

Can a solar energy driven ORC system be optimized simultaneously?

**Conclusions** This study investigates the optimal design and operation of a solar energy driven ORC system with a parabolic trough collector and a two-tank sensible thermal energy storage system. The energy storage system and the ORC system have been optimized simultaneously to achieve the best performance of the total system.

What is a solar ORC system?

The ORC system driven by solar energy generates round-the-clock stable power output. The integrated ORC system is optimized based on a simulation-based optimization framework. Optimal design and control strategy are identified.

How to maximize system efficiency of solar energy driven ORC power plant?

The system efficiency of the solar energy driven ORC system is maximized with the proposed optimal operation strategy. With the simulation-based optimization framework, the system efficiency of the recuperative ORC power plant with toluene as the working fluid is increased from 17.9% to 24.8% compared with a previous study in the literature.

How is a solar energy driven ORC power plant modeled?

An integrated model is developed in Matlab and Aspen HYSYS, which is a widely used process simulator, to obtain the optimal process design and control strategy of the solar energy driven ORC power plant. The thermal energy storage sub-system and the PTC sub-system are modeled in Matlab, while the ORC sub-system is simulated in Aspen HYSYS.

What are the applications of ORC power systems?

1. ORC applications and heat sources: ORC power systems are suitable for a broad range of different heat sources. Various applications can be found also in industry for waste heat recovery for both, stationary and mobile applications. 2.

Which solar energy technologies can power ORC?

Various solar energy technologies capable of powering ORC are investigated, including flat plate collectors, vacuum tube collectors, compound parabolic collectors, and parabolic trough collectors. The review places significant emphasis on the operating parameters of technology. 1. Introduction

Clean Energy Processes (CEP) Laboratory, Department of Chemical Engineering, Imperial College London, London, UK; This paper is concerned with the emergence and development of low-to-medium-grade ...

Downloadable (with restrictions)! This work investigates the behavior of a solar power generation system that

consists of a concentrated photovoltaic/thermal (CPV/T) system that utilizes an ...

111 energy storage sub-system, and an ORC power generation sub-system. The parabolic trough The parabolic trough 112 collector (PTC) was selected as the solar collector as it can heat the ...

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Energy storage becomes increasingly important in balancing electricity supply and demand due to the rise of intermittent power generation from renewable sources. The compressed air energy ...

In our study, the two-tank energy storage system, which can also be categorized as a direct and sensible thermal energy storage, is chosen as the TES system. In this study, the integrated ...

An Organic Rankine Cycle (ORC) system is a closed thermodynamic cycle used for power production from low to medium-high temperature heat sources ranging from 80 to 400°C and for small-medium applications at any temperature level. ...

