brayton-steam Rankine cycle is proposed to tackle the c...



Performance investigation of the solar power tower driven combined

ABSTRACT Current study examined the effect of solar power tower (SPT) design parameters (solar emittance, concentration ratio and heat transfer fluid velocity, solar irradiation) on ...

Design and analysis of an innovative concentrated solar power system

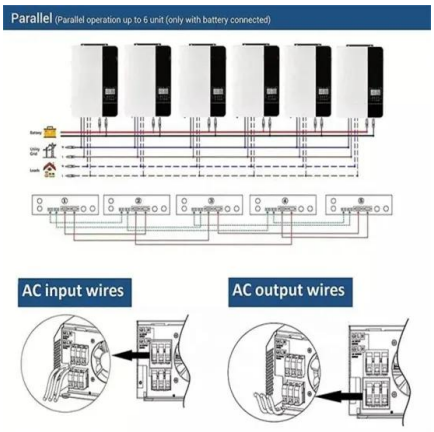
It has three features: two-phase water/steam as heat transfer fluid, two-tank water storage, and cascade organic Rankine cycle (CORC) with a mixing chamber as power block. Steam is ...

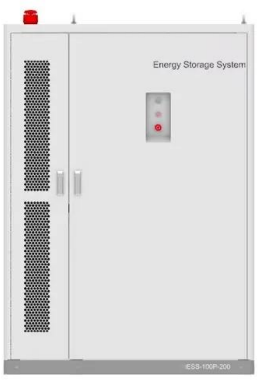
An innovative solar power tower system coupling double-reheaters ...

Double-reheaters are favorably employed in supercritical and ultra-supercritical Rankine cycle-driven units, but their application in subcritical cycles is rare. This paper proposes an ...

Thermodynamic and exergoenvironmental assessments of solar ...

A partial cooling supercritical carbon dioxide cycle is used in this study for the application of a solar power tower. Additionally, the organic Rankine cycle (ORC) is considered as a bottoming ...





Sustainable freshwater production using novel cascade solar still with

In this paper, a solar distillation unit with serpentine water paths over cascade steps is investigated experimentally. The unit operates with paraffin (PCM) and copper fins.

Optimizing solar-driven multi-generation systems: A cascade heat

The pursuit of an optimal solution for performance is essential in ensuring that a solar-driven multi-generation system functions efficiently. Due to the vast amount of solar power received ...

Design of steam condensation temperature for an innovative solar

An innovative solar thermal power generation system using cascade steam-organic Rankine cycle (SORC) and two-stage accumulators has recently been proposed. This system offers ...

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